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# Tuberculosis in Animals: *Mycobacterium* bacilli that cause Devastating Zoonotic Diseases in many Animals

*Animal Welfare Information Center Series No. 2004-01*

January 2004

REVISED: December 2007

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**Jean Larson**  
**Animal Welfare Information Center**

**U.S. Department of Agriculture**  
**Agricultural Research Service**  
**National Agricultural Library**  
**10301 Baltimore Avenue**  
**Beltsville, MD 20705-2351**  
**Telephone: (301) 504-6212**  
**Fax: (301) 504-7125**

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## Introduction

**GENERAL.** There are many losses in the livestock industry, zoo animals, wildlife, and of course humans as a result of the bacterial disease called tuberculosis (TB). As described in the Eighth Edition of *The MERCK Veterinary Manual* <sup>1</sup>. “Tuberculosis is an infectious, granulomatous disease caused by acid-fast bacilli of the genus *Mycobacterium*.

Although commonly defined as a chronic, debilitating disease, TB occasionally assumes an acute, rapidly progressive course. The disease affects practically all species of vertebrates, and before control measures were adopted, was a major disease of man and domestic animals. Bovine TB is still a significant zoonotic disease in many parts of the world. Clinical signs and lesions are generally similar in the various species.”

The *Mycobacterium* family of bacteria causes a variety of disease scourges such as tuberculosis, leprosy, cervical lymphadenitis, a swimming pool granuloma, chronic pulmonary diseases, Johne's disease, etc.

There is a very broad range of species that are susceptible to the tuberculosis causing species. The main species of bacilli that cause disease are *Mycobacterium tuberculosis*, *Mycobacterium bovis*, and *Mycobacterium avium* complex. *M. tuberculosis* and *M. bovis* as they affect animals are the species most referenced in this document. Other species of the bacilli cause similar diseases in fish, turtles, etc. and they are included in this document. Since the topic of Johne's disease in cattle, caused by *Mycobacterium avium* subspecies *paratuberculosis*, is the topic of another Animal Welfare Information Center information resource, the articles dealing with this species are included here only if found in birds. In the literature cited below, there are articles detailing the various aspects of *Mycobacterium tuberculosis* and *Mycobacterium bovis* as they affect domestic and wild ruminants, ferrets, badgers, rodents, elephants, various birds, pigs, deer, coyotes, camels, pumas, fish, dogs, cats, non-human primates, and of course humans world-wide.

**THE DISEASE.** Tuberculosis is one of the oldest of the recognized diseases in humans and animals. Egyptian mummies show typical lesions of the disease. Ancient manuscripts indicate that the disease existed when humans began living in villages. Even the recognition by humans that contaminated carcasses should not be used for human consumption can be seen in “early Mosaic laws in the Talmud which classed any animal carcass showing adhesions between the lungs and the lining of the lung cavity as unsatisfactory for edible purposes.” <sup>2</sup>.

It was not until 1882, that the cause of the disease became known. Dr. Robert Koch, the noted German scientist, proved that a microorganism could be isolated from the characteristic tubercles that form during the typical TB disease process. The rod-shaped organism as seen under the microscope varies in size, from about 1 to 4 microns (about 6,000-16,000 laid end to end equals 1 inch). Koch showed that these same “rods” can cause the typical tuberculosis disease when inoculated into another animal. Although it was originally called Koch's bacillus, the organism was later given the scientific name of *Mycobacterium tuberculosis* as it is still known today.

The disease may be contracted in a variety of ways and affects many organs of the body. Most of the time, the bacilli are inhaled via infected droplets from an infected person's or animal's lungs, or by ingesting contaminated food, milk or water.

Once the bacilli get into a susceptible organism, a number of events occur which cause the characteristic disease. It generally starts in the areas where the exposure occurs. The lungs are often attacked, but other parts of the body can be affected. When it gets into the lymph system, it can travel to all parts of the body. Wherever the bacilli lodge, invader-fighting white blood cells are attracted to the bacilli invaders and attempt to ingest them. The bacillus have a waxy coating that is very resistant to the white cells attempts to digest it. The invader fighting cells then attempt to isolate bacilli inside a hard nodule and a “tubercle” is thus formed. If the wall of the tubercle is dense and effective in encapsulating all the mycobacterial bacteria, there will be little advancement of the disease and the tubercle may even calcify. But, if the bacilli are not completely contained, a spreading lesion will ensue. Bacilli may escape from the lesion and move to other parts of the body. Wherever invader cells lodge, the disease process starts over again. During

the process of the disease development and expansion, the animals become emaciated, lethargic, organs become damaged and the animal weakens and dies.

**DIAGNOSIS.** Tuberculous lesions can not always be seen or palpated, so clinical signs are not reliable for a diagnosis. The intradermal tuberculin test is still the most important diagnostic test for TB. Radiography is useful for imaging lesions in non-human primates and small animals. Discharges and sputum can be examined microscopically, but diagnosis other than the tuberculin test requires culturing tissue samples on selective media which can take 4-8 weeks. The intradermal test made from mycobacterial antigen is the one most used for large animals. A positive reaction includes skin swelling. The test is not perfect as there are cross reactions with other strains of mycobacteria and false negatives may occur under certain conditions. Current research efforts are trying to find improved diagnostic methods. An interferon based assay has recently been developed and has proven beneficial. Other tests are also being evaluated.

**CONTROL MEASURES.** The trend toward intensive agriculture has made control more difficult. Also, the presence of wild animals as reservoirs of the *Mycobacterium* (e.g. badgers in the UK, brush-tail possums in New Zealand, and white-tailed deer in the US) make it very difficult to eradicate the disease. In general, there are three approaches currently used to control the disease in domestic animals: 1) test for TB with the intradermal tuberculin test and either slaughter, 2) segregate or 3) treat with drugs. The culling of reacting presumed infected animals is the only assured approach to eradicating the disease. This is difficult where pastured animals are infected by exposure to diseased wild animals. Hygienic measures to reduce contamination of facilities is also useful. The use of drugs is discouraged due to exposure of humans to animals being treated, possible development of drug resistant strains, and the expense to producers. The efficacy of a live vaccine made from the attenuated strain of *Mycobacterium tuberculosis* BCG (Bacilli Calmette-Guerin) has proven variable and use of this vaccine may confound interpretation of current diagnostic tests. Improved vaccines are currently being evaluated in research trials.

Eradication of TB in animals has been a long term goal of the U. S. Department of Agriculture. The reader may be interested to note that a campaign to eradicate bovine tuberculosis in the United States was inaugurated as far back as May of 1917.<sup>2</sup> At that time, the “course of action was the testing with tuberculin of all the dairy and breeding cattle in this country. On November 1, 1940, about 23 ½ years later, all 3,071 counties in the US, and Territories of Puerto Rico, and the Virgin Islands, are rated as modified accredited areas, signifying that bovine tuberculosis among the cattle in such areas has been reduced to less than 0.5 %.” The campaign required approximately 232 million tuberculin tests and retests, and the slaughter of 3.8 million tuberculous animals. Most states have some incidence, Wight reports, but it is interesting that he also notes that human tuberculosis levels dropped as a result of reduction in the exposure to contaminated animals, meat and unpasteurized milk. In general, the eradication program has been successful and today, less than 0.002% of cattle are infected with *M. bovis*. However, the zoonotic potential of the disease is still an issue today in this country and more serious in many other countries.

Mycobacterial diseases seem to have been causing disease for eons and there does not seem to be anything in the modern arsenal of drugs and vaccines to stop it-- yet. Hopefully, some of the current research will finally yield some breakthroughs and the losses of animal and human life will be dramatically reduced in the not too distant future.

Resources used above:

1. Aiello, Susan E. and Asa Mays (eds.) *The Merck Veterinary Manual*, 8th edition. Whitehouse Station, N. J. The Merck & Co, Inc. 1998, p. 537-539.
2. Wight, A.E.; Lash, E.; O'Rear, H.M.; Crawford, A.B. **Important General Diseases Common to Several Species. Part 2. Tuberculosis and Its Eradication.** *Keeping Livestock Healthy*, Washington, D.C. U.S. Department of Agriculture. 1942 Yearbook of Agriculture.

I would like to thank Dr. W. Ray Waters of the USDA, Agricultural Research Service's, National Animal Disease Center in Ames, Iowa for his review and clarifying text changes of the introductory material in this publication.

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*Updated January 18, 2008*

# Bacteria

2007

Adjei, M.D.; Deck, J.; Heinze, T.M.; Freeman, J.P.; Williams, A.J.; Sutherland, J.B. **Identification of metabolites produced from N-phenylpiperazine by *Mycobacterium* spp.** *Journal of Industrial Microbiology and Biotechnology*. 2007 Mar; 34 (3): 219-224. ISSN: 1367-5435  
**URL:** <http://dx.doi.org/10.1007/s10295-006-0189-x>

**NAL Call Number:** QR53 .J68

**Abstract:** *Mycobacterium* sp. 7E1B1W and seven other mycobacterial strains known to degrade hydrocarbons were investigated to determine their ability to metabolize the piperazine ring, a substructure found in many drugs. Cultures were grown at 30degrees C in tryptic soy broth and dosed with 3.1 mM N-phenylpiperazine hydrochloride; samples were removed at intervals and extracted with ethyl acetate. Two metabolites were purified from each of the extracts by high-performance liquid chromatography; they were identified by mass spectrometry and superscript 1(BH nuclear magnetic resonance spectroscopy as N-(2-anilinoethyl)acetamide and N-acetyl-N'-phenylpiperazine. The results show that mycobacteria have the ability to acetylate piperazine rings and cleave carbon-nitrogen bonds.

**Descriptors:** *Mycobacterium* strains, ability to metabolize piperazine, broth culture, extracts via hplchromatography, acetylation of piperazine rings, cleavage of carbon-nitrogen bonds.

Chitra, M.A.; Subodh Kishore **Lipoarabinomannan for the serological diagnosis of bovine tuberculosis.** *Indian Veterinary Journal*. 2007; 84 (2): 123-126. ISSN: 0019-6479

**URL:** [www.indvetjournal.com](http://www.indvetjournal.com)

**NAL Call Number:** 41.8 IN2

**Descriptors:** cattle; lipoarabinomannan antigen; ELISA test; *Mycobacterium bovis* identification, optical density compared to other mycobacterial species, diagnostic test sensitivity, serodiagnosis in the field, compared to PPD, CCF, CSA antigens.

Denis, M.; Keen, D.L.; Parlane, N.A.; Storset, A.K.; Buddle, B.M. **Bovine natural killer cells restrict the replication of *Mycobacterium bovis* in bovine macrophages and enhance IL-12 release by infected macrophages.** *Tuberculosis*. 2007; 87 (1): 53-62. ISSN: 1472-9792

**URL:** <http://www.sciencedirect.com/science/journal/14729792>

**Descriptors:** blood monocyte-derived bovine macrophages, stimulated NK cells and release interleukin-2 (IL-2), natural killer cells, innate bovine resistance to virulent *M. bovis*, reduction of bacterial growth in macrophages.

Flynn, Robin J.; Mannion, Celine; Golden, Olwen; Hacariz, Orcun; Mulcahy, Grace. **Experimental *Fasciola hepatica* infection alters responses to tests used for diagnosis of bovine tuberculosis.** *Infection and Immunity (IAI)*. 2007 Mar; 75 (3): 1373-1381. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** *Fasciola hepatica* is a prevalent helminth parasite of livestock. Infection results in polarization of the host's immune response and generation of type 2 helper (Th2) immune responses, which are known to be inhibitory to Th1 responses. Bovine tuberculosis (BTB) is a bacterial disease of economic and zoonotic importance. Control policies for this disease rely on extensive annual testing and a test-and-slaughter policy. The correct diagnosis of BTB relies on cell-mediated immune responses. We established a model of coinfection of *F. hepatica* and *Mycobacterium bovis* BCG to examine the impact of helminth infection on correct diagnosis. We found the predictive capacity of tests to be compromised in coinfecting animals and that *F. hepatica* infection altered macrophage function. Interleukin-4 and gamma interferon expression in whole-blood lymphocytes restimulated in vitro with *M. bovis* antigen was also altered in coinfecting animals. These results raise the question of whether *F. hepatica* infection can affect the predictive capacity of tests for the diagnosis of BTB and possibly also influence susceptibility to BTB and other bacterial diseases. Further studies on the interplay between helminth infection and BTB are warranted.

**Descriptors:** livestock, *Fasciola hepatica*, liver fluke, *Mycobacterium bovis* BCG, co-infection of helminths and bacteria, question whether bovine tuberculosis testing compromised, suggest further studies.

Fujiwara, Nagatoshi; Nakata, Noboru; Maeda, Shinji; Naka, Takashi; Doe, Matsumi; Yano, Ikuya; Kobayashi, Kazuo. **Structural characterization of a specific glycopeptidolipid containing a novel N-acyl-deoxy sugar from *Mycobacterium intracellulare* serotype 7 and genetic analysis of its glycosylation pathway** *Journal of Bacteriology*. 2007; 189 (3): 1099-1108. ISSN: 0021-9193

**URL:** <http://jb.asm.org/>

**NAL Call Number:** 448.3 J82

**Descriptors:** *Mycobacterium avium*, *Mycobacterium intracellulare* complex (MAC) respiratory and lymphatic pathogen, humans and animals, produce polar glycopeptidolipids, serotype specific antigenicity, structural characterization, glycosylation pathway, serovars.

Gannon, B.W.; Hayes, C.M.; Roe, J.M. **Survival rate of airborne *Mycobacterium bovis*.** *Research in Veterinary Science*. 2007; 82 (2): 169-172. ISSN: 0034-5288

**URL:** <http://www.sciencedirect.com/science/journal/00345288>

**NAL Call Number:** 41.8 R312

**Descriptors:** survival time of aerosolized, *Mycobacterium bovis*, half life of 1.5 hours, airborne transmission, cattle infection, may be principle route of infection.

Gong, Qiang; Liu, Si Guo; Guo, She Ping; Wang, Chun Lai; Wang, Yong; Liu, Jian Dong; Zhao, Kun; Chi, Lei; Kong, Xian Gang. **Immunogenicity of DNA vaccine containing esat-6 gene or mpb70-mpb83 fusion gene from *Mycobacterium bovis*.** *Veterinary Science in China*. 2007; 37 (1): 61-66. ISSN: 1673-4696. Note: In Chinese with an English summary.

**URL:** <http://www.zgsyky.com/>

**Descriptors:** *Mycobacterium bovis* Vallee III, mycobacterial infections, DNA vaccine, fragments of esat-6 and mpb70-mpb83, antigenicity, cloning vectors, immunity reactions, immunogens, immunological reactions, mycobacterial infections, BALB mice.

Marsh, I.B.; Whittington, R.J. **Genomic diversity in *Mycobacterium avium*: Single nucleotide polymorphisms between the S and C strains of *M. avium* subsp *paratuberculosis* and with *M. a. avium*.** *Molecular and Cellular Probes*. 2007; 21(1): 66-75. ISSN: 0890-8508

**URL:** <http://www.sciencedirect.com/science/journal/08908508>

**Descriptors:** sheep; cattle; *Mycobacterium avium paratuberculosis*; strain C; strain S; *Mycobacterium avium avium*; amino acid sequence; nucleotide sequence; genomic diversity; species comparison; GenBank sequence numbers; 12,117 bp of sequence representing 26 loci across 25 genes; 11 SNPs were identified between the S and C strains in eight genes: hsp65, sodA, dnaA, dnaN, recF, gyrB, inhA, and pks8.

Montgomery, A. **Incidence and sensitivity of major bovine respiratory disease pathogens in Europe.** *Veterinary Times*. 2007; 37 (2): 24. ISSN: 1352-9374

**Descriptors:** cattle, acute signs of bovine respiratory disease, sampling with swabs, 220 pathogens isolated, *Arcanobacterium pyogenes*, *Histophilus*, *Mycobacterium bovis*, *Pasteurella haemolytica*, *Pasteurella multocida*, sensitivity to antibiotics, florfenicol, tilmicosin, tulathromycin, tetracycline, 8 European countries.

Ren, Huiping; Dover, Lynn G.; Islam, Salim T.; Alexander, David C.; Chen, Jeffrey M.; Besra, Gurdyal S.; Liu, Jun. **Identification of the lipooligosaccharide biosynthetic gene cluster from *Mycobacterium marinum*.** *Molecular Microbiology*. 2007 Mar; 63 (5): 1345-1359. ISSN: 0950-382X .

**URL:** <http://dx.doi.org/10.1111/j.1365-2958.2007.05603.x>

**NAL Call Number:** QR74.M65

**Abstract:** Lipooligosaccharides (LOSs) are antigenic glycolipids that are present in some species of *Mycobacterium* including the Canetti strain of *M. tuberculosis*. The core LOS structures from several mycobacterial organisms have been established, but the biosynthetic pathways of LOSs remain unknown. In this study, we describe two transposon insertion mutants of *M. marinum* that exhibit altered colony morphology. Cell wall analysis reveals that the MRS1271 mutant is defective in the synthesis of LOS-II, whereas the MRS1178 mutant accumulates an intermediate between LOS-I and -II. The genetic lesions were localized to two genes, MM2309 and MM2332. MM2309 encodes a UDP-glucose dehydrogenase that is involved in the synthesis of d-xylose. MM2332 is predicted to encode a decarboxylase. These two genes and a previously identified losA gene are localized in a gene cluster likely to be involved in the biosynthesis of LOSs. Our results also show that LOSs play an important role in sliding motility, biofilm formation, and infection of host macrophages. Taken together, our studies have identified, for the first time, a LOS biosynthetic locus. This is an important step in assessing the differential distribution of LOSs among *Mycobacterium* species and understanding the role of LOSs in mycobacterial virulence.

**Descriptors:** *Mycobacterium marinum*, Lipooligosaccharides, biosynthetic pathways, transposon mutants, biosynthetic locus.

Sharma, S.; Mallick, G.P.; Rishendra Verma; Ray, S.K. **Polymerase chain reaction (PCR) amplification of IS6110 sequences to detect *Mycobacterium tuberculosis* complex from formalin-fixed paraffin-embedded tissues of deer (*Axis axis*).** *Veterinary Research Communications*. 2007; 31 (1): 17-21. ISSN: 0165-7380

**URL:** <http://springerlink.metapress.com/link.asp?id=103009>

**NAL Call Number:** SF601.V38:

**Descriptors:** Axis deer (*Cervus axis*), diagnostic test, PCR IS6110 sequences, fixed tissue samples, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, India.

Sreenu, V.B.; Pankaj Kumar; Javaregowda Nagaraju; Nagarajaram, H.A. **Simple sequence repeats in mycobacterial genomes.** *Journal of Biosciences*. 2007; 32 (1): 3-5. ISSN: print 0250-5991, e-0973-7138

**URL:** <http://www.ias.ac.in/jbiosci>

**Descriptors:** *Mycobacterium*, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, DNA insertion elements, insertion sequences, microsatellites, simple sequence repeats, mobile genetic elements, mobile sequences, transposons.

Sreenu, V.B.; Pankaj Kumar; Javaregowda Nagaraju; Nagarajaram, H.A. **Microsatellite polymorphism across the *M. tuberculosis* and *M. bovis* genomes: implications on genome evolution and plasticity.** *BMC Genomics*. 2006; 7 (78): (10 April 2006). ISSN: 1471-2164

**URL:** <http://www.biomedcentral.com/content/pdf/1471-2164-7-78.pdf>

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, DNA transcription, microsatellite indel mutations, novel functions, plasticity to the mycobacterial genomes, phenotypic variability, polymorphism.

Thanky, Niren R.; Young, Douglas B.; Robertson, Brian D. **Unusual features of the cell cycle in mycobacteria: polar-restricted growth and the snapping-model of cell division.** *Tuberculosis* (Amsterdam). 2007; 87 (3): 231-236. ISSN: 1472-9792

**Descriptors:** cell divisions, mycobacterial growth, cell lengths, *Mycobacterium bovis* BCG, *Mycobacterium smegmatis*, *Mycobacterium tuberculosis*, peptidoglycan, cell poles, V shape.

Turenne, C.Y.; Wallace, R., Jr; Behr, M.A. ***Mycobacterium avium* in the postgenomic era.** *Clinical Microbiology Reviews*. 2007; 20 (2): 205-229. ISSN: 0893-8512

**URL:** <http://cmr.asm.org/cgi/content/abstract/20/2/205>

**Descriptors:** *Mycobacterium avium* complex, genomic data, detection and diagnosis, genomic variability of *Mycobacterium* subset relationships, fundamental differences and ability to cause disease.

Vega-Manriquez, X.; Lopez-Vidal, Y.; Moran, J.; Adams, L.G.; Gutierrez-Pabello, J.A. **Apoptosis-inducing factor participation in bovine macrophage *Mycobacterium bovis*-induced caspase- independent cell death.** *Infection and Immunity* (IAI). 2007 Mar; 75 (3): 1223-1228. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** *Mycobacterium tuberculosis* complex species survive and replicate in phagosomes of the host cell. Cell death (CD) has been highlighted as one of the probable outcomes in this host-pathogen interaction. Previously, our group demonstrated macrophage apoptosis as a consequence of *Mycobacterium bovis* infection. In this study, we aimed to identify the contribution of apoptotic effector elements in *M. bovis*-induced CD. Bovine macrophages were either infected with *M. bovis* (multiplicity of infection, 10:1) or treated with an *M. bovis* cell extract (CFE). Structural changes compatible with CD were evaluated. Chromatin condensation was increased three times by the CFE. On the other hand, a terminal deoxynucleotidyltransferase-mediated dUTP-biotin nick end labeling (TUNEL) assay demonstrated that levels of DNA fragmentation induced by *M. bovis* and CFE were 53.7% +/- 24% and 38.9% +/- 14%, respectively, whereas control cells had a basal proportion of 8.9% +/- 4.1%. Rates of DNA fragmentation were unaffected by the presence of the pan-caspase inhibitor N-benzyloxycarbonyl-Val-Ala-Asp (z-VAD). Cells treated with 100 (So(Bg of CFE for 12 h had a fivefold decrease in the level of mitochondrial outer membrane permeabilization compared to that of untreated cells.

Neither *M. bovis* infection nor CFE treatment induced activation of caspase 3, 8, or 9. Translocation of apoptosis-inducing factor (AIF) to the nucleus was identified in 32% +/- 3.5% and 26.3% +/- 4.9% of *M. bovis*-infected and CFE-treated cells, respectively. Incubation of macrophages with z-VAD prior to infection did not alter the percentage of cells showing AIF translocation. Our data suggest that *M. bovis*-induced CD in bovine macrophages is caspase independent with AIF participation.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, cell death, macrophage apoptosis, bacterial infection, structural changes of cell death, chromatin condensation, DNA fragmentation, mitochondrial outer membrane permeabilization, apoptosis inducing factor, caspase independent.

Waters, W.R.; Nonnecke, B.J.; Olsen, S.C.; Palmer, M.V. **Effects of pre-culture holding time and temperature on interferon-gamma responses in whole blood cultures from *Mycobacterium bovis*-infected cattle.** *Veterinary Microbiology*. 2007; 119 (2/4): 277-282. ISSN: 0378-1135

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** The Bovigam™ assay is approved for use within the United States as a complementary tuberculosis test. Prior to whole blood culture and the ensuing ELISA to detect interferon-(IFN)- gamma, samples are subjected to various holding time/temperature combinations due, in part, to practical constraints associated with shipment of samples to approved laboratories. To evaluate these effects, 5-month-old Holstein calves (n=7) received 103 cfu *Mycobacterium bovis* by aerosol. Heparinized blood was collected 2 months after challenge and held at 4 or 22 degrees C for 0, 8 or 24 h prior to culture with mycobacterial antigens or pokeweed mitogen (PWM). Responses of samples held for 8 or 24 h were comparable and lower than responses of cultures prepared immediately after collection, regardless of holding temperature. Differences in responses of samples held at 4 degrees C versus 22 degrees C were also minimal. A subset of samples was held for 2 h at 37 degrees C at the beginning of the holding period. This subset of samples had diminished responses to all stimulants and increased holding times (i.e., 24 h versus 8 h) negatively impacted the response.

Pre-processing conditions, particularly delays in set-up and initial high sample temperatures, reduces IFN- gamma responses of cells from infected cattle increasing the risk of false negatives in this assay of regulatory importance..

**Descriptors:** young Holstein cattle, experimental infection, aerosol exposure to *Mycobacterium bovis*, blood analysis, ELISA, assays, IFN-gamma responses, immunological reactions.

Westhusin, M.E.; Shin, T.; Templeton, J.W.; Burghardt, R.C.; Adams, L.G. **Rescuing valuable genomes by animal cloning: A case for natural disease resistance in cattle.** *Journal of Animal Science*. 2007 Jan; 85 (1): 138-142. ISSN: 0021-8812

**NAL Call Number:** 49 J82

**Abstract:** Tissue banking and animal cloning represent a powerful tool for conserving and regenerating valuable animal genomes. Here we report an example involving cattle and the rescue of a genome affording natural disease resistance. During the course of a 2-decade study involving the phenotypic and genotypic analysis for the functional and genetic basis of natural disease resistance against bovine brucellosis, a foundation sire was identified and confirmed to be genetically resistant to *Brucella abortus*. This unique animal was utilized extensively in numerous animal breeding studies to further characterize the genetic basis for natural disease resistance. The bull died in 1996 of natural causes, and no semen was available for AI, resulting in the loss of this valuable genome. Fibroblast cell lines had been established in 1985, cryopreserved, and stored in liquid nitrogen for future genetic analysis. Therefore, we decided to utilize these cells for somatic cell nuclear transfer to attempt the production of a cloned bull and salvage this valuable genotype. Embryos were produced by somatic cell nuclear transfer and transferred to 20 recipient cows, 10 of which became pregnant as determined by ultrasound at d 40 of gestation. One calf survived to term. At present, the cloned bull is 4.5 yr old and appears completely normal as determined by physical examination and blood chemistry. Furthermore, in vitro assays performed to date indicate this bull is naturally resistant to *B. abortus*, *Mycobacterium bovis*, and *Salmonella typhimurium*, as was the original genetic donor.

**Descriptors:** cattle, tissue banking, natural disease resistance in a bull, fibroblast cell line, cryopreserved, cloning of germplasm, 1 viable offspring, resistance to *B. abortus*, *Mycobacterium bovis*, *Salmonella typhimurium*.

Yip, Marcus J.; Porter, Jessica L.; Fyfe, Janet A.M.; Lavender, Caroline J.; Portaels, Françoise; Rhodes, Martha; Kator, Howard; Colorni, Angelo; Jenkin, Grant A.; Stinear, Tim. **Evolution of *Mycobacterium ulcerans* and other mycolactone-producing mycobacteria from a common *Mycobacterium marinum* progenitor.** *Journal of Bacteriology*. 2007; 189 (5): 2021-2029. ISSN: 0021-9193

**URL:** <http://jb.asm.org/>

**NAL Call Number:** 448.3 J82

**Descriptors:** evolution of cytotoxic polyketide mycolactones, *Mycobacterium ulcerans*, Buruli ulcers, *Mycobacterium marinum* progenitor of mycolactones, multiple genetic methods, multilocus sequence analysis, DNA-DNA hybridization, plasmid acquisition, ecotypes, pathogens of ectotherms and endotherms, mammals, frogs, fish.

## 2006

Adaekambi, Toeidi; Ben Salah, Skandar; Khelif, Mohamed; Raoult, Didier; Drancourt, Michel. **Survival of environmental mycobacteria in *Acanthamoeba polyphaga*.** *Applied and Environmental Microbiology* (AEM). 2006 Sept; 72 (9): 5974-5981. ISSN: 0099-2240

**URL:** <http://aem.asm.org/contents-by-date.0.shtml>

**NAL Call Number:** 448.3 Ap5

**Abstract:** Free-living amoebae in water are hosts to many bacterial species living in such an environment. Such an association enables bacteria to select virulence factors and survive in adverse conditions. Waterborne mycobacteria (WBM) are important sources of community- and hospital-acquired outbreaks of nontuberculosis mycobacterial infections. However, the interactions between WBM and free-living amoebae in water have been demonstrated for only few *Mycobacterium* spp. We investigated the ability of a number (n = 26) of *Mycobacterium* spp. to survive in the trophozoites and cysts of *Acanthamoeba polyphaga*. All the species tested entered the trophozoites of *A. polyphaga* and survived at this location over a period of 5 days. Moreover, all *Mycobacterium* spp. survived inside cysts for a period of 15 days. Intracellular *Mycobacterium* spp. within amoeba cysts survived when exposed to free chlorine (15 mg/liter) for 24 h. These data document the interactions between free-living amoebae and the majority of waterborne *Mycobacterium* spp. Further studies are required to examine the effects of various germicidal agents on the survival of WBM in an aquatic environment.

**Descriptors:** *Acanthamoeba polyphaga* free living amoebae, survival of *Mycobacterium* in *A. polyphaga* cysts, source of waterborne *Mycobacterium* infections.

Akey, David; Martins, Alexandra; Aniuoku, Jidefor; Glickman, Michael S.; Shuman, Stewart; Berger, James M. **Crystal Structure and nonhomologous end-joining function of the ligase component of *Mycobacterium* DNA ligase D.** *Journal of Biological Chemistry*. 2006 May 12; 281(19): 13412-13423. ISSN: 0021-9258

**URL:** <http://www.jbc.org/>

**NAL Call Number:** 381 J824

**Abstract:** DNA ligase D (LigD) is a large polyfunctional enzyme involved in nonhomologous end-joining (NHEJ) in mycobacteria. LigD consists of a C-terminal ATP-dependent ligase domain fused to upstream polymerase and phosphoesterase modules. Here we report the 2.4 eÅ crystal structure of the ligase domain of *Mycobacterium* LigD, captured as the covalent ligase-AMP intermediate with a divalent metal in the active site. A chloride anion on the protein surface coordinated by the ribose 3'-OH and caged by arginine and lysine side chains is a putative mimetic of the 5'-phosphate at a DNA nick. Structure-guided mutational analysis revealed distinct requirements for the adenylation and end-sealing reactions catalyzed by LigD.

We found that a mutation of *Mycobacterium* LigD that ablates only ligase activity results in decreased fidelity of NHEJ in vivo and a strong bias of mutagenic events toward deletions instead of insertions at the sealed DNA ends. This phenotype contrasts with the increased fidelity of double-strand break repair in [Δ]ligD cells or in a strain in which only the polymerase function of LigD is defective. We surmise that the signature error-prone quality of bacterial NHEJ in vivo arises from a dynamic balance between the end-remodeling and end-sealing steps.

**Descriptors:** *Mycobacterium*, DNA ligaseD, crystal structure, biochemistry, polyfunctional enzyme, end remodeling, end sealing.

Allix, Caroline; Walravens, Karl; Saegerman, Claude; Godfroid, Jacques; Supply, Philip; Fauville-Dufaux, Maryse. **Evaluation of the epidemiological relevance of variable number tandem-repeat genotyping of *Mycobacterium bovis* and comparison of the method with IS6110 restriction fragment length polymorphism analysis and spoligotyping.** *Journal of Clinical Microbiology*. 2006 June; 44 (6): 1951-1962. ISSN: 0095-1137. E-ISSN: 1098-660X

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1489394>

**NAL Call Number:** QR46.J6

**Abstract:** Sources of *Mycobacterium bovis* contamination remain unclear for many cases of animal and human disease. A major limitation is the lack of sufficiently informative or epidemiologically well evaluated molecular methods for typing. Here, we report an evaluation of a high-throughput method based on 29 mycobacterial interspersed repetitive unit-variable-number tandem-repeat (MIRU-VNTR) loci to genotype 127 *M. bovis* isolates from cattle from 77 different Belgian farms, representative of a nationwide collection obtained from 1995 to 2003. MIRU-VNTR stability was demonstrated by analyzing a series of 74 isolates in total, obtained from different animals from a single farm or from different farms with an identified epidemiological link. The genotyping results and the genotypic diversity (h) were compared with those obtained by IS6110 restriction fragment length polymorphism (RFLP) analysis and spoligotyping. Among 68 isolates with no known epidemiological link, MIRU-VNTR typing discriminated better than either RFLP analysis or spoligotyping, with isolates taken individually (32 versus 16 and 17 genotypes; h = 0.91 versus 0.73 and 0.85, respectively) or in combination (32 versus 28 genotypes; h = 0.91 versus 0.92). Maximal resolution was already achieved with a subset of 9 loci. The observed congruence of the genetic relationships based on IS6110 RFLP analysis, spoligotyping, and MIRU-VNTR markers is consistent with a clonal population structure of *M. bovis*. These results support MIRU-VNTR typing as a convenient and discriminatory technique for analysis of the population structure of *M. bovis* in much greater detail and for addressing some still unresolved issues in the epidemiology of the pathogen.

**Descriptors:** *Mycobacterium bovis*, cattle isolates, animal bacterial pathogen, epidemiology, discriminatory technique for population analysis, 29 mycobacterial interspersed repetitive unit-variable-number tandem-repeat (MIRU-VNTR) loci to genotype 127.

Arraiza, N.; Romay, Z.; Faria, N.; Mujica, D. **Identificación diferencial de aislados clínicos de *Mycobacterium tuberculosis* y *Mycobacterium bovis* por un ensayo de RCP múltiple. [Differential identification of *Mycobacterium tuberculosis* and *Mycobacterium bovis* clinical isolates by multiplex PCR assay.]** *Revista Científica, Facultad de Ciencias Veterinarias, Universidad del Zulia*. 2006; 16 (6): 622-628. ISSN: 0798-2259.

Note: In Spanish with an English summary.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, efficacy of PCR to differentiate *Mycobacterium* species, targeted Rv0577 and Rv1510 gene sequences, zoonotic infections.

Bartos, Milan; Hložek, Pavel; Svastova, Petra; Dvorska, Lenka; Bull, Tim; Matlova, Ludmila; Parmova, Ilona; Kuhn, Isolde; Stubbs, Janine; Moravkova, Monika; Kint, Jaromir; Beran, Vladimir; Melicharek, Ivan; Ocepek, Matjaz; Pavlik, Ivo. **Identification of members of *Mycobacterium avium* species by Accu-Probes, serotyping, and single IS900, IS901, IS1245 and IS901-flanking region PCR with internal standards.** *Journal of Microbiological Methods*. 2006; 64(3): 333-345. ISSN: 0167-7012

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/506034/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/506034/description#description)

**NAL Call Number:** QR65.J68

**Descriptors:** *Mycobacterium avium* species, *Mycobacterium avium* ssp. *paratuberculosis* (n = 961), *Mycobacterium avium avium* (n = 677), *Mycobacterium avium silvaticum* (n = 5), *Mycobacterium avium hominissuis* (n = 1566), *Mycobacterium tuberculosis*, *Mycobacterium bovis* (n = 13), *Mycobacterium bovis* BCG (n = 4), *Mycobacterium caprae* (n = 10), *Mycobacterium intracellulare* (n = 60), atypical mycobacteria (n = 256)

including *Mycobacterium fortuitum*, *Mycobacterium chelonae*, *Mycobacterium scrofulaceum*, *Mycobacterium gastri*, insertion sequences IS900, IS901, IS1245, and flanking region (FR300) of IS901, PCR of alfalfa genome segment and inserted into plasmid vector, recombinant plasmids, internal amplicons, PCR typing compared with serotyping and Accu-Probes analyses in selected field isolates.

Cadmus, Simeon; Palmer, Si; Okker, Melissa; Dale, James; Gover, Karen; Smith, Noel; Jahans, Keith; Hewinson, R. Glyn; Gordon, Stephen V. **Molecular analysis of human and bovine tubercle bacilli from a local setting in Nigeria.** *Journal of Clinical Microbiology*. 2006. 44 (1): 29-34. ISSN: 0095-1137

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1489394>

**NAL Call Number:** QR46.J6

**Abstract:** To establish a molecular epidemiological baseline for the strains causing tuberculosis in Nigeria, a survey of isolates from humans and cattle was carried out. Spoligotyping and variable-number tandem-repeat analysis revealed that the majority of tuberculosis disease in humans in Ibadan, southwestern Nigeria, is caused by a single, closely related group of *Mycobacterium tuberculosis* strains. Using deletion typing, we show that approximately 13% of the disease in humans in this sample was caused by strains of *Mycobacterium africanum* and *Mycobacterium bovis* rather than *M. tuberculosis*. Molecular analysis of strains of *M. bovis* recovered from Nigerian cattle show that they form a group of closely related strains that show similarity to strains from neighboring Cameroon. Surprisingly, the strains of *M. bovis* recovered from humans do not match the molecular type of the cattle strains, and possible reasons for this are discussed. This is the first molecular analysis of *M. tuberculosis* complex strains circulating among humans and cattle in Nigeria, the results of which have significant implications for disease control.

**Descriptors:** humans, cattle, tubercular bacilli, *Mycobacterium africanum*, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, molecular analysis of *Mycobacterium tuberculosis* complex strains, spoligotyping and variable-number tandem-repeat analysis, Nigeria.

Chambers, M.A.; Gavier-Widen, D.; Hewinson, R.G. **Histopathogenesis of experimental *Mycobacterium bovis* infection in mice.** *Research in Veterinary Science*. 2006. 80 (1): 62-70. ISSN: 0034-5288

**URL:** [http://www.elsevier.com/locate/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/locate/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Descriptors:** mice, cattle, badgers, *Mycobacterium bovis*, animal disease models, bovine tuberculosis, histopathology, pathogenesis, virulence, lesions animal, disease severity, host-pathogen relationships, vaccination, pathogenicity, model validation.

Chilima, Benson Z.; Clark, Ian M.; Floyd, Sian; Fine, Paul E. M.; Hirsch, Penny R. **Distribution of environmental *Mycobacteria* in Karonga District, Northern Malawi.** *Applied and Environmental Microbiology*. 2006 Apr; 72 (4): 2343-2350. ISSN: 0099-2240

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=83>

**NAL Call Number:** 448.3 AP5

**Abstract:** The genus includes many species that are commonly found in the environment (in soil and water or associated with plants and animals), as well as species that are responsible for two major human diseases, tuberculosis (*Mycobacterium tuberculosis*) and leprosy (*Mycobacterium leprae*). The distribution of environmental mycobacteria was investigated in the context of a long-term study of leprosy, tuberculosis, *Mycobacterium bovis* BCG vaccination, and the responses of individuals to various mycobacterial antigens in Karonga District, northern Malawi, where epidemiological studies had indicated previously that people may be exposed to different mycobacterial species in the northern and southern parts of the district. A total of 148 soil samples and 24 water samples were collected from various locations and examined to determine the presence of mycobacteria. The detection method involved semi-selective culturing and acid-fast staining, following decontamination of samples to enrich mycobacteria and reduce the numbers of other microorganisms, or PCR with primers specific for the mycobacterial 16S rRNA gene, using DNA extracted directly from soil and water samples. Mycobacteria were detected in the majority of the samples, and subsequent sequence analysis of PCR products amplified directly from soil DNA indicated that most of the products were related to known environmental mycobacteria. For both methods the rates of recovery were consistently higher for dry season samples than for wet season samples. All isolates cultured from soil appeared to be strains of *Mycobacterium fortuitum*. This study revealed a complex pattern for the environmental mycobacterial flora but identified no clear differences between the northern and southern parts of Karonga District.

**Descriptors:** soil bacteria, *Mycobacterium*, *Mycobacterium fortuitum*, cell culture, differential staining, decontamination, polymerase chain reaction, species diversity, ribosomal RNA, genes, nucleotide sequences, phylogeny, molecular sequence data, decontamination culture, Malawi.

Chitra, M. Ananda; Kishore, Subodh. **Effect of mycobacterial lipoarabinomannan on interleukin-2 production by bovine lymphocytes.** *Indian Veterinary Journal*. 2006; 83 (7): 703-707. ISSN: 0019-6479

**NAL Call Number:** 41.8 IN2

**Descriptors:** *Mycobacterium bovis*, lipoarabinomannan (LAM), major antigen of mycobacterial envelope, immunological activities, cytokines, lymphocyte proliferation, induction of interleukin 2.

Collins, Desmond M.; Skou, Bronwyn; White, Stefan; Bassett, Shalome; Collins, Lauren; For, Raewyn; Hurr, Kathryn; Hotter, Grant; de Lisle, Geoffrey W. **Generation of attenuated *Mycobacterium bovis* strains by signature-tagged mutagenesis for discovery of novel vaccine candidates.** *Infection and Immunity*. 2005; 73 (4): 2379-2386. ISSN: 0019-9567

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?iid=117182>

**NAL Call Number:** QR1.I57

**Abstract:** *Mycobacterium bovis*, a member of the *Mycobacterium tuberculosis* complex, has a particularly wide host range and causes tuberculosis in most mammals, including humans. A signature tag mutagenesis approach, which employed illegitimate recombination and infection of guinea pigs, was applied to *M. bovis* to discover genes important for virulence and to find potential vaccine candidates. Fifteen attenuated mutants were identified, four of which produced no lesions when inoculated separately into guinea pigs. One of these four mutants had nine deleted genes including mmpL4 and sigK and, in guinea pigs with aerosol challenge, provided protection against tuberculosis at least equal to that of *M. bovis* BCG. Seven mutants had mutations near the esxA (esat-6) locus, and immunoblot analysis of these confirmed the essential role of other genes at this locus in the secretion of EsxA (ESAT-6) and EsxB (CFP10). Mutations in the eight other attenuated mutants were widely spread through the chromosome and included pks1, which is naturally inactivated in clinical strains of *M. tuberculosis*. Many genes identified were different from those found by signature tag mutagenesis of *M. tuberculosis* by use of a mouse infection model and illustrate how the use of different approaches enables

identification of a wider range of attenuating mutants.

**Descriptors:** *Mycobacterium bovis*, attenuated mutants, illegitimate recombination and infection of guinea pigs.

Cosma, Christine L.; Klein, Kathryn; Kim, Rosa; Beery, Dana; Ramakrishnan, Lalita. ***Mycobacterium marinum* Erp is a virulence determinant required for cell wall integrity and intracellular survival.** *Infection and Immunity* (IAI). 2006 June; 74 (6): 3125-3133. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The *Mycobacterium tuberculosis* exported repetitive protein (Erp) is a virulence determinant required for growth in cultured macrophages and in vivo. To better understand the role of Erp in *Mycobacterium* pathogenesis, we generated a mutation in the Erp homologue of *Mycobacterium marinum*, a close genetic relative of *M. tuberculosis*. Erp-deficient *M. marinum* was growth attenuated in cultured macrophage monolayers and during chronic granulomatous infection of leopard frogs, suggesting that Erp function is similarly required for the virulence of both *M. tuberculosis* and *M. marinum*. To pinpoint the step in infection at which Erp is required, we utilized a zebrafish embryo infection model that allows *M. marinum* infections to be visualized in real-time, comparing the Erp-deficient strain to a [Delta]RD1 mutant whose stage of attenuation was previously characterized in zebrafish embryos. A detailed microscopic examination of infected embryos revealed that bacteria lacking Erp were compromised very early in infection, failing to grow and/or survive upon phagocytosis by host macrophages. In contrast, [Delta]RD1 mutant bacteria grow normally in macrophages but fail to induce host macrophage aggregation and subsequent cell-to-cell spread. Consistent with these in vivo findings, erp-deficient but not RD1-deficient bacteria exhibited permeability defects in vitro, which may be responsible for their specific failure to survive in host macrophages.

**Descriptors:** *Mycobacterium tuberculosis*, *Mycobacterium marinum*, exported repetitive protein, virulence determinant, cultured macrophages, invivo, pathogenesis, infection of leopard frogs, infected embryos, early infections, permeability.

Costello, E.; Flynn, O.; Quigley, F.; O'Grady, D.; Griffin, J.; Clegg, T.; McGrath, G. **Genotyping of *Mycobacterium bovis* isolates from badgers in four areas of the Republic of Ireland by restriction fragment length polymorphism analysis.** *Veterinary Record* (London). 2006; 159(19): 619-623. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/archive/>

**NAL Call Number:** 41.8 V641

**Descriptors:** *Mycobacterium bovis* isolates from badgers, tissue sampling of 2310 animals, RFLP analysis with IS6110, polymorphic GC-rich sequence (PGRS), direct repeat sequence (DR) probes, 398 isolates, 52 RFLP types identifies, movement of badgers between territories, Republic of Ireland.

Costello, E.; Flynn, O.; Quigley, F.; O'Grady, D.; Griffin, J.; Clegg, T.; McGrath, G. **Genotyping of *Mycobacterium bovis* isolates from badgers in four areas of the Republic of Ireland by restriction fragment length polymorphism analysis.** *Veterinary Record* (London). 2006; 159(19): 619-623. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/archive/>

**NAL Call Number:** 41.8 V641

**Descriptors:** *Mycobacterium bovis* isolates from badgers, tissue sampling of 2310 animals, RFLP analysis with IS6110, polymorphic GC-rich sequence (PGRS), direct repeat sequence (DR) probes, 398 isolates, 52 RFLP types identifies, movement of badgers between territories, Republic of Ireland.

Courtenay, O.; Reilly, L.A.; Sweeney, F.P.; Hibberd, V.; Bryan, S.; Ul Hassan, A.; Newman, C.; Macdonald, D.W.; Delahay, R.J.; Wilson, G.J.; Wellington, E.M.H. **Is *Mycobacterium bovis* in the environment important for the persistence of bovine tuberculosis?** *Biology Letters*. 2006; 2 (3): 460-462. ISSN: 1744-9561

**URL:** [http://www.pubs.royalsoc.ac.uk/biol\\_lett](http://www.pubs.royalsoc.ac.uk/biol_lett)

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, prevalence of pathogen in environment, detectability of *M. bovis*, badger setts and latrines, environmental reservoir, endemic on cattle farms, Britain.

Cruz, Andrea; Khader, Shabaana A; Torrado, Egidio; Fraga, Alexandra; Pearl, John E; Pedrosa, Jorge; Cooper, Andrea M.; Castro, Antonio G.

**Cutting edge: IFN-gamma regulates the induction and expansion of IL-17-producing CD4 T cells during mycobacterial infection.** *Journal of Immunology*. 2006; 177 (3): 1416-1420. ISSN: 0022-1767.

**URL:** <http://www.jimmunol.org>

**NAL Call Number:** 448.8 J8232

**Descriptors:** *Mycobacterium bovis* bacille Calmette Guerin, IFN-gamma deficient mice, IL 17 producing T cells, IL-12 and IL-23 from bone-marrow-derived dendritic cells, changes in expression levels, counter regulation pathway, effects on immune response.

Daly, M.; Diegel, K.L.; Fitzgerald, S.D.; Schooley, A.; Berry, D.E.; Kaneene, J.B. **Patterns of antimicrobial susceptibility in Michigan wildlife and bovine isolates of *Mycobacterium bovis*.** *Journal of Veterinary Diagnostic Investigation*. 2006 July; 18 (4): 401-404. ISSN: 1040-6387.

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** *Mycobacterium bovis*, bacterial isolates, wildlife and bovine sources, susceptibility to antibacterial compounds.

Endsley, Janice J.; Endsley, Mark A; Estes, D Mark. **Bovine natural killer cells acquire cytotoxic/effector activity following activation with IL-12/15 and reduce *Mycobacterium bovis* BCG in infected macrophages.** *Journal of Leukocyte Biology*. 2006; 79 (1): 71-79. ISSN: 0741-5400

**URL:** <http://www.jleukbio.org/>

**NAL Call Number:** QP185.R4

**Descriptors:** blood, blood and lymphatics, nervous system, macrophage, immune system, monocytes, leukocytes, T lymphocytes, CD4 positive T cells, bovine natural-killer-cells: NK cells, CD3, mRNA, IL-2, IL-12, IL-15, CD8, CD25, CD94, NKp46, p46, CD244, CD56, neural adhesion molecule, granulysin, perforin, *Mycobacterium bovis* bacillus Calmette Guerin.

Fenner, D.C.; Beurge, B.; Kayser, H.P.; Wittenbrink, M.M. **The anti-microbial activity of electrolysed oxidizing water against microorganisms relevant in veterinary medicine.** *Zentralblatt für Veterinärmedizin Reihe-B.* 2006 Apr; 53 (3): 133-137. ISSN: 0931-1793

**URL:** <http://dx.doi.org/10.1111/j.1439-0450.2006.00921.x>

**NAL Call Number:** 41.8 Z52

**Abstract:** Standards of the German Association of Veterinary Medicine (DVG) for the evaluation of chemical disinfectants were used to assess the anti-microbial efficacy of electrolysed oxidizing water (EOW). *Enterococcus faecium*, *Mycobacterium avium* subspecies *avium*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Candida albicans* were exposed to anode EOW (pH, 3.0 \* left-pointing-double-angle \* 0.1; oxidation-reduction potential (ORP), +1100 \* left-pointing-double-angle \* 50 mV; free chlorine, 400 \* left-pointing-double-angle \* 20 mg/l Cl subscript 2(B) and combined EOW (7 : 3 anode : cathode, v/v; pH, 8.3 \* left-pointing-double-angle \* 0.1; ORP, 930-950 mV; free chlorine, 271 \* left-pointing-double-angle \* 20 mg/l Cl subscript 2(B)). In water of standardized hardness (WSH), all bacterial strains were completely inactivated by a 30 min exposure to maximum 10.0% anode EOW ([approximately]40.0 mg/l Cl subscript 2(B) or 50.0% combined EOW ([approximately]135.5 mg/l Cl subscript 2(B)). The sensitivity ranking order for anode EOW to the bacterial test strains was *P. mirabilis* > *S. aureus* > *M. avium* ssp. *avium* > *E. faecium* > *P. aeruginosa*. *P. mirabilis* and *S. aureus* decreased to undetectable levels after 5 min of exposure to 7.5% anode EOW ([approximately]30.0 mg/l Cl subscript 2(B)). *Candida albicans* was completely inactivated by a 5-min exposure to 5.0% anode EOW. Both, anode and combined EOW exhibited no anti-microbial activities in standardized nutrient broth or after addition of 20.0% bovine serum to the WSH.

Further research is necessary to evaluate the efficacy of EOW as a disinfectant under operating conditions in animal production facilities.

**Descriptors:** cattle, animal pathogens, disinfectants, antimicrobial agents, oxidants, chlorine, duration, nutrient solutions, blood serum, water-hardness, *Enterococcus faecium*, *Mycobacterium avium* ssp. *avium*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, electrolysed oxidizing water, oxidation resistance, anodes, cathodes.

Food and Agriculture Organization. **Capacity building for surveillance and control of zoonotic diseases, FAO/WHO/OIE Expert and Technical Consultation, Rome, 14-16 June 2005.** *FAO Animal Production and Health Proceedings.* 2006; (7): 112 pp. ISSN: 1810-0732

**URL:** <http://www.fao.org>

**Abstract:** This proceeding contains 14 papers. This publication is intended to assist veterinary public health services in Developing Countries and countries in transition in the implementation of capacity-building programmes on surveillance and control of zoonotic diseases. Specific recommendations were made on implementation of surveillance methodologies for zoonotic diseases. There is a special emphasis on Developing Countries. The topics include: recommendations for training programs in surveillance methodologies at veterinary and para-veterinary levels; surveillance program in taeniasis/cysticercosis; capacity building for the surveillance, prevention and control of BSE; control of zoonotic disease under emergency conditions; surveillance and control programs in brucellosis, *Mycobacterium bovis*, tuberculosis, anthrax, salmonellosis and other foodborne pathogens; surveillance, early weaning and early reaction to zoonoses outbreaks; and surveillance approaches in antimicrobial resistance.

**Descriptors:** animal health, training programs, disease surveillance programs, major bacterial diseases, parasites, *Burcella*, *Mycobacterium bovis*, BSE, Developing Countries.

Gao, Lian Yong; Pak, Melissa; Kish, Rabab; Kajihara, Kimberly; Brown, Eric J. **A Mycobacterial operon essential for virulence in vivo and invasion and intracellular persistence in macrophages.** *Infection and Immunity.* 2006 Mar; 74(3): 1757-1767. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The ability to invade and grow in macrophages is necessary for *Mycobacterium tuberculosis* to cause disease. We have found a *Mycobacterium marinum* locus of two genes that is required for both invasion and intracellular survival in macrophages. The genes were designated iipA (mycobacterial invasion and intracellular persistence) and iipB. The iip mutant, which was created by insertion of a kanamycin resistance gene cassette at the 5' region of iipA, was completely avirulent to zebra fish. Expression of the *M. tuberculosis* orthologue of iipA, Rv1477, fully complemented the iip mutant for infectivity in vivo, as well as for invasion and intracellular persistence in macrophages. In contrast, the iipB orthologue, Rv1478, only partially complemented the iip mutant in vivo and restored invasion but not intracellular growth in macrophages. While iipA and iipB differ at their N termini, they are highly similar throughout their C-terminal NLPC\_p60 domains. The p60 domain of Rv1478 is fully functional to replace that of Rv1477, suggesting that the N-terminal sequence of Rv1477 is required for full virulence in vivo and in macrophages.

Further mutations demonstrated that both Arg-Gly-Asp (RGD) and Asp-Cys-Ser-Gly (DCSG) sequences in the p60 domain are required for function. The iip mutant exhibited increased susceptibility to antibiotics and lysozyme and failed to fully separate daughter cells in liquid culture, suggesting a role for iip genes in cell wall structure and function. Altogether, these studies demonstrate an essential role for a p60-containing protein, iipA, in the pathogenesis of *M. marinum* infection.

**Descriptors:** *Mycobacterium marinum*, genes for invasion and survival in macrophages, iipA, iipB, mutants.

Godden, S.; McMartin, S.; Feirtag, J.; Stabel, J.; Bey, R.; Goyal, S.; Metzger, L.; Fetrow, J.; Wells, S.; Chester-Jones, H. **Heat-treatment of bovine colostrum. II: Effects of heating duration on pathogen viability and immunoglobulin G.** *Journal of Dairy Science.* 2006 Sept; 89 (9): 3476-3483. ISSN: 0022-0302

**NAL Call Number:** 44.8 J822

**Abstract:** Batches (30-L) of first-milking bovine colostrum, inoculated with *Mycoplasma bovis* (10 superscript 8(B cfu/mL), *Listeria monocytogenes* (10 superscript 6(B cfu/mL), *Escherichia coli* O157:H7 (10 superscript 6(B cfu/mL), *Salmonella enteritidis* (10 superscript 6(B cfu/mL), and *Mycobacterium avium* subsp. *paratuberculosis* (Map; 10 superscript 3(B cfu/mL), were heat-treated at 60AC for 120 min in a commercial on-farm batch pasteurizer system. Duplicate 50-mL subsamples of colostrum were collected at 15-min intervals throughout the heat-treatment process for the purpose of bacterial culture and for measurement of IgG concentration (mg/mL) and antibody activity [log subscript 2(Bovine viral diarrhea virus type 1 serum neutralization titer)]. Four replicate batches of colostrum were run for each of the 5 pathogens studied. There was no effect of heating moderate- to high-quality colostrum at 60AC for at least 120 min on mean IgG concentration (pre = 60.5 mg/mL; post = 59.1 mg/mL). Similarly, there was no effect of heat-treatment on the mean log subscript 2(Bovine viral diarrhea virus type 1 serum neutralization titer (pre = 12.3; post = 12.0)). Viable *M. bovis*, *L. monocytogenes*, *E. coli* O157:H7, and *S. enteritidis* added to colostrum could not be detected after the colostrum was heat-treated at 60AC for 30 min. Average bacteria counts showed that Map was not detected when batches were heated at 60AC for 60 min. Although the authors believe that heat-treating colostrum at 60AC for 60 min should be sufficient to eliminate Map from colostrum in most situations, further research is needed to determine whether these findings may be replicated, given that variability was observed in Map culture results.

**Descriptors:** first milking colostrum, inoculation with *Mycoplasma bovis*, *Mycobacterium avium paratuberculosis*, *Salmonella enteritidis*, *Listeria monocytogenes*, *Escherichia coli*, heat treatment process to inactivate the pathogens.

Hao, Jun Feng; Zhao, De Ming. **Cloning and prokaryotic expression of *Mycobacterium bovis* MB1916c gene.** *Journal of China Agricultural University*. 2006; 11 (6): 1-6. ISSN: 1007-4333. Note: In Chinese with an English summary.

**NAL Call Number:** S19-C58

**Descriptors:** *Mycobacterium bovis*, amplification of MB1916 gene, PCR technique.

Harris, N. Beth; Payeur, Janet B.; Kapur, Vivek; Sreevatsan, Srinand. **Short-Sequence-Repeat analysis of *Mycobacterium avium* subsp. *paratuberculosis* and *Mycobacterium avium* subsp. *avium* isolates collected from animals throughout the United States reveals both stability of loci and extensive diversity.** *Journal of Clinical Microbiology*. 2006 Aug; 44 (8): 2970-2973. ISSN: 0095-1137

**URL:** <http://jcm.asm.org/>

**NAL Call Number:** QR46 .J6

**Abstract:** We analyzed the multilocus short sequence repeats (SSRs) of 211 and 56 isolates of *Mycobacterium avium* subsp. *paratuberculosis* and *M. avium* subsp. *avium*, respectively. The *M. avium* subsp. *paratuberculosis* isolates could be differentiated into 61 genotypes. The *M. avium* subsp. *avium* isolates showed limited diversity. These SSRs are stable and suitable for studying the molecular epidemiology of *M. avium* subsp. *paratuberculosis*.

**Descriptors:** *Mycobacterium avium* subsp. *paratuberculosis*, *M. avium* subsp. *avium*, isolate identification, multilocus short sequence repeats, diversity, molecular epidemiology.

Hervas-Stubbs, Sandra; Majlessi, Laleh; Simsova, Marcela; Morova, Jana; Rojas, Marie-Jesus; Nouz\_e,-Clemence; Brodin, Priscille; Sebo, Peter; Leclerc, Claude. **High frequency of CD4<sup>+</sup> T cells specific for the TB10.4 protein correlates with protection against *Mycobacterium tuberculosis* infection.** *Infection and immunity (IAI)*. 2006; 74: (6): 3396-3407. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** TB10.4 is a newly identified antigen of *Mycobacterium tuberculosis* recognized by human and murine T cells upon mycobacterial infection. Here, we show that immunization with *Mycobacterium bovis* BCG induces a strong, genetically controlled, Th1 immune response against TB10.4 in mice. BALB/c and C57BL/6 strains behave as high and low responders to TB10.4 protein, respectively. The TB10.4:74-88 peptide was identified as an immunodominant CD4<sup>+</sup> T-cell epitope for H-2d mice. Since recent results, as well as the present study, have raised interest in TB10.4 as a subunit vaccine, we analyzed immune responses induced by this antigen delivered by a new vector, the adenylate cyclase (CyaA) of *Bordetella pertussis*. CyaA is able to target dendritic cells and to deliver CD4<sup>+</sup> or CD8<sup>+</sup> T-cell epitopes to the major histocompatibility complex class II/I molecule presentation pathways, triggering specific Th1 or cytotoxic T-lymphocyte (CTL) responses. Several CyaA harboring either the entire TB10.4 protein or various subfragments containing the TB10.4:20-28 CTL epitope were shown to induce TB10.4-specific Th1 CD4<sup>+</sup> and CD8<sup>+</sup> T-cell responses. However, none of the recombinant CyaA, injected in the absence of adjuvant, was able to induce protection against *M. tuberculosis* infection. In contrast, TB10.4 protein administered with a cocktail of strong adjuvants that triggered a strong Th1 CD4<sup>+</sup> T-cell response induced significant protection against *M. tuberculosis* challenge. These results confirm the potential value of the TB10.4 protein as a candidate vaccine and show that the presence of high frequencies of CD4<sup>+</sup> T cells specific to this strong immunogen correlates with protection against *M. tuberculosis* infection.

**Descriptors:** mice, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, TB10.4, newly identified antigen, possible vaccination candidate, immune response in mice, CD4<sup>+</sup> T cells, CD8<sup>+</sup> T cells.

Hewinson, R.G.; Vordermeier, H.M.; Smith, N.H.; Gordon, S.V. **Recent advances in our knowledge of *Mycobacterium bovis*: a feeling for the organism.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 127-139. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Significant and rapid progress has been made in our knowledge and understanding of *Mycobacterium bovis* since the last international *M. bovis* conference 5 years ago. Much of this progress has been underpinned by the completion of the genome sequence. This important milestone has catalysed research into the development of a number of improved tools with which to combat bovine tuberculosis. In this article we will review recent progress made in the development of these tools and in our understanding of the organism, its evolution and spread. Comparison of the genome sequence with those of other members of the *Mycobacterium tuberculosis* complex has enabled insights into the evolution of *M. bovis*. This analysis also indicates that the *M. tuberculosis* complex have the propensity to adapt to new host species. The use of high throughput molecular typing methods has revealed that the recent bovine tuberculosis epidemic in Great Britain is being driven by a number of clonal expansions, which cannot be explained by random mutation and drift alone. Completion of a number of mycobacterial genome sequences has allowed the development of antigen mining techniques that rapidly identify *M. bovis*-specific genes. These can then be used as reagents in the gamma interferon assay to increase the specificity of the assay and also to discriminate between *Bacillus of Calmette and Guérin* (BCG) vaccinated animals and those infected with *M. bovis*. In the longer term, comparisons between the genomes of *M. bovis* and BCG will allow insight into how BCG became attenuated following serial passage on artificial growth media and reveal clues into how to improve the vaccine efficacy of BCG.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, genomics, nucleotide sequences, microbial genetics, genome, evolution, host range, adaptation, disease outbreaks, genetic drift, bacterial antigens, BCG vaccine, vaccination, molecular sequence data.

Hicks, D.J.; Johnson, L.; Mitchell, S.M.; Gough, J.; Cooley, W.A.; La-Ragione, R.M.; Spencer, Y.I.; Wangoo, A. **Evaluation of zinc salt based fixatives for preserving antigenic determinants for immunohistochemical demonstration of murine immune system cell marker.** *Biotechnic and Histochemistry*. 2006; 81(1): 23-30. ISSN: 1052-0295

**URL:** <http://www.informaworld.com/smpp/title~content=t713692932>

**NAL Call Number:** QH613.B56

**Descriptors:** immunohistochemical techniques antigen, cytokine and cytomorphological markers; fixatives; mouse models for *Mycobacterium bovis* infection; tissues from RIII mice; zinc salt fixative; buffered formalin; tested CD3, CD4, CD8, CD45, CD54, F4/80, Interferon-gamma, MIP2.

Hines, N.; Payeur, J.B.; Hoffman, L.J. **Comparison of the recovery of *Mycobacterium bovis* isolates using the BACTEC MGIT 960 system, BACTEC 460 system, and Middlebrook 7H10 and 7H11 solid media.** *Journal of Veterinary Diagnostic Investigation*. 2006 May; 18 (3): 243-250. ISSN: 1040-6387

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** cattle, lymph nodes, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, strains, pathogen identification, diagnosis, culture media, tissue analysis, niacin, nitrates, microbial contamination, disease detection, new methods.

Hogarth, P.J.; Hewinson, R.G.; Vordermeier, H.M. **Development of vaccines against bovine tuberculosis.** *Journal of Pharmacy and Pharmacology*. 2006; 58 (6): 749-757. ISSN: 0022-3573

**URL:** <http://www.pharmpress.com/jpp>

**Descriptors:** buffalo, cattle, *Mycobacterium bovis*, zoonotic disease, disease control, review, vaccine research, Great Britain,

Horwitz, Marcus A.; Harth, Guenter; Dillon, Barbara Jane; Maslesa-Galic, Sasa. **A novel live recombinant mycobacterial vaccine against bovine tuberculosis more potent than BCG.** *Vaccine*. 2006; 24 (10): 1593-1600. ISSN: 0264-410X

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/30521/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/30521/description#description)

**Descriptors:** vaccination, cattle, other domesticated animal diseases, wild animal as disease reservoirs, *Mycobacterium bovis*, live recombinant vaccine, rBCG30 expresses large amounts of the *Mycobacterium tuberculosis*, 30kDa major secretory protein, more efficacious against bovine tuberculosis than BCG, aerosol challenge.

Jiang Xiu yun; Wang, Chun feng; Wang, Chun fang; Zhang, Peng ju; He, Zhao yang. **Cloning and expression of *Mycobacterium bovis* secreted protein MPB83 in *Escherichia coli*.** *Journal of Biochemistry and Molecular Biology*. 2006; 39 (1): 22-25. ISSN: 1225-8687

**Descriptors:** *Mycobacterium bovis* Vallee111, gene encoding MPB83, PCR amplification, pGEM-T vector, cloning plasmid pGEM T 83 was constructed, BamH1 and EcoRI digestion, purified MPB83 gene was subcloned, prokaryotic expression vector pET28a-83 was constructed, transformed into competence *Escherichia coli* BL21 (DE3), 26 kDa exogenous protein observed on SDS-PAGE, possible subunit vaccine, DNA vaccine of MPB83 gene.

Jiang, XiuYun; Wang, ChunFeng; Wang, ChunFang; He, ZhaoYang. **Cloning and expression of *Mycobacterium bovis* secreted protein Ag85B in *E. coli*.** *Chinese Journal of Veterinary Science*. 2006; 26(1): 51-54. ISSN: 1005-4545. Note: In Chinese with an English summary.

**Descriptors:** cattle, *Escherichia coli*, *Mycobacterium tuberculosis*, DNA cloning, identify, gene expression, Clone vector pGEM-T-85B, secreted protein Ag85B from *Mycobacterium bovis* Vallee 111, PCR, diagnosis, plasmid containing pET28a-85B transformed into *E. coli* BL21(DE3).

Juan, L. de; Alvarez, J.; Aranaz, A.; Bezos, J.; Romero, B.; Mateos, A.; Dominguez, L.; Travnicek, M. **Epizootologia a diagnostika mykobakterialnych infekcii. Cast I. Tuberkuloza. [Epidemiology and diagnosis of mycobacterial infections. Part I. Tuberculosis.]** *Slovensky Veterinarsky Casopis*. 2006; 31 (2): 94-97. ISSN: 1335-0099. Note: In Slovakian with an English summary.

**Descriptors:** diagnostic techniques, epidemiology, *Mycobacterium bovis*, *Mycobacterium caprae*, clinical picture, main pathological changes, culture protocol, PCR identification, tuberculin test, gamma interferon tests.

Kubica, Tanja; Agzamova, Rimma; Wright, Abigail; Rakishev, Galimzhan; Ruesch-Gerdes Sabine; Niemann, Stefan. ***Mycobacterium bovis* isolates with *M. tuberculosis* specific characteristics.** *Emerging Infectious Diseases*. 2006; 12 (5): 763-765. ISSN: 1080-6040.

**URL:** <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?linkbar=plain&db=journals&term=1080-6040>

**NAL Call Number:** RA648.5.E46

**Descriptors:** *Mycobacterium bovis* strains, some characteristics of *M. tuberculosis*, zoonotic isolates, humans, intermediate characteristics, Kazakhstan.

Lazzaro, B.P.; Galac, M.R. **Disease pathology: wasting energy fighting infection.** *Current Biology*. 2006; 16 (22): R964-R965. ISSN: 0960-9822

**URL:** <http://www.current-biology.com>

**Abstract:** *Drosophila melanogaster* infected with *Mycobacterium marinum* suffer metabolic wasting similar to that observed in humans suffering from tuberculosis. This wasting is linked to insulin signalling and hastens host death..

**Descriptors:** *Drosophila melanogaster*, effects of infection, wasting disease, *Mycobacterium marinum*.

Lee, Keun Wook; Jung, Jinwon; Lee, Younghee; Kim, Tae Yoon; Choi, Soo Young; Park, Jinseu; Kim, Doo Sik; Kwon, Hyung Joo.

**Immunostimulatory oligodeoxynucleotide isolated from genome wide screening of *Mycobacterium bovis* chromosomal DNA.** *Molecular Immunology*. 2006; 43 (13): 2107-2118. ISSN: 0161-5890.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/253/description](http://www.elsevier.com/wps/find/journaldescription.cws_home/253/description)

**NAL Call Number:** 448.3 IM62

**Descriptors:** bacterial DNA, immunostimulatory activity, *Mycobacterium bovis*, computer analysis of bacterial genome, activation of the NF-kappa B-responsive IL-8 promoter in RAW 264.7 cells.

Li, Jing Jing; Zhao, De Ming; Xu, Guang Xian; Zhou, Xiang Mei; Yin, Xiao Min. **Cloning and expression of *Mycobacterium bovis* secreted protein MPB83 in *Escherichia coli*.** *Journal of China Agricultural University*. 2006; 11 (6): 19-22. ISSN: 1007-4333. Note: In Chinese with an English summary.

**NAL Call Number:** S19.C58

**Descriptors:** *Mycobacterium bovis*, cloning of the MPB83 gene, analysis of its expression, SDS-PAGE and western blotting technique, possible diagnostic tool.

Lu, Jun Peng; Luo, Man Lin; Song, Yan Hua; Zou, Wei Li. **Expression of MPT83 gene from *Mycobacterium bovis* and purification of its recombinant protein.** *Veterinary Science in China*. 2006; 36(5): 366-370. ISSN: 1673-4696. Note: In Chinese with an English summary.  
**URL:** <http://www.zgsyky.com/>

**Descriptors:** *Mycobacterium bovis*, DAN extraction, MPT83 gene fragment amplified via PCR, cloned into plasmid pET-32a(+), transformed into BL21(DE3), recombinant protein.

Li, Rui Fang; Qin, Ai Jian; Xu, Jin Jun. **Preparation of the specific monoclonal antibody against bovine gamma -interferon and its properties.** *Chinese Journal of Zoonoses*. 2006; 22 (8): 755-758. ISSN: 1002-2694. Note: In Chinese with an English summary.

**Descriptors:** cattle, *Mycobacterium bovis*, monoclonal, antibody, fusion SP2/0 cells and immunized mice spleen cells, immunogen on BALB/c mice, BovIFN-gamma 4A3 BovIFN-gamma 4G5, use for surveillance and control of TB in milk cows.

Marcondes, A.G.; Shikama, M. de L.M.; Vasconcellos, S.A.; Benites, N.R.; Moraes, Z.M de; Roxo, E.; Dias, R.A.; Leao, S.L.P.C.; Pinheiro, S.R. **Comparacao entre a tecnica de cultivo em camada delgada de agar Middlebrook 7H11 e meio de Stonebrink para isolamento de *Mycobacterium bovis* em amostras de campo. [Microcolony detection of *Mycobacterium bovis* in Middlebrook 7H11 thin layer culture.]** *Brazilian Journal of Veterinary Research and Animal Science*. 2006; 43 (3): 362-369. ISSN: 1413-9596. Note: In Portuguese with an English summary.

**Descriptors:** bacterial morphology, *Mycobacterium bovis* AN5, *Mycobacterium tuberculosis* H37Rv, cultivation technique in thin layer of Middlebrook 7H11 (TL7H11).

Marri, Pradeep Reddy; Bannantine, John P.; Golding, Geoffrey B. **Comparative genomics of metabolic pathways in *Mycobacterium* species: gene duplication, gene decay and lateral gene transfer.** *FEMS Microbiology Reviews*. 2006 Nov; 30 (6): 906-925. ISSN: 0168-6445

**URL:** <http://dx.doi.org/10.1111/j.1574-6976.2006.00041.x>

**NAL Call Number:** QR1.F46

**Abstract:** The genus *Mycobacterium* comprises significant pathogenic species that infect both humans and animals. One species within this genus, *Mycobacterium tuberculosis*, is the primary killer of humans resulting from bacterial infections. Five mycobacterial genomes belonging to four different species (*M. tuberculosis*, *Mycobacterium bovis*, *Mycobacterium leprae* and *Mycobacterium avium* ssp. *paratuberculosis*) have been sequenced to date and another 14 mycobacterial genomes are at various stages of completion. A comparative analysis of the gene products of key metabolic pathways revealed that the major differences among these species are in the gene products constituting the cell wall and the gene families encoding the acidic glycine-rich (PE/PPE/PGS) proteins. *Mycobacterium leprae* has evolved by retaining a minimal gene set for most of the gene families, whereas *M. avium* ssp. *paratuberculosis* has acquired some of the virulence factors by lateral gene transfer.

**Descriptors:** *Mycobacterium* species, comparative genomics, biochemical pathways, pathogenicity.

Medina, Eva; Ryan, Lynn; LaCourse, Ronald; North, Robert J. **Superior virulence of *Mycobacterium bovis* over *Mycobacterium tuberculosis* (Mtb) for Mtb-resistant and Mtb-susceptible mice is manifest as an ability to cause extrapulmonary disease.** *Tuberculosis* (Amsterdam). 2006; 86 (1): 20-27. ISSN: 1472-9792

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/638428/description?navopenmenu=-2](http://www.elsevier.com/wps/find/journaldescription.cws_home/638428/description?navopenmenu=-2)

**Descriptors:** mouse disease model, BALB/c mice TB resistant, DBA/2 mice TB susceptible, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, both susceptible to *M. bovis*, intravenous route, progressive infection, pathology in kidneys, adrenal glands.

Megyeri, Klara; Buzas, Krisztina; Miczak, András; Buzas, Edit; Kovacs, László; Seprenyi, Gyrgy; Falus, Andras; Mandi, Yvette. **The role of histamine in the intracellular survival of *Mycobacterium bovis* BCG.** *Microbes and Infection*. 2006; 8 (4): 1035-1044. ISSN: 1286-4579.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/601557/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/601557/description#description)

**NAL Call Number:** QR180.M53

**Descriptors:** intracellular survival of *Mycobacterium bovis* BCG, murine bone marrow macrophages, wild type (WT) mice, histidine-decarboxylase knock-out [HDC (-/-)] mice, comparison study, histamine may moderate IL 18 production, immune protection.

Moisan, Jacques; Thuraingam, Thusanth; Henault, Jill; De Sanctis, Juan.; Radzioch, Danuta. **Role of SLC11A1 (formerly NRAMP1) in regulation of signal transduction induced by Toll-like receptor 7 ligands.** *FEMS Immunology and Medical Microbiology*. 2006; 47 (1): 138-147. ISSN: 0928-8244.

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0928-8244&site=1>

**NAL Call Number:** QR180.F46

**Descriptors:** treatment for infectious and allergic diseases, toll-like receptor ligands, TLR, *Mycobacterium bovis* BCG infection, synthetic TLR 7 ligand, splenic bacterial load, mouse model, macrophage cell lines of B10.A(Nramp1(r)) and B10.A(Nramp1(-/-)) mice, role for NRAMP1 in modulating p38 MAPK and PKC zeta activity, reduced cytokine induction by TLR7 ligands.

More, S.J.; Collins, J.D.; Gormley, E.; Good, M.; Skuce, R.A.; Pollock, J.M. **4th International Conference on *Mycobacterium bovis*: workshop reports.** *Veterinary Microbiology*. 2006; 112 (2/4): 383-391. ISSN: 0378-1135. Note: Special issue: S.J. More; J.D. Collins; E. Gormley; M. Good; R.A. Skuce; J.M. Pollock (editors). Proceedings of the 4th International Conference on *Mycobacterium bovis*, Dublin, Ireland, 22-26 August 2005.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** conference workshop reports, policy, strategy, *Mycobacterium bovis*, disease control, disease eradication programs, diagnosis, molecular epidemiology, wild animals as disease reservoirs, vaccines, vaccination of animals, cattle, livestock.

Morita, Yasu S.; Sena, Chubert B.C.; Waller, Ross F.; Kurokawa, Ken; Sernee, M. Fleur; Nakatani, Fumiki; Haïtes, Ruth E.; Billman-Jacobe, Helen;

McConville, Malcolm J.; Maeda, Yusuke; Kinoshita, Taroh **PimE Is a polyprenol-phosphate-mannose-dependent mannosyltransferase that transfers the fifth mannose of phosphatidylinositol mannoside in mycobacteria.** *Journal of Biological Chemistry*. 2006 Sept 1; 281 (35): 25143-25155. ISSN: 0021-9258

URL: <http://www.jbc.org/>

NAL Call Number: 381 J824

**Abstract:** Phosphatidylinositol mannosides (PIMs) are a major class of glycolipids in all mycobacteria. AcPIM2, a dimannosyl PIM, is both an end product and a precursor for polar PIMs, such as hexamannosyl PIM (AcPIM6) and the major cell wall lipoglycan, lipoarabinomannan (LAM). The mannosyltransferases that convert AcPIM2 to AcPIM6 or LAM are dependent on polyprenol-phosphate-mannose (PPM), but have not yet been characterized. Here, we identified a gene, termed pimE that is present in all mycobacteria, and is required for AcPIM6 biosynthesis. PimE was initially identified based on homology with eukaryotic PIG-M mannosyltransferases. PimE-deleted *Mycobacterium smegmatis* was defective in AcPIM6 synthesis, and accumulated the tetramannosyl PIM, AcPIM4. Loss of PimE had no effect on cell growth or viability, or the biosynthesis of other intracellular and cell wall glycans. However, changes in cell wall hydrophobicity and plasma membrane organization were detected, suggesting a role for AcPIM6 in the structural integrity of the cell wall and plasma membrane. These defects were corrected by ectopic expression of the pimE gene. Metabolic pulse-chase radiolabeling and cell-free PIM biosynthesis assays indicated that PimE catalyzes the (Sa)B1,2-mannosyl transfer for the AcPIM5 synthesis. Mutation of an Asp residue in PimE that is conserved in and required for the activity of human PIG-M resulted in loss of PIM-biosynthetic activity, indicating that PimE is the catalytic component. Finally, PimE was localized to a distinct membrane fraction enriched in AcPIM4-6 biosynthesis. Taken together, PimE represents the first PPM-dependent mannosyl-transferase shown to be involved in PIM biosynthesis, where it mediates the fifth mannose transfer.

**Descriptors:** *Mycobacterium*, phosphatidylinositol mannosides (PIMs), cell wall and plasma membrane changes and organization, polyprenol-phosphate-mannose (PPM).

Mustafa, A.S.; Skeiky, Y.A.; Al Attiyah, R.; Alderson, M.R.; Hewinson, R.G.; Vordermeier, H.M. **Immunogenicity of *Mycobacterium tuberculosis* antigens in *Mycobacterium bovis* BCG-vaccinated and *M. bovis*-infected cattle.** *Infection and immunity (IAI)*. 2006 Aug.; 74 (8): 4566-4572.

ISSN: 0019-9567

URL: <http://iai.asm.org/>

NAL Call Number: QR1.I57

**Abstract:** The development of novel vaccine strategies supplementing *Mycobacterium bovis* BCG (BCG) constitutes an urgent research challenge. To identify potential subunit vaccine candidates, we have tested a series of eight recently identified *Mycobacterium tuberculosis* antigens in *M. bovis*-infected and BCG-vaccinated cattle. These antigens were characterized on the basis of their ability to induce in vitro gamma interferon responses in infected or BCG-vaccinated calves. We were able to establish a hierarchy of these antigens based on how frequently they were recognized in both groups of animals. In particular, we were able to prioritize frequently recognized proteins like Rv0287, Rv1174, and Rv1196 for future evaluation as subunit vaccines to be used in BCG-protein heterologous prime-boost vaccination scenarios. In addition, the antigen most dominantly recognized in *M. bovis*-infected cattle in this study, Rv3616c, was significantly less frequently recognized by BCG vaccinees and could be a target to improve BCG, for example, by increasing its secretion, in a recombinant BCG vaccine.

**Descriptors:** cattle, vaccines, subunit vaccine candidates, eight *Mycobacterium tuberculosis* antigens, *Mycobacterium bovis*-infected and BCG-vaccinated cattle, Rv3616c antigen.

Naranjo, V.; Ayoubi, P.; Vicente, J.; Ruiz-Fons, F.; Gortazar, C.; Kocan, K.M.; De la Fuente, J. **Characterization of selected genes upregulated in non-tuberculous European wild boar as possible correlates of resistance to *Mycobacterium bovis* infection.** *Veterinary Microbiology*. 2006 Aug 25; 116 (1-3): 224-231. ISSN: 0378-1135

URL: <http://dx.doi.org/10.1016/j.vetmic.2006.03.013>

NAL Call Number: SF601.V44

**Abstract:** Bovine tuberculosis (bTB), caused by *Mycobacterium bovis* (*Mycobacterium tuberculosis* complex), is a zoonotic disease that affects cattle and wildlife worldwide. These animal hosts can serve as reservoirs of infection, thus increasing the risk of human exposure and infection. In this study we quantified by RNA macroarray fluorescent hybridization and real-time RT-PCR the mRNA levels of genes differentially expressed in oropharyngeal tonsils and mandibular lymph nodes of three and seven individual non-tuberculous and tuberculous wild boars naturally exposed to *M. bovis*, respectively. These results demonstrated upregulation of two genes, complement component 3 (C3) and methylmalonyl-CoA mutase (MUT), in the non-tuberculous wild boars. These upregulated genes may contribute to resistance of wild boars to bTB by modifying the innate immunity, which limits the ability of the mycobacterium to infect and persist within macrophages. The C3 and MUT genes, therefore, are likely to be good candidates to study as markers of bTB resistance using functional genomics in animal model systems. Identification of genes upregulated in wild animals resistant to bTB contributes to our understanding of the mechanisms of protective immunity and resistance to mycobacterial organisms.

**Descriptors:** *Mycobacterium bovis*, wild boars, wildlife disease reservoir, up regulated genes, resistant of boars to tuberculosis, limits *Mycobacterium* to infect and persist in macrophages.

Parra, Marcela; Cadieux, Nathalie; Pickett, Thames; Dheenadhayalan, Veerabadran; Brennan, Michael J. **A PE protein expressed by *Mycobacterium avium* is an effective T-cell immunogen.** *Infection and Immunity*. 2006 Jan; 74 (1): 786-789. ISSN: 0019-9567

URL: <http://iai.asm.org/>

NAL Call Number: QR1.I57

**Abstract:** Infection of mice with *Mycobacterium avium* or immunization with a novel PE gene expressed by *M. avium* (MaPE) showed that a dominant T-cell immune response was elicited. Immunization with an MaPE DNA vaccine protected mice against an aerosol challenge with *Mycobacterium tuberculosis*, suggesting that mycobacteria express PE antigens with cross-protective T-cell epitopes.

Pereira-Suarez, A.L.; Estrada-Chavez, C.; Arriaga-Diaz, C.; Espinosa-Cueto, P.; Mancilla, R. **Coexpression of NRAMP1, iNOS, and nitrotyrosine in bovine tuberculosis.** *Veterinary Pathology*. 2006; 43 (5): 709-717. ISSN: 0300-9858

URL: <http://www.acvp.org>

NAL Call Number: 41.8 P27

**Abstract:** In murine models the inducible nitric oxide synthase (iNOS) and the natural resistance associated macrophage protein (NRAMP1) play

major roles in host defence against mycobacteria. iNOS regulates nitric oxide (NO) production, which is noxious for ingested mycobacteria, and NRAMP1 displays pleiotropic antimicrobial effects, including upregulation of iNOS expression. Little is known about the role of these molecules in bovine tuberculosis (TB). In this work we demonstrate by Western blot a high expression of NRAMP1 in peripheral blood mononuclear cells (PBMCs), alveolar macrophages (obtained by bronchioalveolar lavage), and lymph node granulomas from 8 Holstein-Freisian cattle with autopsy-proven bovine TB. Immunohistochemistry revealed the abundant expression of NRAMP1 and iNOS in lymph node and lung granulomas.

Immunoreactivity was abundant in the cytoplasm of many epithelioid macrophages and multinucleated giant cells of the Langhans type. A striking accumulation of nitrotyrosine (NT), an indicator of iNOS activity and local NO production, was observed in granuloma cells, particularly in multinucleated Langhans cells. This study shows that the expression of NRAMP1 and iNOS is costimulated in granulomas, which are protective T-cell reactions against mycobacteria.

**Descriptors:** Holstein-Freisian cattle, murine model, lymph node granulomas, T cells, nitric oxide synthase; nitrotyrosine *Mycobacterium bovis*.

Pignone, Michelle; Greth, Kimberly M.; Cooper, Jason; Emerson, David; Tang, Jane. **Identification of mycobacteria by matrix-assisted laser desorption ionization-time-of-flight mass spectrometry.** *Journal of Clinical Microbiology*. 2006 June; 44 (6): 1963-1970. ISSN: 0095-1137

**URL:** <http://jcm.asm.org/cgi/content/full/44/6/1963>

**NAL Call Number:** QR46 .J6

**Abstract:** Classical methods for identification of *Mycobacterium* species rely on morphology and biochemical profiles. Speciation of a *Mycobacterium* isolate using these standard methods is a lengthy process based on subjective data interpretation. In this study, *Mycobacterium* species were characterized by utilizing matrix-assisted laser desorption ionization-time-of-flight mass spectrometry (MALDI-TOF MS). This technology is designed to provide a characteristic mass spectral fingerprint based on desorbed ions from the cell surface. Thirty-seven strains were analyzed; these represented thirteen species and five subspecies that included the *Mycobacterium tuberculosis* complex and the *M. avium M. intracellulare* complex, as well as rapid- and slow-growing mycobacteria. All 37 strains were analyzed in triplicate, and a database was generated.

This method produced species-specific patterns for all but 1 of the 37 isolates and provided reliable differentiation at the strain level. The data suggest that whole-cell MALDI-TOF MS has potential as a rapid and reproducible method for the identification and characterization of *Mycobacterium* species.

**Descriptors:** *Mycobacterium* species, speciation, characterized by mass spectrometry method, spectral fingerprint.

Pollock, J.M.; Rodgers, J.D.; Welsh, M.D.; McNair, J. **Pathogenesis of bovine tuberculosis: the role of experimental models of infection.**

*Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 141-150. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** In many countries, test-and-slaughter policies based on tuberculin skin testing have made a significant impact on the control of bovine tuberculosis (caused by infection with *Mycobacterium bovis*). However, in some countries these policies have not proved as effective and improved disease control strategies are required (including improved diagnostic tests and development of vaccines). The host pathogen interactions in bovine tuberculosis are very complex. While studies of the disease in naturally infected field cases of bovine tuberculosis have provided valuable information, detailed knowledge can also be gained through studies of disease models. A number of studies have developed *M. bovis* infection models employing a range of routes and challenge doses. An early objective was assessment of vaccine efficiency, and models of infection remain central to current work in this area. Development of the intra-nasal and intra-tracheal models have also advanced our understanding of the kinetics of the immune response. In many of these studies, understanding of pathogenesis has been improved by definition of the cells that respond to infection and those that are instrumental in modulation of host responses. Experimental models of infection have been adapted to study cattle to cattle transmission, modeling one of the fundamental routes of infection. This review provides a historical perspective on the types of experimental models used in over 100 years of research and outlines new opportunities to refine those methods for bovine and human tuberculosis and to contribute to improved diagnostics, advanced understanding of immunology and vaccine design.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, disease control, disease control programs, literature reviews, animal disease models, infection, disease diagnosis, analytical kits, vaccines, host pathogen relationships, pathogenesis, resistance mechanisms, disease transmission, humans, tuberculosis.

Rasololofo-Razanamparany, V.; Quirin, R.; Rapaoliarijaona, A.; Rakotoarilahina, H.; Vololonirina, E.J.; Rasolonava, T.; Ferdinand, S.; Sola, C.; Rastogi, N.; Ramarokoto, H. **Usefulness of restriction fragment length polymorphism and spoligotyping for epidemiological studies of *Mycobacterium bovis* in Madagascar: Description of new genotypes.** *Veterinary Microbiology*. 2006 Apr 16; 114 (1-2): 115-122. ISSN: 0378-1135

**URL:** <http://dx.doi.org/10.1016/j.vetmic.2005.11.057>

**NAL Call Number:** SF601.V44

**Abstract:** Tuberculosis is highly prevalent in cattle in Madagascar. An epidemiological study based on genotyping of *Mycobacterium bovis* and its transmission to humans was carried out. The restriction fragment length polymorphism (IS6110 and DR markers) and spoligotyping were used to assess the genetic diversity of strains from different regions of Madagascar. One of these strains was isolated from goat. The other strains were isolated from zebu cattle. Nine IS6110 profiles, 20 DR profiles and 12 spoligotypes were obtained. About 90% of all isolates gave a single IS6110 band at about 1.8 kb. Most strains had the same spoligotype. *M. bovis* strains commonly lack spacers 39-43, and all Malagasy strains also lacked spacers 3-5, 8-10 and 16. This pattern has not been reported elsewhere. DR was the most discriminatory of the three markers. The patterns obtained with the three markers were combined to identify 34 different genotypes, one of which was found in 35% of the strains. No region-specific *M. bovis* genotype was identified, but the genotyping of 18 *M. bovis* strains isolated from patients showed that the human and bovine strains were identical, suggesting possible human contamination from zebu cattle.

**Descriptors:** zebu cattle, *Mycobacterium bovis*, bovine tuberculosis, animal pathogenic bacteria, restriction fragment length polymorphism, epidemiology, genotype, strains, strain differences, microbial genetics, disease transmission, humans, zoonoses, goats, spoligotyping, Internet resource, Madagascar.

Razanamparany, V.R.; Quirin, R.; Rapaoliarijaona, A.; Rakotoarilahina, H.; Vololonirina, E. J.; Rasolonalavona, T; Ferdinand, S.; Sola, C.; Rastogi,

N.; Ramarokoto, H.; Chanteau, S. **Usefulness of restriction fragment length polymorphism and spoligotyping for epidemiological studies of *Mycobacterium bovis* in Madagascar: description of new genotypes.** *Veterinary Microbiology*. 2006; 114 (1/2): 115-122. ISSN: 0378-1135  
**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** Tuberculosis is highly prevalent in cattle in Madagascar. An epidemiological study based on genotyping of *Mycobacterium bovis* and its transmission to humans was carried out. The restriction fragment length polymorphism (IS6110 and DR markers) and spoligotyping were used to assess the genetic diversity of strains from different regions of Madagascar. One of these strains was isolated from goat, the other strains were isolated from zebu cattle. Nine IS6110 profiles, 20 DR profiles and 12 spoligotypes were obtained. About 90% of all isolates gave a single IS6110 band at about 1.8 kb. Most strains had the same spoligotype. *M. bovis* strains commonly lack spacers 39-43, and all Malagasy strains also lacked spacers 3-5, 8-10 and 16. This pattern has not been reported elsewhere. DR was the most discriminatory of the three markers. The patterns obtained with the three markers were combined to identify 34 different genotypes, one of which was found in 35% of the strains. No region-specific *M. bovis* genotype was identified, but the genotyping of 18 *M. bovis* strains isolated from patients showed that the human and bovine strains were identical, suggesting possible human contamination from zebu cattle.

**Descriptors:** Zebu cattle, *Mycobacterium bovis*, disease prevalence, disease transmission between animals and humans, epidemiology, spoligotyping, genetic diversity, genetic markers, genetic polymorphism, genotypes, microsatellites, zoonoses, Madagascar.

Ren, Huiping; Dover, Lynn G.; Islam, Salim T.; Alexander, David C.; Chen, Jeffrey M.; Besra, Gurdyal S.; Liu, Jun. **Identification of the lipooligosaccharide biosynthetic gene cluster from *Mycobacterium marinum*.** *Molecular Microbiology*. 2007; 63 (5): 1345-1359. ISSN: 0950-382X

**URL:** <http://www.blackwell-synergy.com/loi/mmi>

**Abstract:** Lipooligosaccharides (LOSs) are antigenic glycolipids that are present in some species of *Mycobacterium* including the Canetti strain of *M. tuberculosis*. The core LOS structures from several mycobacterial organisms have been established, but the biosynthetic pathways of LOSs remain unknown. In this study, we describe two transposon insertion mutants of *M. marinum* that exhibit altered colony morphology. Cell wall analysis reveals that the MRS1271 mutant is defective in the synthesis of LOS-II, whereas the MRS1178 mutant accumulates an intermediate between LOS-I and -II. The genetic lesions were localized to two genes, MM2309 and MM2332. MM2309 encodes a UDP-glucose dehydrogenase that is involved in the synthesis of D-xylose. MM2332 is predicted to encode a decarboxylase. These two genes and a previously identified *losA* gene are localized in a gene cluster likely to be involved in the biosynthesis of LOSs. Our results also show that LOSs play an important role in sliding motility, biofilm formation, and infection of host macrophages. Taken together, our studies have identified, for the first time, a LOS biosynthetic locus. This is an important step in assessing the differential distribution of LOSs among *Mycobacterium* species and understanding the role of LOSs in mycobacterial virulence.

**Descriptors:** glycolipids, mutants, *Mycobacterium marinum*, lipooligosaccharides.

Richter, Elvira; Reusch Gerdes, Sabine; Hillemann, Doris. **Evaluation of the genotype *Mycobacterium* assay for identification of mycobacterial species from cultures.** *Journal of Clinical Microbiology*. 2006 May; 44 (5): 1769-1775. ISSN: 0095-1137

**NAL Call Number:** QR46 .J6

**Abstract:** A new commercially available DNA strip assay (GenoType *Mycobacterium* CM/AS; Hain Lifescience, Nehren, Germany) was evaluated for the ability to differentiate mycobacterial species. The test is based on a PCR technique targeting a 23S rRNA gene region, followed by reverse hybridization and line probe technology. The GenoType CM is capable of identifying 23, the GenoType AS a further 14, species either alone or in combination with one or more species. Both tests were evaluated with 156 mycobacterial strains composed of 61 validly published species including different subspecies, 6 not validly published species, and 3 strains other than mycobacterial species. All strains were precharacterized by sequencing of the 5' region of the 16S rRNA gene and biochemical tests. In total, results for 151 strains were interpretable. Concordant results were obtained for 137 (92.6%) of 148 mycobacterial strains with the CM assay and 133 (89.9%) of 148 mycobacterial strains with the AS assay, and all three non-*Mycobacterium* species were identified.

**Descriptors:** *Mycobacterium* species, 2 diagnostic test strips, culture testing, species differentiation.

Robinson, Nirmal; Wolke, Martina; Ernestus, Karen; Plum, Georg. **A mycobacterial gene involved in synthesis of an outer cell envelope lipid is a key factor in prevention of phagosome maturation.** *Infection and Immunity* (IAI). 2007 Feb; 75 (2): 581-591. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** Virulent mycobacteria cause arrest of phagosome maturation as a part of their survival strategy in hosts. This process is mediated through multiple virulence factors, whose molecular nature remains elusive. Using *Mycobacterium marinum* as a model, we performed a genome-wide screen to identify mutants whose ability to inhibit phagosome maturation was impaired, and we succeeded in isolating a comprehensive set of mutants that were not able to occupy an early endosome-like phagosomal compartment in mammalian macrophages. Categorizing and ordering the multiple mutations according to their gene families demonstrated that the genes modulating the cell envelope are the principal factors in arresting phagosome maturation. In particular, we identified a novel gene, *pmiA*, which is capable of influencing the constitution of the cell envelope lipids, thereby leading to the phagosome maturation block. The *pmiA* mutant was not able to resist phagosome maturation and was severely attenuated in mice. Complementing the mutant with the wild-type gene restored the attenuated virulence to wild-type levels in mice.

**Descriptors:** *Mycobacterium marinum*, interference with phagosome maturation, screening for mutants, multiple mutations found, novel gene *pmiA*, affects cell envelope lipids, mouse model.

Romero, Beatriz; Aranaz, Alicia; Juan, Lucaia de; Alvarez, Julio; Bezos, Javier; Mateos, Ana; Gaomez-Mampaso, Enrique; Domainguez, Lucas. **Molecular epidemiology of multidrug-resistant *Mycobacterium bovis* Isolates with the same spoligotyping profile as isolates from animals.** *Journal of Clinical Microbiology* (JCM). 2006 Sept; 44 (9): 3405-3408. ISSN: 0095-1137

**URL:** <http://jcm.asm.org/cgi/content/full/44/6/1963>

**Abstract:** PCR-based characterization techniques have been adopted in most laboratories for *Mycobacterium bovis* typing. We report a molecular characterization of human multidrug-resistant *M. bovis* isolates and three bovine isolates that share the spoligotyping profile. The analysis of the direct repeat region showed that both groups differed in the presence of spacers not included in the current membrane. They were also distinguished

by two out of the nine mycobacterial interspersed repetitive unit variable-number tandem repeat loci tested, indicating that the human infection was not acquired from the cattle from which isolates were obtained. These results highlight that a combination of techniques is required for appropriate discrimination, even for those spoligotypes that have a low frequency.

**Descriptors:** *Mycobacterium bovis*, molecular characterization of human and bovine strains, spoligotyping profile, differences, interspersed repetitive unit variable number tandem repeat loci, methods.

Ren, Huiping; Dover, Lynn G.; Islam, Salim T.; Alexander, David C.; Chen, Jeffrey M.; Besra, Gurdyal S.; Liu, Jun. **Identification of the lipooligosaccharide biosynthetic gene cluster from *Mycobacterium marinum*.** *Molecular Microbiology*. 2007; 63 (5): 1345-1359. ISSN: 0950-382X

**URL:** <http://www.blackwell-synergy.com/loi/mmi>

**Abstract:** Lipooligosaccharides (LOSs) are antigenic glycolipids that are present in some species of *Mycobacterium* including the Canetti strain of *M. tuberculosis*. The core LOS structures from several mycobacterial organisms have been established, but the biosynthetic pathways of LOSs remain unknown. In this study, we describe two transposon insertion mutants of *M. marinum* that exhibit altered colony morphology. Cell wall analysis reveals that the MRS1271 mutant is defective in the synthesis of LOS-II, whereas the MRS1178 mutant accumulates an intermediate between LOS-I and -II. The genetic lesions were localized to two genes, MM2309 and MM2332. MM2309 encodes a UDP-glucose dehydrogenase that is involved in the synthesis of D-xylose. MM2332 is predicted to encode a decarboxylase. These two genes and a previously identified *losA* gene are localized in a gene cluster likely to be involved in the biosynthesis of LOSs. Our results also show that LOSs play an important role in sliding motility, biofilm formation, and infection of host macrophages. Taken together, our studies have identified, for the first time, a LOS biosynthetic locus. This is an important step in assessing the differential distribution of LOSs among *Mycobacterium* species and understanding the role of LOSs in mycobacterial virulence.

**Descriptors:** glycolipids, mutants, *Mycobacterium marinum*, lipooligosaccharides.

Rosenthal, K.L. **Microbiology: revisiting the gram stain and culture.** *Small Animal and Exotics Proceedings of the North American Veterinary Conference, Volume 20, Orlando, Florida, USA, 7-11 January, 2006*. 2006: 1575-1577

**URL:** <http://www.tnavc.org>

**Descriptors:** pet birds, bacterial infections, *Enterococcus*, *Escherichia coli*, *Klebsiella*, *Mycobacterium*, *Mycoplasma*, *Proteus*, *Pseudomonas*, *Staphylococcus aureus*, *Chlamydia*, Gram stain, culture methods.

Rothschild, B.M.; Martin, L.D. **Did ice-age bovids spread tuberculosis?** *Naturwissenschaften*. 2006; 93 (11): 565-569. ISSN: 0028-1042

**URL:** <http://www.springerlink.com/link.asp?id=100479>

**Abstract:** Postcranial artiodactyl, perissodactyl, and carnivore skeletons were examined in major university and museum collections of North America and Europe for evidence of this and other pathology potentially attributable to tuberculosis. The relationships of the proboscidean examples need further study, but present evidence suggests a Holarctic spread of tuberculosis during the Pleistocene, with bovids acting as vectors. While the role of other animals in the transmission of tuberculosis could be considered, the unique accommodation achieved by bovids and mastodons makes them the likely "culprits" in its spread.

**Descriptors:** paleontology, *Mycobacterium bovis*, paleozoology, bone destruction and lesions; skeletons of artiodactyls, perissodactyls, and carnivores, fossil bones, museum specimens, prehistoric vectors of bovine *Mycobacterium*, North America; Europe.

Rothschild, B.M.; Laub, R. **Hyperdisease in the late Pleistocene: validation of an early 20th century hypothesis.** *Naturwissenschaften*. 2006; 93 (11): 557-564. ISSN: 0028-1042

**URL:** <http://www.springerlink.com/link.asp?id=100479>

**Abstract:** The hypothesis of disease-related large mammal extinction has new support. A unique pathologic zone of resorption in 52% of metacarpals and metatarsals was first noticed in a 113 skeletons of Hiscock *Mammuth americanus* metacarpals. There was also associated rib periosteal reaction that is suggestive of tuberculosis. Foot lesions were identical to that documented in *Bison* as pathognomonic for tuberculosis. The high frequency of the pathology in *M. americanus* suggests that tuberculosis was pandemic, a hyperdisease. Such pandemic tuberculosis could have been one of several factors contributing to mastodon extinction.

**Descriptors:** paleozoology, fossils, mammals, *Mycobacterium tuberculosis*, bacterial infections in feet bones, bacterioses, bone destruction, *Mammuth americanus*, Pleistocene era.

Rosseels, Valerie; Marche, Sylvie; Roupie, Virginie; Govaerts, Marc; Godfroid, Jacques; Walravens, Karl; Huygen, Kris. **Members of the 30- to 32-kilodalton mycolyl transferase family (Ag85) from culture filtrate of *Mycobacterium avium* subsp. *paratuberculosis* are immunodominant Th1-type antigens recognized early upon infection in mice and cattle.** *Infection and Immunity*. 2006 Jan; 74 (1): 202-212. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The characterization of protective antigens is essential for the development of an effective, subunit-based vaccine against paratuberculosis. Surface-exposed and secreted antigens, present abundantly in mycobacterial culture filtrate (CF), are among the well-known protective antigens of *Mycobacterium tuberculosis* and *Mycobacterium bovis*. Culture filtrate, prepared from *Mycobacterium avium* subsp. *paratuberculosis* ATCC 19698 grown as a surface pellicle on synthetic Sauton medium, was strongly and early recognized in experimentally infected B6 bg/bg beige mice and cattle, as indicated by elevated spleen cell gamma interferon (IFN- $\gamma$ ) secretion and lympho-proliferative responses of peripheral blood mononuclear cells, respectively. Strong proliferative and ex vivo IFN- $\gamma$  responses against antigen 85 (Ag85) complex (a major protein component from *M. bovis* BCG culture filtrate) could be detected in cattle as early as 10 weeks after oral *M. avium* subsp. *paratuberculosis* infection. Synthetic peptides from the Ag85A and Ag85B components of this complex were strongly recognized, whereas T-cell responses were weaker against peptides from the Ag85C protein. A promiscuous T-cell epitope spanning amino acids 145 to 162 of Ag85B (identical sequence in *M. bovis* and *M. avium* subsp. *paratuberculosis*) was identified in experimentally infected cattle. Finally, young calves, born from cows with confirmed paratuberculosis, demonstrated proliferative responses to purified, recombinant Ag85A and Ag85B from *M. avium* subsp. *paratuberculosis*. These results indicate that the *M. avium* subsp. *paratuberculosis* Ag85 homologues are immunodominant T-cell antigens that are recognized early in experimental and natural infection of cattle.

**Descriptors:** cattle, *Mycobacterium avium paratuberculosis*, *Mycobacterium bovis*, protective antigens, synthetic Sauton medium, cultural filtrate, experimentally infections, B6 bg/bg beige mice. cattle, elevated spleen cell gamma interferon (IFN-[gamma]) secretion, lympho-proliferative responses of peripheral blood mononuclear cells, Ag85 homologues.

Rybniker, Jan; Kramme, Stefanie; Small, Pamela L. **Host range of 14 mycobacteriophages in *Mycobacterium ulcerans* and seven other mycobacteria including *Mycobacterium tuberculosis* - application for identification and susceptibility testing.** *Journal of Medical Microbiology*. 2006; 55(1): 37-42. ISSN: 0022-2615

**URL:** <http://jmm.sgmjournals.org/contents-by-date.0.shtml>

**NAL Call Number:** QR1.J62

**Descriptors:** *Mycobacterium bovis* strain BCG Pasteur; *Mycobacterium ulcerans* strain M18, strain-RifR, strain, clinical-isolates, strain 1615 mycolactone--mutant, strain-1615 (ATCC-35840), strain S12; *Mycobacterium tuberculosis* strain H37Rv, strain-371, strain BCG-Pasteur; *Mycobacterium avium* strain 702, strain 701, strain 3746-02; *Mycobacterium marinum* strain 565, strain ATCC-927; *Mycobacterium scrofulaceum* strain 1315, strain 1320; *Mycobacterium fortuitum* strain 1529; *Mycobacterium chelonae* strain 1543; *Mycobacterium smegmatis* strain mc-2-155; mycobacteriophage strain TM4, strain D29, phage therapy.

Santillan-Flores, M.A.; Flores, J.; Arriaga-Diaz, C.; Romero-Torres, C.; Suarez-Guemes, F.; Espitia, C. **Polymorphism of the PE domain of PE/PE\_PGRS sequences in clinical isolates of *Mycobacterium bovis* in Mexico .** *Veterinary Microbiology*. 2006 July 20; 115 (4): 364-369. ISSN: 0378-1135

**URL:** <http://dx.doi.org/10.1016/j.vetmic.2006.02.021>

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** Polymorphism of the PE domain of PE/PE\_PGRS sequences was studied in *Mycobacterium bovis* isolates from different Mexican states. Samples were analyzed by spoligotyping and RFLP using IS6110 and a 235-bp fragment of the PE domain of PE/PE\_PGRS as probes. With the PE probe, three different genotypes were observed, one being predominant in all states. These results confirm the high conservation of the PE domain and suggests a potential role for PE sequence as a stable genetic marker for bovine tuberculosis.

**Descriptors:** *Mycobacterium bovis*, RFLP, microbial genetics, bacterial proteins, mycobacterial diseases, multigene family, genes, genotype, genetic variation, genetic markers, nucleotide sequences, amino acid sequences, spoligotyping, molecular sequence data, Mexico.

Savelkoul, Paul H.M.; Catsburg, Arnold; Mulder, Sije; Oostendorp, Ludo; Schirm, Jurjen; Wilke, Hans; van der Zanden, Adri G.M.; Noordhoek, Gerda T. **Detection of *Mycobacterium tuberculosis* complex with Real Time PCR: comparison of different primer-probe sets based on the IS6110 element.** *Journal of Microbiological Methods*. 2006; 66 (1): 177-180. ISSN: 0167-7012

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/506034/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/506034/description#description)

**NAL Call Number:** QR65.J68

**Descriptors:** diagnostic testing, sensitivity and specificity, real time PCR: real-time-polymerase-chain-reaction, laboratory techniques, genetic techniques, TaqMan, laboratory equipment, express software package, minor groove binding probe, four real time PCR prime probe sets, *Mycobacterium tuberculosis*, *Mycobacterium avium*, *Mycobacterium intracellulare*, *Mycobacterium kansasii*, *Mycobacterium fortuitum*, *Mycobacterium bovis*, *Mycobacterium gordonae*, *Mycobacterium xenopi*, *Mycobacterium smegmatis* strain 1008, *Mycobacterium cordense*, *Mycobacterium senegalense*, *Nocardia farcinica*.

Shah, N.P.; Singhal, A.; Jain, A.; Kumar, P.; Uppal, S.S.; Srivatsava, M.V.P.; Prasad, H.K. **Occurrence of overlooked zoonotic tuberculosis: detection of *Mycobacterium bovis* in human cerebrospinal fluid.** *Journal of Clinical Microbiology*. 2006 Apr; 44 (4) 1352-1358. ISSN: 0095-1137

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1489394>

**NAL Call Number:** QR46.J6

**Abstract:** The paucibacillary nature of the cerebrospinal fluid (CSF) has been a major obstacle in the diagnosis of human tuberculous meningitis (TBM). This study shows that with molecular techniques direct precise determination to the species level of mycobacterial pathogens can be made. The present report describes the utility of a nested PCR (N-PCR) assay (A. Mishra, A. Singhal, D. S. Chauhan, V. M. Katoch, K. Srivastava, S. S. Thakral, S. S. Bhargadwaj, V. Sreenivas, and H. K. Prasad, *J. Clin. Microbiol.* 43:5670-5678, 2005) in detecting *M. tuberculosis* and *M. bovis* in human CSF. In 2.8% (6/212) of the samples, *M. tuberculosis* was detected, and in 17% (36/212), *M. bovis* was detected. Mixed infection was observed in 22 samples. Comparative analysis of clinical diagnosis, smear microscopy, and N-PCR in 69 patients (TBM, 25; non-TBM, 44) showed that the sensitivity of N-PCR (61.5%) was greater than that of smear microscopy (38.4%). Determination to the species level is important from the viewpoint of determining the prevalence of these mycobacteria in a community and would influence strategies currently adopted for the prevention of tuberculosis.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, differential diagnostic techniques, zoonotic diseases, epidemiology, prevalence, disease prevention, nested PCR assay, utility of assay.

Slinina, K.N.; Lazovskaya, A.L. Vorob'eva, Z.G.; Kul'chitskaya, M.A.; Druchkova, M.V. **A method for storage of cultures in the laboratory.** *Russian Agricultural Sciences*. 2006; (12): 24-25. ISSN: 1068-3674. Note: Translated journal.

**NAL Call Number:** S1.S68

**Descriptors:** storage methods, bacterial species, *Escherichia coli*, *Enterococcus faecalis*, *Mycobacterium smegmatis*, *Mycobacterium avium* strains, preservation of biochemical characteristics and properties.

Smith, N.H.; Gordon, S.V.; Rua-Domenech, R. de la; Clifton-Hadley, R.S.; Hewinson, R.G. **Bottlenecks and broomsticks: the molecular evolution of *Mycobacterium bovis*.** *Nature Reviews Microbiology*. 2006; 4(9): 670-681. ISSN: 1740-1526

**URL:** <http://www.nature.com/reviews>

**Descriptors:** *Mycobacterium bovis*, cattle tuberculosis, reduction in diversity, population bottlenecks, selective sweeps, shaping of phylogeny, British Isles populations, spread of infection, improved vaccines, diagnostic, tests, UK.

Teixeira, Francisco M.; Teixeira, Henrique C.; Ferreira, Ana Paula; Rodrigues, Michele F.; Azevedo, Vasco; Macedo, Gilson C.; Oliveira, Sergio C. **DNA vaccine using *Mycobacterium bovis* Ag85B antigen induces partial protection against experimental infection in BALB/c mice.** *Clinical and Vaccine Immunology*. 2006; 13(8): 930-935. ISSN: 1556-6811

**URL:** <http://cvi.asm.org/>

**NAL Call Number:** RB 46.5

**Descriptors:** bovine tuberculosis, *Mycobacterium bovis*, mouse model, Ag85B gene as a DNA vaccine, challenge with *Mybacterium bovis* virulent strain (ATCC 19274), induction a Th1 type of immune response, spleens, lungs.

Thoen, C.; LoBue, P.; Kantor, I. de. **The importance of *Mycobacterium bovis* as a zoonosis.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 339-345. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** *Mycobacterium bovis* and closely associated acid-fast bacilli cause disease in humans. Epidemiologic investigations reveal that the organism may be ingested or inhaled. Extra pulmonary lesions may occur associated to the consumption of infected milk, even though with the practice of boiling milk, and the growth of milk pasteurization plants all over the world, the digestive route of infection became less important. On the other hand, airborne infection continues to occur among meat industry and slaughterhouse workers, in regions where the infection is still prevalent in cattle. Evidence of person to person transmission is rare. Main causes of concern related to *M. bovis* in industrialized countries are: epizootics in domesticated and wild mammals and latent infection in immigrants. Although multi-drug-resistant (MDR) strains of *M. bovis* have been identified, case reports reveal that anti-tuberculosis drugs routinely used to treat *Mycobacterium tuberculosis*-infected patients are effective when properly administered.

**Descriptors:** cattle, food animals, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, zoonoses, humans, tuberculosis, disease transmission, lesions animal, health hazards, occupational health and safety, livestock and meat industry, slaughterhouses, disease outbreaks, wild animals, latent period, multiple drug resistance, asymptomatic infections.

Tobler, Nadia E.; Pfunder, Monika; Herzog, Katrin; Frey, Juerg E.; Altwegg, Martin. **Rapid detection and species identification of *Mycobacterium* spp. using real-time PCR and DNA-Microarray.** *Journal of Microbiological Methods*. 2006; 66 (1): 116-124. ISSN: 0167-7012.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/506034/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/506034/description#description)

**NAL Call Number:** QR65.J68

**Descriptors:** *Mycobacterium*, 37 different species, identification procedure, 5' exonuclease real-time PCR, DNA microarray based on the region upstream of 65 kDa heat shock protein, may be good for mixed infections as well, *Mycobacterium leprae*, *Mycobacterium abscessus*, *Mycobacterium bovis*, *Mycobacterium intracellulare*, *Mycobacterium fortuitum*, *Mycobacterium haemophilum*, *Mycobacterium lentiflavum*, *Mycobacterium chelonae*, *Mycobacterium gordonae*, *Mycobacterium africanum*, *Mycobacterium avium* ssp *paratuberculosis*, *Mycobacterium malmoeense*, *Mycobacterium avium avium*, *Mycobacterium genavense*, *Mycobacterium celatum*, *Mycobacterium canettii*, *Mycobacterium alvei*, *Mycobacterium heckenshornense*, *Mycobacterium heidelbergense*.

Ung, Korine S E; Av Gay, Yossef. **Mycothioli-dependent mycobacterial response to oxidative stress.** *FEBS Letters*. 2006; 580 (11): 2712-2716. ISSN: 0014-5793

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/506085/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/506085/description#description)

**NAL Call Number:** QD415.F4

**Descriptors:** mycobacteria, *Mycobacterium bovis* BCG, *Mycobacterium smegmatis*, esogenous oxidative stress, MSH levels, thiol-specific oxidant diamide, hydrogen peroxide.

Viana-Niero, Cristina; Rosales-Rodriguez, Cesar Alejandro; Bigi, Fabiana; Santos-Zanini, Marcos; Ferreira-Neto, Jose Soares; Cataldi, Angel; Leao, Sylvia Cardoso. **Identification of an IS6110 insertion site in plcD, the unique phospholipase C gene of *Mycobacterium bovis*.** *Journal of Medical Microbiology*. 2006; 55 (4): 451-457. ISSN: 0022-2615

**URL:** <http://jmm.sgmjournals.org/contents-by-date.0.shtml>

**NAL Call Number:** QR1.J62

**Descriptors:** phospholipase C genes, plcA, plcB, plcC, plcD genes, IS6110 single copy, IS6110 transposon, PCR, Southern blot hybridization and sequencing analysis, *Mycobacterium tuberculosis* complex, PvuII fragment, *Mycobacterium bovis*, *Mycobacterium africanum*, *Mycobacterium canettii*, *Mycobacterium microti*.

Vitale, Fabrizio; Reale, Stefano; Petrotta, Enrico; Caracappa, Santo; Barera, Annalisa; La Manna, Marco Pio; Macaluso, Pasquale; Caccamo, Nadia; Dieli, Francesco; Vordermeier, Hans Martin; Sireci, Guido; Salerno, Alfredo. **ESAT-6 peptide recognition by bovine CD8(+) lymphocytes of naturally infected cows in herds from southern Italy.** *Clinical and Vaccine Immunology*. 2006; 13 (4): 530-533. ISSN:

**URL:** <http://cvi.asm.org/>

**NAL Call Number:** RB46.5

**Descriptors:** define epitopes of *Mycobacterium bovis* from ESAT-6 (early secretory antigen of 6 kDa) recognized by CD8(+) T lymphocytes from cows naturally infected with *Mycobacterium bovis*, bovine CD8' T cells recognized 10 out of 11 ESAT-6 peptides tested.

Waddington, K. **The Bovine Scourge: Meat, Tuberculosis and Public Health, 1850-1914.** Boydell Press. Suffock, UK2006; i-ix + 226 pp. ISBN: 1843831937. Note: A book with 10 chapters on the topic of meat and TB.

**NAL Call Number:** SF967.T8 W33 2006

**Descriptors:** bovine tuberculosis, public health, food safety concerns, meat from infected cattle, transmissibility between species and humans, meat inspection, eradication, etc.

Walravens, K.; Allix, C.; Supply, P.; Rigouts, L.; Godfroid, J.; Govaerts, M.; Portaels, F.; Dufey, J.; Vanholme, L.; Fauville-Dufaux, M.; Saegerman, C. **Apports du genotypage des souches de *Mycobacterium bovis* a l'analyse de l'epidemiologie de la tuberculose bovine en Belgique (1995-**

2005). [Genotyping of the strains of *Mycobacterium bovis* isolated in Belgium (1995-2005).] *Rencontres Autour des Recherches sur les Ruminants*. 2006; 13: 407-410. ISSN: 1279-6530. Note: In French.

**Descriptors:** cattle, *Mycobacterium bovis* pathogen, molecular typing of isolates, strains, restriction techniques, fragment length polymorphism (RFLP IS6110) and spoligotyping, mycobacterial interspersed repetitive units, variable number tandem repeat analysis (MIRU-VNTR), 40 genotypes, 12 lineages, epidemiology, Belgium.

Wedlock, D.N.; Kawakami, R.P.; Koach, J.; Buddle, B.M.; Collins, D.M. **Differences of gene expression in bovine alveolar macrophages infected with virulent and attenuated isogenic strains of *Mycobacterium bovis*.** *International Immunopharmacology*. 2006; 6 (6): 957-961. ISSN: 1567-5769.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/621330/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/621330/description#description)

**NAL Call Number:** QR180.I52

**Descriptors:** DNA microarray analysis to detect genes expressed in infected bovine lung alveolar macrophages, two isogenic strains of *M. bovis*, virulent strain ATCC35723, attenuated strain WAg520 derived from ATCC35723, chemokines, interleukin 8, monocyte chemotactic protein 1, identification of key genes, early and protective immune responses to tuberculosis.

## 2005

Amadio, Ariel; Romano, Maria-Isabel; Bigi, Fabiana; Etchehoury, Ignacio; Kubica, Tanja; Niemann, Stefan; Cataldi, Angel; Caimi, Karina.

**Identification and characterization of genomic variations between *Mycobacterium bovis* and *M. tuberculosis* H37Rv.** *Journal of Clinical Microbiology*. 2005; 43 (5): 2481-2484. ISSN: 0095-1137

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1489394>

**NAL Call Number:** QR46.J6

**Abstract:** Genetic differences between *Mycobacterium bovis* and *M. tuberculosis* were identified. We found (i) a deletion of Rv3479 specific to *M. bovis*, (ii) that the rpfA gene is shortened to various extents in *M. bovis*, and (iii) an insertion in Rv0648 and a duplication of lppA common in *M. tuberculosis* complex isolates.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, genetic differences, gene deletions, gene shortenings, insertion gene, duplication of common *M. tuberculosis* complex.

Amadio, A.; Romano, M.I.; Bigi, F.; Etchehoury, I.; Kubica, T.; Niemann, S.; Cataldi, A.; Caimi, K. **Identification and characterization of genomic variations between *Mycobacterium bovis* and *M. tuberculosis* H37Rv.** *Journal of Clinical Microbiology*. 2005; 43 (5): 2481-2484. ISSN: 0095-1137

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1489394>

**NAL Call Number:** QR46.J6

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, genetic analysis, transposable elements, genetic deletions, deletion of Rv3479 specific to *M. bovis*, rpfA gene is shortened to various extents in *Mycobacterium bovis*, insertion in Rv0648 and a duplication of lppA common in *Mycobacterium tuberculosis* complex isolates.

Bakshi, C.S.; Shah, D.H.; Verma, Rishendra; Singh, R.K.; Malik, Meenakshi. **Rapid differentiation of *Mycobacterium bovis* and *Mycobacterium tuberculosis* based on a 12.7-kb fragment by a single tube multiplex-PCR.** *Veterinary Microbiology*. 2005; 109 (3-4): 211-216. ISSN: 0378-1135

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** The aim of this work was the design and validation of a rapid and easy single tube multiplex-PCR (m-PCR) assay for the unequivocal differential detection of *Mycobacterium bovis* and *Mycobacterium tuberculosis*. Oligonucleotide primers were based on the uninterrupted 229-bp sequence in the *M. bovis* genome and a unique 12.7-kb insertion sequence from the *M. tuberculosis* genome, which is responsible for species-specific genomic polymorphism between these two closely related pathogens. The m-PCR assay was optimized and validated using 22 *M. bovis* and 36 *M. tuberculosis* clinical strains isolated from diverse host species and 9 other non-tuberculous mycobacterial (NTM) strains. The designed primers invariably amplified a unique 168-bp (*M. bovis*-specific) and 337-bp (*M. tuberculosis*-specific) amplicon from *M. bovis* and *M. tuberculosis* strains, respectively. The accuracy of the assay, in terms of specificity, was 100%, as none of the NTM strains tested revealed any amplification product. As little as 20 pg of genomic DNA could be detected, justifying the sensitivity of the method. The m-PCR assay is an extremely useful, simple, reliable and rapid method for routine differential identification of cultures of *M. bovis* and *M. tuberculosis*. This m-PCR may be a valuable diagnostic tool in areas of endemicity, where bovine and human tuberculosis coexist, and the distinction of *M. bovis* from *M. tuberculosis* is required for monitoring the spread of *M. bovis* to humans.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, differential diagnosis, PCR assay technique.

Biet, Franck; Boschioli, Maria Laura; Thorel, Marie Francoise; Guilloteau, Laurence A. **Zoonotic aspects of *Mycobacterium bovis* and *Mycobacterium avium-intracellulare* complex (MAC).** *Veterinary Research (Les Ulis)*. 2005; 36(3): 411-436. ISSN: 0928-4249.

**URL:** <http://www.edpsciences.org/journal/index.cfm?edpsname=vetres>

**NAL Call Number:** SF602.A5

**Descriptors:** *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium avium* ssp. *avium*, *Mycobacterium intracellulare* complex, epidemiology, zoonotic diseases, transmission between environment and wildlife, etiology, possibilities of control and management, Europe, North America, New Zealand.

Bigi, Fabiana; Garcia-Pelayo, M. Carmen; Nunez-Garcia, Javier; Peralta, Andrea; Caimi, Karina C.; Golby, Paul; Hinds, Jason; Cataldi, Angel; Gordon, Stephen V.; Romano, Maria I. **Identification of genetic markers for *Mycobacterium pinnipedii* through genome analysis.** *FEMS Microbiology Letters*. 2005; 248 (2): 147-152. ISSN: 0378-1097

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/506058/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/506058/description#description)

**NAL Call Number:** QR1.F44

**Descriptors:** seals, *Mycobacterium pinnipedii*, genetic variability with *Mycobacterium bovis*, microarray-based comparative genomics, 2 deletions identified, *M. tuberculosis* genes, PiD1--Rv3530c and Rv3531c, PiD2--Rv1977 and Rv1978.

Bigi, F.; Gioffre, A.; Klepp, L.; Santangelo, M.P.; Velicovsky, C.A.; Giambartolomei, G.H.; Fossati, C.A.; Romano, M.I.; Mendum, T.; McFadden, J.J.; Cataldi, A. **Mutation in the P36 gene of *Mycobacterium bovis* provokes attenuation of the bacillus in a mouse model.** *Tuberculosis* (Amsterdam). 2005; 85 (4): 221-226. ISSN: 1472-9792

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/638428/description?navopenmenu=-2](http://www.elsevier.com/wps/find/journaldescription.cws_home/638428/description?navopenmenu=-2)

**Descriptors:** *Mycobacterium tuberculosis*, *Mycobacterium bovis*, P36 proteins, putative virulence factor of wild type pathogen, mouse model.

Burguiere, Adeline; Hitchen, Paul G; Dover, Lynn G; Kremer, Laurent; Ridell, Malin; Alexander, David C.; Liu, Jun; Morris, Howard R.; Minnikin, David E.; Dell, Anne; Besra, Gurdyal S. **LosA, a key glycosyltransferase involved in the biosynthesis of a novel family of glycosylated acyltrehalose lipooligosaccharides from *Mycobacterium marinum*.** *Journal of Biological Chemistry*. 2005 Dec 23; 280 (51): 42124-42133. ISSN: 0021-9258

**URL:** <http://www.jbc.org/>

**NAL Call Number:** 381 J824

**Abstract:** Members of the genus *Mycobacterium* are characterized by cell envelopes rich in unusual free lipids, interacting with a covalently anchored mycolyl-arabinogalactan matrix. Previous studies have shown that *Mycobacterium marinum* produces large amounts of a diacylglycosylphenolphthiocerol, "phenolic" glycolipid. When cultivated on liquid Sauton medium, traces of a polar lipooligosaccharide (LOS) glycolipid antigen were also previously indicated. In this study, it was found that growth of the type strain of *M. marinum* on solid Sauton or Middlebrook 7H10 agar gave substantial, but different, amounts of a family of four major trehalose-based LOSs. The core pentasaccharide LOS-I was a rhamnosyl diglucosyl-acylated trehalose. The heptasaccharide, LOS-II, was derived from LOS-I by adding xylose accompanied by a novel sugar (X); repeated addition of this sugar unit X gave the octasaccharide LOS-III. LOS-IV has a decasaccharide component with two additional unusual sugar units, YZ. In a recent study (Alexander, D. C., Jones, J. R., Tan, T., Chen, J. M., and Liu, J. (2004) *J. Biol. Chem.* 279, 18824-18833), chromatographically similar glycolipids were assigned to the family of phosphatidylinositol mannosides (PIMs) and a "PimF" (Rv1500) glycosyltransferase implicated in the conversion of a supposed "PIM subscript 5" to a "PIM subscript 7." The present study indicates that these putative PIMs are in fact members of the phosphorus-free LOS family of glycolipids and that the protein product of Rv1500, which we have now termed LosA, is a glycosyltransferase involved in transferring sugars to LOS-III to form LOS-IV of *M. marinum*.

**Descriptors:** *Mycobacterium marinum*, cultured on solid Sauton medium, liquid Sauton medium, lipids, mycolyl-arabinogalactan matrix, putative PIMs.

Clifton-Hadley, R.S.; Inwald, J.; Archer, J.; Hughes, S.; Palmer, N.; Sayers, A.R.; Sweeney, K.; Embden, J.D.A. van; Hewinson, R.G. **Recent advances in DNA fingerprinting using spoligotyping - epidemiological applications in bovine TB.** *Cattle Practice*. 2005; 13 (4): 347-350. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, badgers (*Meles meles*), *Mycobacterium bovis* strains, molecular fingerprinting techniques, uses in epidemiology, UK.

Cobos-Marin, L.; Montes-Vargas, J.; Zumarraga, M.; Cataldi, A.; Romano, M.I.; Estrada-Garcia, I.; Gonzalez-y-Merchand, J.A. **Spoligotype analysis of *Mycobacterium bovis* isolates from Northern Mexico.** *Canadian Journal of Microbiology*. 2005 Nov.; 51 (11): 996-1000. Note: English; Summary in: French. ISSN: 0008-4166

**NAL Call Number:** 448.8 C162

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, strains, bovine tuberculosis, genetic techniques and protocols, polymerase chain reaction, loci, repetitive sequences, spoligotyping, spacer oligonucleotide typing, spoligotypes, Mexico.

Collins, Desmond A.; Skou, Bronwyn; White, Stefan; Bassett, Shalome; Collins, Lauren; For, Raewyn; Hurr, Kathryn; Hotter, Grant; de Lisle, Geoffrey W. **Generation of attenuated *Mycobacterium bovis* strains by signature-tagged mutagenesis for discovery of novel vaccine candidates.** *Infection and Immunity*. 2005; 73 (4): 2379-2386. ISSN: 0019-9567.

**URL:** <http://iai.asm.org>

**NAL Call Number:** QR1.I57

**Abstract:** *Mycobacterium bovis*, a member of the *Mycobacterium tuberculosis* complex, has a particularly wide host range and causes tuberculosis in most mammals, including humans. A signature tag mutagenesis approach, which employed illegitimate recombination and infection of guinea pigs, was applied to *M. bovis* to discover genes important for virulence and to find potential vaccine candidates. Fifteen attenuated mutants were identified, four of which produced no lesions when inoculated separately into guinea pigs. One of these four mutants had nine deleted genes including mmpL4 and sigK and, in guinea pigs with aerosol challenge, provided protection against tuberculosis at least equal to that of *M. bovis* BCG. Seven mutants had mutations near the esx4 (esat-6) locus, and immunoblot analysis of these confirmed the essential role of other genes at this locus in the secretion of EsxA (ESAT-6) and EsxB (CFP10). Mutations in the eight other attenuated mutants were widely spread through the chromosome and included pks1, which is naturally inactivated in clinical strains of *M. tuberculosis*. Many genes identified were different from those found by signature tag mutagenesis of *M. tuberculosis* by use of a mouse infection model and illustrate how the use of different approaches enables identification of a wider range of attenuating mutants.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis* complex, genes important for virulence, potential vaccine candidates, attenuated mutants, guinea pig animal model.

de Jong, Bouke C.; Onipede, Anthony; Pym, Alex S.; Gagneux, Sebastien; Aga, Roxanne S.; DeRiemer, Kathryn; Small, Peter M. **Does resistance to pyrazinamide accurately indicate the presence of *Mycobacterium bovis*.** *Journal of Clinical Microbiology*. 2005; 43 (7) 3530-3532. ISSN: 0095-1137

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1489394>

**NAL Call Number:** QR46.J6

**Abstract:** *Mycobacterium bovis* is best identified by screening those isolates of the *Mycobacterium tuberculosis* complex that have any pyrazinamide (PZA) resistance, using a confirmatory test such as spoligotyping, biochemical testing, or genomic deletion analysis. The sensitivity for detection of *M. bovis* is lowered to 82% when only PZA-monoresistant isolates are screened.

**Descriptors:** *Mycobacterium bovis*, isolate screening, pyrazinamide resistance, spoligotyping, biochemical testing, genomic deletion analysis.

Denis, M.; Buddle, B.M. **Iron modulates the replication of virulent *Mycobacterium bovis* in resting and activated bovine and possum macrophages.** *Veterinary Immunology and Immunopathology*. 2005; 107 (3-4): 189-199. ISSN: 0165-2427

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Descriptors:** *Mycobacterium bovis*, bacterial replication, in vitro testing, resting and activated possum macrophages, resting and activated bovine macrophages, iron modulating effects, virulent strains.

Denis, Michel; Wedlock, D. Neil; Buddle, Bryce M. **IFN-gamma enhances bovine macrophage responsiveness to *Mycobacterium bovis*: Impact on bacterial replication, cytokine release and macrophage apoptosis.** *Immunology and Cell Biology*. 2005; 83 (6): 643-650. ISSN: 0818-9641

**URL:** <http://www.blackwell-synergy.com/loi/icb>

**NAL Call Number:** QR180.I43

**Descriptors:** *Mycobacterium bovis*, bovine macrophages, effect of IFN-gamma, NO levels, IL-12, pro-inflammatory mediators, BCG infection, combination of IFN and LPS caused reduction of bacterial replication, apoptotic pathway, TNF alpha release.

Fujita, Yukiko; Naka, Takashi; Doi, Takeshi; Yano, Ikuya. **Direct molecular mass determination of trehalose monomycolate from 11 species of mycobacteria by MALDI-TOF mass spectrometry.** *Microbiology* (Reading). 2005; 151(Part 5): 1443-1452. ISSN: 1350-0872.

**URL:** <http://mic.sgmjournals.org/contents-by-date.0.shtml>

**NAL Call Number:** QR1.J65

**Descriptors:** mycobacteria, molecular mass of cell wall component, matrix assisted laser desorption/ionization time-of-flight mass spectrometry, numbers of carbons and double bonds, mycolic acid, species differences, *Mycobacterium tuberculosis*, *Mycobacterium bovis* wild and BCG strains, *Mycobacterium avium intracellulare* group, *Mycobacterium phlei*, *Mycobacterium flavescens*, procedure does not require degradation process.

Fujita, Y.; Naka, T.; McNeil, M.R.; Yano, I. **Intact molecular characterization of cord factor (trehalose 6,6'-dimycolate) from nine species of mycobacteria by MALDI-TOF mass spectrometry.** *Microbiology* (Reading). 2005; 151 (10): 3403-3416. ISSN: 1350-0872

**URL:** <http://mic.sgmjournals.org/contents-by-date.0.shtml>

**NAL Call Number:** QR1.J64

**Descriptors:** *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium kansasii*, *Mycobacterium phlei*, *Mycobacterium tuberculosis*, *Mycobacterium flavescens*, species differentiation, species characterization, molecular genetics, ions, molecular conformation, physicochemical properties, trehalose.

Gibson, Andrea; Brown, Timothy; Baker, Lucy; Drobniewski, Francis. **Can 15 locus mycobacterial interspersed repetitive unit-variable-number tandem repeat analysis provide insight into the evolution of *Mycobacterium tuberculosis*?** *Applied and Environmental Microbiology*. 2005 Dec.; 71 (12): 8207-8213. ISSN: 0099-2240

**URL:** <http://aem.asm.org/contents-by-date.0.shtml>

**NAL Call Number:** 448.3 Ap5

**Abstract:** The phylogeny and evolution of the bacterium *Mycobacterium tuberculosis* is still poorly understood despite the application of a variety of molecular techniques. We analyzed 469 *M. tuberculosis* and 49 *Mycobacterium bovis* isolates to evaluate if the mycobacterial interspersed repetitive units-variable-number tandem repeats (MIRU-VNTR) commonly used for epidemiological studies can define the phylogeny of the *M. tuberculosis* complex. This population was characterized by previously identified silent single-nucleotide polymorphisms (sSNPs) or by a macroarray based on these sSNPs that was developed in this study. MIRU-VNTR phylogenetic codes capable of differentiating between phylogenetic lineages were identified. Overall, there was 90.9% concordance between the lineages of isolates as defined by the MIRU-VNTR and sSNP analyses. The MIRU-VNTR phylogenetic code was unique to *M. bovis* and was not observed in any *M. tuberculosis* isolates. The codes were able to differentiate between different *M. tuberculosis* strain families such as Beijing, Delhi, and East African-Indian. Discrepant isolates with similar but not identical MIRU-VNTR codes often displayed a stepwise trend suggestive of bidirectional evolution. A lineage-specific panel of MIRU-VNTR can be used to subdivide each lineage for epidemiological purposes. MIRU-VNTR is a valuable tool for phylogenetic studies and could define an evolutionarily uncharacterized population of *M. tuberculosis* complex organisms.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis* complex, mycobacterial interspersed repetitive units-variable-number tandem repeats (MIRU-VNTR), phylogeny evolution of *M. tuberculosis* complex, macroarray based on these sSNPs, differentiating between strain families, bidirectional evolution, useful in epidemiology.

Guo, ShePing; Liu, SiGuo; Wang, ChunLai; Shao, MeiLi; Gong, Qiang; Liu, JianDong. **Prokaryotic expression of fusion gene mpb64-Ag85B of *Mycobacterium bovis* in *Escherichia coli*.** *Chinese Journal of Veterinary Science and Technology*. 2005; 35 (12): 946-949. ISSN: 1000-6419.

Note: In Chinese with an English summary.

**Descriptors:** cattle, *Mycobacterium bovis*, *E. coli*, genes, gene expression, gene splicing, Ag85B, mpb64.

Guo, MingXing; Zhang, HanXie; Chen, JianJun; Huang, Shen; Xu, GongHe; Chen, Ping. **Isolation and identification of *Mycobacterium bovis* from swine sources.** *Chinese Journal of Zoonoses*. 2005; 21(10): 920-922. ISSN: 1002-2694. Note: In Chinese with an English summary.

**Descriptors:** pigs, granulomatous lesions in various organs, disease outbreaks, case reports, diagnosis, *Mycobacterium bovis*, drug resistance, penicillins, rifampicin, streptomycin, susceptibility, Hubie, China.

Hilty, Markus; Diguimbaye, Colette; Schelling, Esther; Baggi, Franca; Tanner, Marcel; Zinsstag, Jakob. **Evaluation of the discriminatory power of variable number tandem repeat (VNTR) typing of *Mycobacterium bovis* strains.** *Veterinary Microbiology*. 2005; 109 (3-4): 217-222. ISSN:

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** The discriminatory power of variable number tandem repeat (VNTR) typing based on 16 known loci (12 MIRUs, 3 ETRs and VNTR 3232) was assessed for *Mycobacterium bovis* strains collected sequentially at the slaughterhouse of N'Djamena, Chad. Of 67 *M. bovis* strains analyzed, 67% were clustered. In this study, VNTR typing was highly discriminative with an overall allelic diversity ( $h(oa)$ ) of 0.922. We defined five loci (ETR A, B, C and MIRU 26, 27) as highly ( $h > 0.25$ ), two loci (MIRU 4, and VNTR 3232) as moderately ( $0.11 < h < 0.25$ ) and three loci (MIRU 16, 20, 31) as poorly ( $0.01 < h < 0.11$ ) discriminative. Six loci (MIRU 2, 10, 23, 24, 39, and 40) showed no polymorphism at all. VNTR typing of the five highly discriminative loci ( $h = 0.917$ ) proved to be most appropriate for first line typing of *M. bovis* strains of Chad and superior than spoligotyping ( $h(sp) = 0.789$ ). In contrast to *Mycobacterium tuberculosis* strains, a consensus on VNTR loci needs to be found for *M. bovis* strains. The selection of a generally agreed set of VNTR loci for molecular discrimination of *M. bovis* in different geographical settings is discussed.

**Descriptors:** cattle, *Mycobacterium bovis*, collected 67 strains at a slaughter house, allelic diversity, genetic polymorphism, N'Djamena, Chad.

Hope, J.C.; Stephens, S.A.; Charleston, B.; Sopp, P.; Howard, C.J. **Subsets of afferent lymph dendritic cells differ in their capacity to phagocytose *Mycobacterium bovis*.** *Immunology*. 2005; 116(Suppl. 1): 21. ISSN: 0019-2805. Note: A meeting abstract. Annual Congress of the British Society for Immunology, Harrogate, England; December 06-09, 2005

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0019-2805&site=1>

**NAL Call Number:** 448.3 IM6

**Descriptors:** *Mycobacterium bovis*, bacterial diseases, immunology, CD8 positive T-cell, CD4-positive-T-cell, afferent lymph dendritic cell, CD26, CD13, mannose receptor, expression, SIRP alpha, CD21, CD1b, expression, CD205, 187041-85-6, IL 10, secretion, interleukin 1 alpha, IL 12, secretion, phagocytosis.

Hughes, M.S.; Ball, N.W.; McCarroll, J.; Erskine, M.; Taylor, M.J.; Pollock, J.M.; Skuce, R.A.; Neill, S.D. **Molecular analyses of mycobacteria other than the *M. tuberculosis* complex isolated from Northern Ireland cattle.** *Veterinary Microbiology*. 2005; 108 (1/2): 101-112. ISSN: 0378-1135

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**Descriptors:** Northern Ireland cattle, mycobacteria isolates from bovine lymph nodes, PCR amplification of the 16S rRNA gene and reverse cross blot hybridization, sequence analyses, MPB70, MPB 64, ESAT-6, CFP 10, *Mycobacterium nonchromogenicum*, *Mycobacterium malmoense*, *Mycobacterium bohemicum*, *Mycobacterium paratuberculosis*, *Mycobacterium avium*, *Mycobacterium kansasii*, *Mycobacterium holsaticum*, *Mycobacterium palustre*, *Mycobacterium* sp. IWGMT 90210, *Mycobacterium* sp. LIV-2129, a potentially novel mycobacterial species (EMBL/GenBank/DBJ Accession Number AJ617495), UK.

Jiang Xiu yun; Wang Chun feng; Wang Chun fang; He Zhao yang. **Cloning and expression of *Mycobacterium bovis* secreted protein MPB51 in *Escherichia coli*.** *Weishengwu Xuebao*. 2005; 45 (2): 298-300. ISSN: 0001-6209. Note: In Chinese.

**Descriptors:** bovine tuberculosis, *Mycobacterium bovis* Vallee111 chromosomal DNA, PCR, genetic techniques, laboratory techniques, cloning, Western blot, ELISA, SDS-PAGE, MPB51 amplifies, plasmid generation, pET28a (+), pET28a-51transformed into competence *E. coli* BL21 (DE3), subunit vaccine, DNA vaccine.

Jiang, XiuYun; Wang, ChunFeng; Wang, ChunFang; He, ZhaoYang. **Expression of *Mycobacterium bovis* Ag85A gene in *Escherichia coli*.** *Chinese Journal of Veterinary Science and Technology*. 2005; 35(11): 875-878. ISSN: 1000-6419. Note: In Chinese with an English summary.

**Descriptors:** *Mycobacterium bovis*, *Escherichia coli*, DNA cloning, gene expression, genes, genetic transformation, plasmids, genetic vectors, antigens, nucleotide-sequences, plasmids, pGEM T 85A and pET28a(+), digested using BamH I, EcoR I.

Khalid-Sendide; Deghmane, A.E.; Pechkovsky, D; Av Gay, Y.; Talal, A.; Hmama, Z. ***Mycobacterium bovis* BCG attenuates surface expression of mature class II molecules through IL-10-dependent inhibition of cathepsin S.** *Journal of Immunology*. 2005; 175 (8): 5324-5332. ISSN: 0022-1767

**URL:** <http://www.jimmunol.org/>

**NAL Call Number:** 448.8 J8232

**Abstract:** We have previously shown that macrophage infection with *Mycobacterium tuberculosis* and *M. bovis* bacillus Calmette-Guerin (BCG) partially inhibits MHC class II surface expression in response to IFN-gamma. The present study examined the nature of class II molecules that do in fact reach the surface of infected cells. Immunostaining with specific abs that discriminate between mature and immature class II populations showed a predominance of invariant chain (Ii)-associated class II molecules at the surface of BCG-infected cells suggesting that mycobacteria specifically block the surface export of peptide-loaded class II molecules. This phenotype was due to inhibition of IFN-gamma-induced cathepsin S (Cat S) expression in infected cells and the subsequent intracellular accumulation of alpha beta class II dimers associated with the Cat S substrate Ii p10 fragment. In contrast, infection with BCG was shown to induce secretion of IL-10, and addition of blocking anti-IL-10 Ab to cell cultures restored both expression of active Cat S and export of mature class II molecules to the surface of infected cells. Consistent with these findings, expression of mature class II molecules was also restored in cells infected with BCG and transfected with active recombinant Cat S. Thus, *M. bovis* BCG exploits IL-10 induction to inhibit Cat S-dependent processing of Ii in human macrophages. This effect results in inhibition of peptide loading of class II molecules and in reduced presentation of mycobacterial peptides to CD4+ T cells. This ability may represent an effective mycobacterial strategy for eluding immune surveillance and persisting in the host.

**Descriptors:** humans, animal diseases, *Mycobacterium bovis* BCG, *Mycobacterium tuberculosis*, immune response, immunopathology, gene expression, interferon, interleukin 10, macrophages, cathepsins.

Koo, Hye Cheong; Park, Yong Ho; Ahn, Jongsam; Waters, W. Ray; Palmer, Mitch V.; Hamilton, Mary Jo; Barrington, George; Mosaad, Abdelaziz A.; Park, Kun Taek; Jung, Woo Kyung; Hwang, In Yeong; Cho, Sang Nae; Shin, Sang Jae; Davis, William C. **Use of rMPB70 protein and ESAT-6 peptide as antigens for comparison of the enzyme-linked immunosorbent, immunochromatographic, and latex bead agglutination assays for serodiagnosis of bovine tuberculosis.** *Journal of Clinical Microbiology*. 2005; Sep 43 (9) 4498-4506. ISSN: 0095-1137

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1489394>

**NAL Call Number:** QR46.J6

**Abstract:** Current assays used to detect *Mycobacterium bovis* infection lack accuracy, especially for recently infected animals, or are impractical for rapid field diagnostic applications. To overcome these limitations with serological assays, a synthetic peptide derived from early secretory antigenic target 6 (ESAT6-p) and a recombinant major secreted immunogenic protein (rMPB70) of *M. bovis* were used in an enzyme-linked immunosorbent assay (EIA), an immunochromatographic assay (ICGA), and a latex bead agglutination assay (LBAA). Sera from noninfected, *M. bovis*-infected, or *M. avium* subsp. *paratuberculosis*-infected (by natural and experimental routes) animals were evaluated. Receiver operating characteristic analysis comparing optical density values from the EIA with results of bacterial culture or skin test, the reference test, established suitable cutoff values for assessing sensitivity and specificity. The EIA and LBAA, respectively, had sensitivities of 98.6 and 94.8%, specificities of 98.5 and 92.6%, and kappa values of 0.97 and 0.88 with ESAT6-p. The EIA, ICGA, and LBAA, respectively, had sensitivities of 96.8, 83.0, and 86.7%, specificities of 90.1, 99.4, and 97.8%, and kappa values of 0.87, 0.85, and 0.83 with rMPB70. Examination of serial samples of sera collected from experimentally *M. bovis*-infected cattle and deer revealed that ESAT6-p-specific responses developed early after infection whereas responses to rMPB70 developed later in the course of disease. The advantage of the LBAA and ICGA as initial tests for multiple species is a rapid reaction obtained in 2 to 3 h by LBAA or 20 min by ICGA without species-specific secondary antibodies under field conditions, thus allowing immediate segregation of suspect animals for further testing before culling.

**Descriptors:** *Mycobacterium bovis*, infection detection, synthetic peptide derived from early secretory antigenic target 6 (ESAT6-p), recombinant major secreted immunogenic protein (rMPB70), ELISA, immunochromatographic assay (ICGA), latex bead agglutination assay (LBAA).

Kumar, Ashwani; Chandolia, Amita; Chaudhry, Uma; Brahmachari, Vani; Bose, Mridula. **Comparison of mammalian cell entry operons of mycobacteria: in silico analysis and expression profiling.** *FEMS Immunology and Medical Microbiology*. 2005; 43 (2): 185-195. ISSN: 0928-8244

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0928-8244&site=1>

**NAL Call Number:** QR180.F46

**Descriptors:** mycobacteria host cell entry, mammalian cell entry operons, pathogenic and saprophytic species, *Mycobacterium smegmatis*, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, silico analysis, Tt2B and Tt2C domains, differential expression under different culture conditions, mce1 operon, mce2 operon, mce3 operon, growth phase, redundancy in genome.

Lindstedt, Bjorn Arne. **Multiple-locus variable number tandem repeats analysis for genetic fingerprinting of pathogenic bacteria.** *Electrophoresis*. 2005; 26 (13): 2567-2582. ISSN: 0173-0835. Note: Literature review.

**URL:** <http://www3.interscience.wiley.com/journal/110515951/abstract?CRETRY=1&SRETRY=0>

**NAL Call Number:** QD79.E44E44

**Descriptors:** DNA fingerprinting, typing pathogenic bacteria, short sequence repeats, SSR, variable number of tandem repeats, VNTR, genetic polymorphisms, many bacterial families tested, *Bordetella pertussis*, *Bacillus anthracis*, *Salmonella typhimurium*, *Salmonella enterica*, *Yersinia pestis*, *Escherichia coli* strain-0157, *Enterococcus faecium*, *Leptospira interrogans*, *Staphylococcus aureus*, *Mycobacterium leprae*, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium avium paratuberculosis*, *Neisseria meningitidis*, *Haemophilus influenza*, *Pseudomonas aeruginosa*, *Borrelia burgdorferi*.

Liu Zhi hui; Cai Xing shan; Zhu Peng bo; Guan Ping; Xu Wan hua; Wu Long zhang. **Study on species identification of mycobacteria by gas chromatography analysis of whole-cell fatty acid.** *Zhonghua Jiehe He Huxi Zazhi*. 2005; 28 (6): 403-406. ISSN: 1001-0939. Note: In Chinese.

**Descriptors:** species identification, gas chromatography analysis, accuracy and applicability, *Mycobacterium bovis*, *Mycobacterium gastri*, *Mycobacterium triviale*, *Mycobacterium smegmatis*, *Mycobacterium*, *scrofulaceum*, *Mycobacterium gordnae*.

Mackowiak, Philip A.; Blos, Vera Tiesler; Aguilar, Manuel; Buikstra, Jane E. **On the origin of American tuberculosis.** *Clinical Infectious Diseases*. 2005; 41 (4): 515-518,507. ISSN: 1058-4838

**Descriptors:** humans, animals, tuberculosis in the US, pre-Columbian infection status, *Mycobacterium tuberculosis* or *Mycobacterium bovis*, history of the disease, USA.

Mishra, A.; Singhal, A.; Chauhan, D.S.; Katoch, V.M.; Srivastava, K.; Thakral, S.S.; Bharadwaj, S.S.; Sreenivas, V.; Prasad, H.K. **Direct detection and identification of *Mycobacterium tuberculosis* and *Mycobacterium bovis* in bovine samples by a novel nested PCR assay: correlation with conventional techniques.** *Journal of Clinical Microbiology*. 2005 Nov.; 43 (11): 5670-5678. ISSN: 0095-1137

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1489394>

**NAL Call Number:** QR46 J6

**Abstract:** *Mycobacterium tuberculosis* and *M. bovis* infect animals and humans. Their epidemiologies in developed and developing countries differ, owing to differences in the implementation of preventive measures (World Health Organization, 1999). Identification and differentiation of these closely related mycobacterial species would help to determine the source, reservoirs of infection, and disease burden due to diverse mycobacterial pathogens. The utility of the hupB gene (Rv2986c in *M. tuberculosis*, or Mb3010c in *M. bovis*) to differentiate *M. tuberculosis* and *M. bovis* was evaluated by a PCR-restriction fragment length polymorphism (RFLP) assay with 56 characterized bovine isolates (S. Prabhakar et al., *J. Clin. Microbiol.* 42:2724-2732, 2004). The degree of concordance between the PCR-RFLP assay and the microbiological characterization was 99.0% ( $P < 0.001$ ). A nested PCR (N-PCR) assay was developed, replacing the PCR-RFLP assay for direct detection of *M. tuberculosis* and *M. bovis* in bovine samples. The N-PCR products of *M. tuberculosis* and *M. bovis* corresponded to 116 and 89 bp, respectively. The detection limit of mycobacterial DNA by N-PCR was 50 fg, equivalent to five tubercle bacilli. *M. tuberculosis* and/or *M. bovis* was detected in 55.5% (105/189) of the samples by N-PCR, compared to 9.4% (18/189) by culture. The sensitivities of N-PCR and culture were 97.3 and 29.7, respectively, and their specificities were 22.2 and 77.7%, respectively. The percentages of animals or samples identified as infected with *M. tuberculosis* or *M. bovis* by N-PCR and culture reflected the clinical categorizations of the cattle ( $P$  of  $<0.05$  to  $<0.01$ ). Mixed infection by N-PCR was detected in 22 animals, whereas by culture mixed infection was detected in 1 animal.

**Descriptors:** *Mycobacterium tuberculosis*, *Mycobacterium bovis*, animals, humans, identification, differentiation, epidemiology, source, disease reservoirs, disease burden due to multiple infections, RFLP assay, 56 bovine isolates, nested PCR assay, 116 and 89 bp, sensitivities.

Monincova, M.; Jesenska, A.; Pavlova, M.; Strouhal, M.; Tisinska, I.; Chaloupkova, R.; Prokop, Z.; Bartos, M.; Pavlik, I.; Rychlik, I.; Mobius, P.; Nagata, Y.; Damborsky, J. **Mycobacterial haloalkane dehalogenases**. *FEBS Journal*. 2005; 272 (Suppl. 1): 514-515. ISSN: 1742-464X/1742-4658. Note: A poster at the 30th Congress of the Federation of European Biochemical Societies (FEBS)/9th IUBMB Conference, Budapest, Hungary; July 02 -07, 2005

**Descriptors:** *Mycobacterium* species, *Escherichia coli*, species, expression system, *Mycobacterium tuberculosis*, *Mycobacterium smegmatis* strain-MC2-155; *Mycobacterium avium* paratuberculosis strain-K10; *Mycobacterium bovis* strain-5032-66 dmbA-gene, haloalkane dehalogenase 95990-29-7, EC-3.8.1.5.

Mostowy, Serge; Inwald, Jackie; Gordon, Steve; Martin, Carlos; Warren, Rob; Kremer, Kristin; Cousins, Debby; Behr, Marcel A. **Revisiting the evolution of *Mycobacterium bovis***. *Journal of Bacteriology*. 2005; 187 (18): 6386-6395. ISSN: 0021-9193

**Descriptors:** *Mycobacterium bovis*, genomics, variability, strain differences, distinct distributions of disease, polymorphisms, broad host capacity, variety of mammals.

Murry, Jeffrey; Sasseti, Christopher M.; Moreira, Jonathan; Lane, James; Rubin, Eric J. **A new site-specific integration system for mycobacteria**. *Tuberculosis* (Amsterdam). 2005; 85 (5-6): 317-323. ISSN 1472-9792.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/638428/description?navopenmenu=-2](http://www.elsevier.com/wps/find/journaldescription.cws_home/638428/description?navopenmenu=-2)

**Descriptors:** *Streptomyces phi* C31 integration system; integrate vector DNA into *Mycobacterium smegmatis*, *Mycobacterium bovis* BCG, and *Mycobacterium tuberculosis*, site-specific recombination, stable transformants, useful in studying mycobacterial genetics.

Nascimento, Ivan P.; Leite, Luciana C.C. **The effect of passaging in liquid media and storage on *Mycobacterium bovis* - BCG growth capacity and infectivity**. *FEMS Microbiology Letters*. 2005; 243(1): 81-86. ISSN: 0378-1097

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/506058/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/506058/description#description)

**NAL Call Number:** QR1.F44

**Descriptors:** *Mycobacterium bovis* bacille Calmette-Guerin (BCG) Moreau strain; recombinant BCG (rBCG) vaccine preparation strain; effects of freezing, storage and thawing; three rounds of freezing and thawing limit ability for growth; culture density; macrophage infectivity tested, important factors, use fresh, low-passage and/or growth and infection capacity-controlled vaccine stocks.

Neill, S.D.; Skuce, R.A.; Pollock, J.M. **Tuberculosis - new light from an old window**. *Journal of Applied Microbiology*. 2005; 98 (6): 1261-1269. ISSN: 1364-5072

**URL:** <http://www.blackwell-synergy.com/loi/jam>

**NAL Call Number:** QR1.J687

**Descriptors:** bovine tuberculosis, zoonotic aspects, new information about *Mycobacterium bovis*, recent developments, pathogenesis, epidemiology, disease eradication, diagnosis, vaccination.

Newell, D.; Belcher, T. **Med Vet Net: integrating research on zoonoses**. *GVJ-Government Veterinary Journal*. 2005; 15 (2): 12-17. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** animal diseases, pathogens, zoonotic organisms, *Echinococcus*, *Escherichia coli*; *Mycobacterium bovis*, listerellosis, *Salmonella* infections, studies, trichinellosis, viral infections; zoonotic infections, UK.

Olin, Michael R.; Choi, K. Hwa; Lee, Jinhee; Molitor, Thomas W. **Gamma delta T-lymphocyte cytotoxic activity against *Mycobacterium bovis* analyzed by flow cytometry**. *Journal of Immunological Methods*. 2005; 297 (1-2): 1-11. ISSN: 0022-1759

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/506022/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/506022/description#description)

**Descriptors:** post animal vaccination, gamma delta T lymphocytes, response to *Mycobacterium bovis* BCG, proliferation of IFN gamma production, innate cytolytic functions, cytolytic assay, flow cytometry, K562 cells as targets, optimizing the assay, conclusion was that the assay is sensitive and reliable for cytolytic activity of gamma delta T lymphocytes.

Prasad, H.K.; Singhal, A.; Mishra, A.; Shah, N.P.; Katoch, V.M.; Thakral, S.S.; Singh, D.V.; Chumber, S.; Bal, S.; Aggarwal, S.; Padma, M.V.; Kumar, S.; Singh, M.K.; Acharya, S.K. **Bovine tuberculosis in India: Potential basis for zoonosis**. *Tuberculosis* (Amsterdam). 2005; 85(5-6): 421-428. ISSN: 1472-9792

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/638428/description?navopenmenu=-2](http://www.elsevier.com/wps/find/journaldescription.cws_home/638428/description?navopenmenu=-2)

**Descriptors:** tuberculosis, *Mycobacterium tuberculosis* infection, diagnosis, transmission, genetics, diagnosis, etiology, *Mycobacterium bovis*, nested PCR, genetic techniques, diagnostic assay techniques, clinical techniques, mixed infections, zoonotic diseases.

Perez, O.A. ***Mycobacterium avium* implicated in zoonoses**. *Revista de Medicina Veterinaria Buenos Aires*. 2005; 86 (6): 263-264. ISSN: 0325-6391. Note: In Spanish.

**Descriptors:** avian tuberculosis, *Mycobacterium avium*, *Mycobacterium avium* complex, taxonomy, subspecies, identification, seroagglutination testing, immunological methods, infection prevalence, Crohn's disease, paratuberculosis, review article,.

Price, S.J.; Hope, J.C.; Howard, C.J. **Bovine WC1+gamma delta T cells are synergistically stimulated by IL-12 and IL-18 to secrete high levels of IFN gamma**. *Immunology*. 2005; 116 (Suppl. 1): 77. ISSN: 0019-2805. Note: Abstract, Annual Congress of the British-Society-for-Immunology, Harrogate, England; December 06 -09, 2005

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0019-2805&site=1>

**NAL Call Number:** 448.3 IM6

**Descriptors:** cytokines, interferon-gamma, CD40, interleukin 18; interleukin-12, mycobacterial infections, synergistic stimulation, *Mycobacterium bovis*.

Rosenkrands, Ida; Agger, Else Marie; Olsen, Anja W.; Korsholm, Karen S.; Andersen, Claire Swetman; Jensen, Klaus T.; Andersen, Peter. **Cationic**

**liposomes containing mycobacterial lipids: a new powerful Th1 adjuvant system.** *Infection and Immunity*. 2005; 73 (9): 5817-5826. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The immunostimulation provided by the mycobacterial cell wall has been exploited for many decades, e.g., in Freund's complete adjuvant.

Recently, the underlying mechanism behind this adjuvant activity, including Toll receptor signaling, has begun to be unraveled, confirming the potential of mycobacterial constituents to act as adjuvants. In this study, the immunostimulatory properties of a *Mycobacterium bovis* BCG lipid extract were tested for their adjuvant activity. Administration of the lipids in dimethyl dioctadecyl ammonium bromide-based cationic liposomes induced a powerful Th1 response characterized by markedly elevated antigen-specific immunoglobulin G2a (IgG2a) isotype antibodies and substantial production of gamma interferon. The adjuvant formulation (designated mycosomes) elicited high levels of gamma interferon both in C57BL/6 as well as in Th2-prone BALB/c mice. Furthermore, the mycosomes induced immune responses to protein antigens from several sources including *Mycobacterium tuberculosis*, *Chlamydia muridarum*, and tetanus toxoid. In a tuberculosis challenge model, the mycosomes combined with the Ag85B-ESAT-6 fusion protein were demonstrated to have a unique ability to maintain sustained immunological memory at a level superior to live BCG.

**Descriptors:** adjuvant activity, mycobacterial cell wall, Freund's complete adjuvant, immunostimulatory properties, *Mycobacterium bovis* BCG lipid extract, Th2-prone Balb/c mice.

Skuce, R.A.; McDowell, S.W.; Mallon, T.R.; Luke, B.; Breadon, E.L.; Lagan, P.L.; McCormick, C.M.; McBride, S.H.; Pollock, J.M. **Discrimination of isolates of *Mycobacterium bovis* in Northern Ireland on the basis of variable numbers of tandem repeats (VNTRs).** *Veterinary Record*. 2005 Oct. 22; 157 (17): 501-504. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/>

**NAL Call Number:** 41.8 V641

**Descriptors:** *Mycobacterium bovis*, disease transmission, genetic techniques and protocols, Northern Ireland.

Wheeler, Paul R.; Coldham, Nicholas G.; Keating, Lisa; Gordon, Stephen V.; Wooff, Esen E.; Parish, Tanya; Hewinson, R. Glyn. **Functional demonstration of reverse transsulfuration in the *Mycobacterium tuberculosis* complex reveals that methionine is the preferred sulfur source for pathogenic mycobacteria.** *Journal of Biological Chemistry*. 2005; 280 (9): 8069-8078. ISSN: 0021-9258.

**URL:** <http://www.jbc.org/>

**Abstract:** Methionine can be used as the sole sulfur source by the *Mycobacterium tuberculosis* complex although it is not obvious from examination of the genome annotation how these bacteria utilize methionine. Given that genome annotation is a largely predictive process, key challenges are to validate these predictions and to fill in gaps for known functions for which genes have not been annotated. We have addressed these issues by functional analysis of methionine metabolism. Transport, followed by metabolism of S-35 methionine into the cysteine adduct mycothiol, demonstrated the conversion of exogenous methionine to cysteine. Mutational analysis and cloning of the Rv1079 gene showed it to encode the key enzyme required for this conversion, cystathionine gamma-lyase (CGL). Rv1079, annotated metB, was predicted to encode cystathionine gamma-synthase (CGS), but demonstration of a gamma-elimination reaction with cystathionine as well as the gamma-replacement reaction yielding cystathionine showed it encodes a bifunctional CGL/CGS enzyme. Consistent with this, a Rv1079 mutant could not incorporate sulfur from methionine into cysteine, while a cysA mutant lacking sulfate transport and a methionine auxotroph was hypersensitive to the CGL inhibitor propargylglycine. Thus, reverse transsulfuration alone, without any sulfur recycling reactions, allows *M. tuberculosis* to use methionine as the sole sulfur source. Intracellular cysteine was undetectable so only the CGL reaction occurs in intact mycobacteria. Cysteine desulfhydrase, an activity we showed to be separable from CGL/CGS, may have a role in removing excess cysteine and could explain the Ability of *M. tuberculosis* to recycle sulfur from cysteine, but not methionine.

**Descriptors:** *Escherichia coli* strain DH5 alpha, *Mycobacterium tuberculosis* strain H37Rv; *Mycobacterium bovis* strain-BCG-Pasteur, pathogenic strain metabolism, biochemistry of methionine as sulfur source.

Winters, A. Driver, C.; Macaraig, M.; Clark, C.; Munsiff, S.S.; Pichardo, C.; Driscoll, J.; Salfinger, M.; Kreiswirth, B.; Jereb, J.; LoBue, P.; Lynch, M. **Human tuberculosis caused by *Mycobacterium bovis* New York City, 2001-2004.** *Morbidity and Mortality Weekly Report*. 2005; 54 (24): 605-608. ISSN: 1057-5987

**Descriptors:** *Mycobacterium bovis*, zoonotic disease potential, epidemiology, infant contracted the disease, diagnostic techniques, genetic techniques, spoligotyping.

Yeruva, Veena C.; Sundaram, C.A.S. Sivagami; Sritharan, Manjula. **Effect of iron concentration on the expression and activity of catalase-peroxidases in mycobacteria.** *Indian Journal of Biochemistry and Biophysics*. 2005; 42 (1): 28-33. ISSN: 0301-1208

**Descriptors:** iron sufficient and deficient concentration in growth media, expression and activity of the different isoforms, *Mycobacterium bovis* BCG, *M. smegmati*, *M. fortuitum*, *M. kansasii*, *M. vaccae*, differences in catalase/peroxidase activity, susceptibility to heat inactivation, isoforms had variable heat responses.

Young, Jamie-S.; Gormley, Eamonn; Wellington, Elizabeth M. H. **Molecular detection of *Mycobacterium bovis* and *Mycobacterium bovis* BCG (Pasteur) in soil.** *Applied and Environmental Microbiology*. 2005; 71 (4): 1946-1952. ISSN: 0099-2240

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=83>

**NAL Call Number:** 448.3 Ap5

**Abstract:** PCR primers specific for the *Mycobacterium tuberculosis* complex were used to detect the presence of *Mycobacterium bovis* BCG (Pasteur) in soil microcosms and *Mycobacterium bovis* in environmental samples taken from a farm in Ireland with a history of bovine tuberculosis. *M. bovis* genes were detected in soil at 4 and 21 months after possible contamination. Gene levels were found in the range of  $1 \times 10^3$  to  $3.6 \times 10^3$  gene copies g of soil<sup>-1</sup>, depending on the sampling area. Areas around badger setts had the highest levels of detectable genes and were shown to have the highest levels of gene persistence. *M. bovis*-specific 16S rRNA sequences were detected, providing evidence of the presence of viable cells in Irish soils. Studies of DNA turnover in soil microcosms proved that dead cells of *M. bovis* BCG did not persist beyond 10 days. Further microcosm experiments revealed that *M. bovis* BCG survival was optimal at 37°C with moist soil (-20 kPa; 30% [vol/wt]). This study provides clear evidence

that *M. bovis* can persist in the farm environment outside of its hosts and that climatic factors influence survival rates.

**Descriptors:** *Mycobacterium bovis*, environmental sampling of soils, PCR primers, areas of badger setts had highest levels of gene persistence, 10 day persistence, optimal conditions, Ireland.

Young, Jamie S.; Gormley, Eamonn; Wellington, Elizabeth M.H. **Molecular detection of *Mycobacterium bovis* and *Mycobacterium bovis* BCG (Pasteur) in soil.** *Applied and Environmental Microbiology*. 2005; 71(4): 1946-1952. ISSN: 0099-2240

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=83>

**NAL Call Number:** 448.3 Ap5

**Descriptors:** PCR primers specific to *Mycobacterium tuberculosis* complex, *Mycobacterium bovis*, environmental samples, soil microcosms, farm land, around badger setts locations, 16SrRNA sequences, evidence of viable cells in soil, dead cells persisted for less than 10 days, optimal moist soil survival temperature was 37degrees C, Ireland.

Zanini, M.S.; Moreira, E.C.; Salas, C.E.; Lopes, M.T.P.; Barouni, A.S.; Roxo, E.; Telles, M.A.; Zumarraga, M.J. **Molecular typing of *Mycobacterium bovis* isolates from south-east Brazil by spoligotyping and RFLP.** *Journal of Veterinary Medicine Series B*. 2005 Apr; 52 (3) 129-133. ISSN: 0931-1793

**NAL Call Number:** 41.8 Z52

**Descriptors:** dairy cattle, beef cattle, bovine tuberculosis, *Mycobacterium bovis*, pathogen identification, microbial genetics, strains, genetic polymorphism, molecular genetics, antibiotic resistance, diagnostic techniques, spoligotyping, ethionamide rifampicin, isoniazid, strain differences, disease surveillance, diagnostic-techniques, post slaughter tissue collection, identification of 163 strains, polymerase chain reaction (PCR) and microbiological tests, 252 tuberculous-like lesions, 3 genotyping techniques, IS6110-restriction fragment length polymorphism (RFLP), polymorphic guanine-cytosine-rich sequence (PGRS)-RFLP and direct repeat (DR)-spoligotyping, fails to show a correlation between main cluster found by the 3 techniques, Brazil.

Zanini, M.S.; Moreira, E.C.; Salas, C.E.; Lopes, M.T.P.; Barouni, A.S.; Roxo, E.; Telles, M.A.; Zumarraga, M.J. **Molecular typing of *Mycobacterium bovis* isolates from south-east Brazil by spoligotyping and RFLP.** *Journal of Veterinary Medicine Series B*. 2005 Apr; 52 (3) 129-133. ISSN: 0931-1793

**NAL Call Number:** 41.8 Z52

**Descriptors:** dairy cattle, beef cattle, bovine tuberculosis, *Mycobacterium bovis*, pathogen identification, microbial genetics, strains, genetic polymorphism, molecular genetics, antibiotic resistance, diagnostic techniques, spoligotyping, ethionamide rifampicin, isoniazid, strain differences, disease surveillance, diagnostic-techniques, post slaughter tissue collection, identification of 163 strains, polymerase chain reaction (PCR) and microbiological tests, 252 tuberculous-like lesions, 3 genotyping techniques, IS6110-restriction fragment length polymorphism (RFLP), polymorphic guanine-cytosine-rich sequence (PGRS)-RFLP and direct repeat (DR)-spoligotyping, fails to show a correlation between main cluster found by the 3 techniques, Brazil.

Zumarraga, M.J.; Meikle, V.; Bernardelli, A.; Abdala, A.; Tarabla, H.; Romano, M.I.; Cataldi, A. **Use of touch-down polymerase chain reaction to enhance the sensitivity of *Mycobacterium bovis* detection.** *Journal of Veterinary Diagnostic Investigation*. 2005; 17 (3): 232-238. ISSN: 1040-6387

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** *Mycobacterium bovis*, PCR, detection, diagnosis, sensitivity of testing.

## 2004

Adcock, V.; Durr, P.A. **Use of scalable vector graphics for a web-delivered interactive digital atlas of bovine tuberculosis.** *GISVET' 04: Second International Conference on the Applications of GIS and Spatial Analysis to Veterinary Science, University of Guelph, Ontario, Canada, 23<sup>rd</sup> 25<sup>th</sup> June*. 2004; 22-25. ISBN: 189951323X. Note: Published by Veterinary Laboratories Agency. Addlestone, UK.

**Abstract:** Scalable vector graphics (SVG) is a new XML-based web technology combining high quality graphics, enhanced browser-based interactivity and rapid load times. This technology is useful for the production of interactive disease maps. The author describes its use for the successful implementation of an historical atlas of bovine tuberculosis in England and Wales, by permitting direct map production from the source data without requiring intermediate processing within a GIS.

**Descriptors:** *Mycobacterium tuberculosis*, computer programs, England.

Barouni, A.S.; Augusto, C.J.; Lopes, M.T.P.; Zanini, M.S.; Salas, C.E. **A *pncA* polymorphism to differentiate between *Mycobacterium bovis* and *Mycobacterium tuberculosis*.** *Molecular and Cellular Probes*. 2004; 18 (3): 167-170. ISSN: 0890-8508

**Descriptors:** pyrazinamidase gene coding, polymorphic site preserved in *Mycobacterium bovis*, synthesized primers, 180 pb fragment, 726 bp fragment with *pncA* gene, PCR, digestion with Eco065I, differential identification of unique fragments for each species.

Brandt, L.; Skeiky, Y.A.W.; Alderson, M.R.; Lobet, Y.; Dalemans, W.; Turner, O.C.; Basaraba, R.J.; Izzo, A.A.; Lasco, T.M.; Chapman, P.L.; Reed, S.G.; Orme, I.M. **The protective effect of the *Mycobacterium bovis* BCG vaccine is increased by coadministration with the *Mycobacterium tuberculosis* 72-kilodalton fusion polyprotein Mtb72F in *M. tuberculosis*-infected guineapigs.** *Infection and Immunity*. 2004; 72 (11): 6622-6632. ISSN: 0019-9567

**URL:** <http://iai.asm.org/cgi/content/Abstractstract/72/11/6622>

**NAL Call Number:** QR1.I57

**Abstract:** A tuberculosis vaccine candidate consisting of a 72-kDa polyprotein or fusion protein based upon the Mtb32 and Mtb39 antigens of *Mycobacterium tuberculosis* and designated Mtb72F was tested for its protective capacity as a potential adjunct to the *Mycobacterium bovis* BCG vaccine in the mouse and guineapig models of this disease. Formulation of recombinant Mtb72F (rMtb72F) in an AS02A adjuvant enhanced the Th1 response to BCG in mice but did not further reduce the bacterial load in the lungs after aerosol challenge infection. In the more stringent guineapig

disease model, rMtb72F delivered by coadministration with BCG vaccination significantly improved the survival of these animals compared to BCG alone, with some animals still alive and healthy in their appearance at >100 weeks post-aerosol challenge. A similar trend was observed with guinea pigs in which BCG vaccination was boosted by DNA vaccination, although this increase was not statistically significant due to excellent protection conferred by BCG alone. Histological examination of the lungs of test animals indicated that while BCG controls eventually died from overwhelming lung consolidation, the majority of guinea pigs receiving BCG mixed with rMtb72F or boosted twice with Mtb72F DNA had mostly clear lungs with minimal granulomatous lesions. Lesions were still prominent in guinea pigs receiving BCG and the Mtb72F DNA boost, but there was considerable evidence of lesion healing and airway remodeling and reestablishment. These data support the hypothesis that the coadministration or boosting of BCG vaccination with Mtb72F may limit the lung consolidation seen with BCG alone and may promote lesion resolution and healing. Collectively, these data suggest that enhancing BCG is a valid vaccination strategy for tuberculosis that is worthy of clinical evaluation.

**Descriptors:** guinea pigs, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, fusion proteins, antigens, bacterial proteins, candidate vaccines, DNA vaccines, immune response, immunity, immunization, lungs, niferitrol, tuberculosis, vaccination, vaccine development.

Broxmeyer, L. **Is mad cow disease caused by a bacteria?** *Medical Hypotheses*. 2004; 63(4): 731-739. ISSN: 0306-9877

**Descriptors:** TSE, BSE, CJD, scrapie, transmissible spongiform encephalopathies, prion, causes of disease, misfolded proteins, bacterial DNA, *Mycobacterium bovis*, isolation from clinical and histopathological signs of mad cow, UK areas of BSE where *M. Bovis* is highest, tuberculosis spongiform encephalitis, *Mycobacterium avium*, ssp *paratuberculosis* (fowl tuberculosis), mycobacteria hypothesis for mad cow disease.

Chambers, M.A.; Gavier-Widen, D.; Hewinson, R.G. **Antibody bound to the surface antigen MPB83 of *Mycobacterium bovis* enhances survival against high dose and low dose challenge.** *FEMS Immunology and Medical Microbiology*. 2004; 41 (2): 93-100. ISSN: 0928-8244

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0928-8244&site=1>

**NAL Call Number:** QR180.F46

**Abstract:** Tuberculosis caused by infection with *Mycobacterium tuberculosis* or *Mycobacterium bovis* is a significant disease of man and animals. Whilst cellular immunity is the major immunological component required for protection against these organisms, recent reports have suggested that monoclonal antibodies can modify infection with *M. tuberculosis*. To test whether the same was true for *M. bovis* infection, we determined the effect of preincubation of *M. bovis* with a monoclonal antibody on subsequent intravenous infection of mice. Antibodies bound to the surface of *M. bovis* increased the survival time of mice infected with *M. bovis* and changed the morphology of granulomas and the distribution of acid-fast bacilli in the lung. These studies suggest that antibodies directed to the surface of virulent mycobacteria can modulate their virulence in vivo.

**Descriptors:** *Mycobacterium bovis*, animal pathogenic bacteria, infection, virulence, monoclonal antibodies, surface antigens, mice.

Coffey, Michael Joseph; Phare, Susan M.; Peters-Golden, Marc. **Role of leukotrienes in killing of *Mycobacterium bovis* by neutrophils.** *Prostaglandins Leukotrienes and Essential Fatty Acids*. 2004; 71 (3): 185-190. ISSN: 0952-3278

**Descriptors:** *Mycobacterium bovis*, host defense, phagocytosis and killing processes, leukotrienes (LT), role in killing, LT synthesis inhibitor MK 886 affected ability of neutrophils to kill *Mycobacterium bovis*, LT increased when neutrophils were incubated with *Mycobacterium bovis*.

Collins, D.M.C.; For, R.; Skou, B.; Collins, L.; Bassett, S.; de Lisle, G.W. **Signature tag mutagenesis with *Mycobacterium bovis*.** *Abstracts of the General Meeting of the American Society for Microbiology*. 2004; 104: 628. ISSN: 1060-2011. Note: 104th General Meeting of the American Society for Microbiology, New Orleans, LA, USA; May 23-27, 2004.

**NAL Call Number:** QR1.A5

**Descriptors:** guinea pigs, *Mycobacterium bovis*, mutagenesis.

Denis, Michel; Wedlock, D. Neil; Buddle, Bryce M. **Ability of T cell subsets and their soluble mediators to modulate the replication of *Mycobacterium bovis* in bovine macrophages.** *Cellular Immunology*. 2004; 232 (1-2): 1-8. ISSN: 0008-8749

**Descriptors:** vaccinated cattle, peripheral blood mononuclear cells (PBMCs), *Mycobacterium bovis* BCG, *Mycobacterium bovis* virulent strain, modulation of replication between exposure of cells from vaccinated to virulent pathogen, compared to controls, neutralizing antibody IFN-gamma, addition of T-cells, neutralizing of nitric oxide by inclusion of monomethyl-L arginine, immune resistance.

Dhama, K.; Bansal, M.P.; Rathore, R.; Ram, G.C. **Evaluation of the role of Con-A and PHA-P induced leucocyte conditioned medium in activating bovine blood monocytes pulsed with *Mycobacterium bovis* BCG.** *Journal of Immunology and Immunopathology*. 2004; 6 (2): 24-27. ISSN: 0972-0561.

**Descriptors:** calves, tuberculosis free, intramuscular inoculation, pure culture of *Mycobacterium bovis*, sensitization by DTH skin testing, ELISA, LTT using PPD as antigen, blood monocytes, in vitro stimulated, role of concanavalin A (Con-A) and phytohaemagglutinin (PHA-P) induced leucocyte conditioned medium, cell behaviors, phagocytosis, immune phagocytosis, antibody dependent cellular cytotoxicity, nitrite production, intracellular killing of *M. bovis* BCG.

Diguimbaye, C.; Schelling, E.; Pfyffer, G.E.; Baggi, F.; Ngandolo, R.; Ndoutamia, G.; Tanner, M.; Zinsstag, J. **Premiers isolements de mycobactéries tuberculeuses chez l'homme et l'animal au Tchad. [First isolation of tuberculous mycobacteria in man and animals in Chad.]** *Medecine Tropicale*. 2004; 64 (5): 482-485. ISSN: 0025-682X. Note: In French with an English summary.

**Descriptors:** first isolation and identification of *Mycobacterium bovis*, *Mycobacterium tuberculosis*, antibiotic resistance, pyrazinamide, control policies needed, Chad.

Fritsche, A.; Engel, R.; Buhl, D.; Zellweger, J.P. ***Mycobacterium bovis* tuberculosis: from animal to man and back.** *International Journal of Tuberculosis and Lung Disease*. 2004; 8 (7): 903-904. ISSN: 1027-3719. Note: In English with French and Spanish summaries.

**Descriptors:** humans, cattle, other infected animals, *Mycobacterium bovis*, strains, zoonotic disease, disease transmission from animal to human and back to animal, case reports, clinical aspects, disease course, disease transmission, exposure, human diseases, strains, tuberculosis, Switzerland.

Haddad, Nadia; Masselot, Monique; Durand, B. **Molecular differentiation of *Mycobacterium bovis* isolates. Review of main techniques and applications.** *Research in Veterinary Science*. 2004; 76 (1): 1-18. ISSN: 0034-5288

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Descriptors:** *Mycobacterium bovis*, typing techniques, genetic species *Mycobacterium tuberculosis* complex, genome studies, IS6110 insertion sequence markers, direct repeat region, poly (GC)rich sequences, variable number tandem repeats sequences, description of techniques, examples of typing application reviewed, epidemiology problems.

Hammer, P. **Heat inactivation of classical mycobacteria in milk - a historical review.** *Bulletin of the International Dairy Federation.* 2004; (392): 42-48. ISSN: 0250-5118. Note: International workshop on "Revisiting Heat Resistance of Microorganisms in Milk, Kiel, Germany, 5-8 May 2003."

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, bacterial inactivation in milk, high temperature short time pasteurization, research variables in articles, food contamination, food safety, bacterial heat tolerance, historical literature review.

Hope, J.C.; Thom, M.L.; McCormick, P.A.; Howard, C.J. **Interaction of antigen presenting cells with mycobacteria.** *Veterinary Immunology and Immunopathology.* 2004; 100 (3/4): 187-195. ISSN: 0165-2427. Note: Host Pathogen Interactions. Plenary Papers Presented at the CVIG Session of the AVTRW Annual Conference, Scarborough, UK, 16 April 2003.

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain, bovine antigen presenting cells, dendritic cell infection with mycobacteria, cell-based immunity, antigens, innate and adaptive immune responses induced, cytokines, immune response, interleukins, macrophage activation, major histocompatibility complex, strain, T-lymphocytes, tumour necrosis factor.

Jacobs, William R. Jr; Bloom, Barry; Kalpana, Ganjam V.; Cirillo, Jeffrey D.; McAdam, Ruth. **Insertional mutations in mycobacteria.** *Official Gazette of the United States Patent and Trademark Office Patents.* 2004; 1283 (4). ISSN: 0098-1133

**URL:** <http://www.uspto.gov/web/menu/patdata.html>

**Abstract:** A mutated mycobacterium selected from the class consisting of mutated *M. bovis* BCG, mutated *M. tuberculosis*, and mutated *M. leprae*. The mutation of *M. bovis* BCG, *M. tuberculosis*, or *M. leprae* is preferably effected through an insertional mutation of a mycobacterial gene. The insertional mutagenesis may be effected, for example, through illegitimate recombination or by a mycobacterial transposon. Such mutated mycobacteria may then be transformed with an expression vector(s) containing a complement gene to the gene which is mutated, and preferably also including a heterologous gene.

**Descriptors:** mycobacteria, *Mycobacterium bovis* BCG, *Mycobacterium tuberculosis*, *Mycobacterium leprae*, insertional mutations.

Jiang, XiuYun; Wang, ChunFeng; Wang, ChunFang; He, ZhaoYang. **Cloning and sequence analysis of *Mycobacterium bovis* Ag85A gene.** *Chinese Journal of Veterinary Science and Technology.* 2004; 34 (9): 21-24. ISSN: 1000-6419. Note: In Chinese with an English summary.

**Descriptors:** *Mycobacterium bovis* strain Vallee111, DNA extraction, secreted Ag85A gene, amplified using PCR, clone vector pGEM-T, 85A, cloned into pGEM-T vector using T-A clone technique, immunogenicity, gene expression, DNA sequencing.

Koo, Hye Cheong; Park, Yong Ho; Ahn, Jongsam; Waters, W. Ray; Hamilton, Mary Jo; Barrington, George; Mosaad, Abdelaziz A.; Palmer, Mitch V.; Shin, Sang; Davis, William C. **New latex bead agglutination assay for differential diagnosis of cattle infected with *Mycobacterium bovis* and *Mycobacterium avium* subsp. *paratuberculosis*.** *Clinical and Diagnostic Laboratory Immunology.* 2004; 11 (6): 1070-1074. ISSN: 1071-412X

**Descriptors:** cattle, identification of animals infected with *Mycobacterium bovis*, *Mycobacterium avium* subsp. *paratuberculosis*, current assays not sensitive and specific to identify diseased animals, latex bead agglutination assay (LBAA) using specific immunodominant epitope (ESAT6-p) of *M. bovis*, compared assay to culture method and skin test, experimental infection and non-infected animals, species specific diagnosis, sera testing, data suggest a rapid, sensitive and specific assay can be developed.

Kurabachew, Mekonnen; Enger, Oivind; Sandaa, Ruth Anne; Skuce, Robin; Bjorvatn, Bjarne. **A multiplex polymerase chain reaction assay for genus-, group- and species- specific detection of mycobacteria.** *Diagnostic Microbiology and Infectious Disease.* 2004; 49(2): 99-104. ISSN: 0732-8893

**Descriptors:** multiplex PCR assay, single step, differential between species, *Mycobacterium tuberculosis* complex and other non TB *Mycobacterium* species using 16S and 23S rDNA, and, *Mycobacterium tuberculosis* and *Mycobacterium bovis* species using *oxyI*? gene, 156 clinical samples and reference stains used, *Mycobacterium africanum*, *oxyRTB2.1* *loxyRMB-1* primers, 1pg of purified genomic DNA for identification.

Kutalik, Zoltan; Razaz, Moe; Inwald, Jackie; Gordon, Steve V.; Wolkenhauer, Olaf. **A novel statistical approach in comparative genomics to reveal new immunogenic antigens in *M. bovis*.** *Tissue Antigens.* 2004; 64 (4): 427. ISSN: 0001-2815. Note: Meeting abstract. 1st International Conference on Basic and Clinical Immunogenomics, Budapest, Hungary; October 03-07, 2004.

**Descriptors:** *Mycobacterium bovis*, comparative genomics, cattle pathogen, molecular genetics methods and techniques, immunology, immunogenic antigens, immunostimulant drug, tuberculin PPD, diagnostic antigen, Bayesian analysis, PCR, spoligotype-specific-deletion.

Kutalik, Zoltan; Inwald, Jacqueline; Gordon, Steve V.; Hewinson, R. Glyn; Butcher, Philip; Hinds, Jason; Cho, Kwang Hyun; Wolkenhauer, Olaf. **Advanced significance analysis of microarray data based on weighted resampling: a comparative study and application to gene deletions in *Mycobacterium bovis*.** *Bioinformatics* (Oxford). 2004; 20(3): 357-363. ISSN: 1367-4803

**Descriptors:** methods, analyzing microarray data, differences in gene expression levels, normalized channel intensity levels, different experimental conditions, SAM, regularized t-test, mixture modeling, Wilk's lambda score, variance stabilization, weighted resampling approach, gene deletions, *Mycobacterium bovis*, assumptions, model structure, computation, applicability.

Larson, Jean A, Animal Welfare Information Center (U.S.). **Tuberculosis in animals : *Mycobacterium* bacilli that cause devastating zoonotic diseases in many animals.** *AWIC Resource Series; no. 2004-01.* U.S. Dept. of Agriculture, Agricultural Research Service, National Agricultural Library, Animal Welfare Information Center. Beltsville, MD [2004]

**URL:** <http://www.nal.usda.gov/awic/pubs/TB/TBMain.htm>

**NAL Call Number:** aHV4701.A94 no. 2004-01

**Abstract:** The focus of this publication is on information related to tubercular diseases of animals caused by the bacterial genus *Mycobacterium*.

Livestock diseases are mostly caused by *Mycobacterium bovis* and the *Mycobacterium tuberculosis* complex. Many species of animals are included: large ruminants, wildlife, wild animals as disease reservoirs, deer, elephants, birds, fish, etc. Topics are varied and include clinical aspects of the disease, the disease process, disease prevention and control, vaccines, immunology, bacterial genetics, zoonotic aspects, etc.

**Descriptors:** tuberculosis in animals, bibliography, *Mycobacterium* sp, *Mycobacterium avium*, *Mycobacterium bovis*, zoonoses, production animals, zoo animals, wild animals, disease control, *Mycobacterium tuberculosis* complex, microbial genetics, disease incidence worldwide, control programs worldwide, immune response, wild animal vectors, treatments, animal disease models, aquatic animals, diagnostic methods, disease pathology, disease incidence worldwide.

Lucca, E.; Canal, A.M.; Pachoud, J.C.; Gollan, A.; Bergamasco, M.; Latini, M.; Lopez, M.; Nicola, A.; Tomatis, I.; Scarpin, V. **Diagnostico de tuberculosis bovina: correlacion entre pruebas diagnosticas. [Diagnosis of bovine tuberculosis: correlation between different diagnostic tests.]** *Veterinaria Argentina*. 2004; 21 (203): 196-203. ISSN: 0326-4629. Note: In Spanish with an English summary.

**Descriptors:** dairy cattle; *Mycobacterium bovis*; blood sampling, diagnostic tests; correlation between tuberculin skin test, bacteriological cultures, microscopic lesions of lymph nodes and other organs, and interferon-gamma assay; interferon-gamma assay not sufficient at detecting *M. bovis*, Argentina.

Manuel-Tibata, Victor; Eugenia-Gonzalez, Clara; German-Rodriguez, Juan; del Portillo, Patricia. **[Transcriptional analysis of genetic region RvD1 of *Mycobacterium bovis*.]** *Revista Colombiana de Biotecnologia*. 2004; 6(2): 62-66. ISSN: 0123-3475. Note: In Spanish.

**Descriptors:** *Mycobacterium bovis*, 99.9% of genomic identity with *M. tuberculosis*, *M. africanum*, *M. microti*, 2 genetic regions deleted in *M. tuberculosis*--H37Rv: RvD1, RvD2, RNA from *M. bovis* BCG, Rtg-PCR, ORF1, ORF2 and Rv2024, were transcribed constitutively, RvD1 possible role in pathogenesis, interaction with both cattle and humans.

Milian-Suazo, F.; Serna-Gonzalez, C.O.; Banda-Ruiz, V.; Robles P., G.; Arriaga-Diaz, C.; Anaya-Escalera, A.M. **Genetic stability of a *Mycobacterium bovis* strain by serial infections in guinea pigs.** *Tecnica Pecuaria en Mexico*. 2004; 42 (3): 315-323. ISSN: 0040-1889. Note: In Spanish and English.

**Descriptors:** guinea pigs, *Mycobacterium bovis*, cattle isolated strain, disease model, "direct repeat" region variability, serial passage, intraperitoneal inoculation, 103 pathogens/animal, non-lethal mutation developed during bacterial reproduction.

Pate, Mateja; Zdovc, Irena; Pirs, Tina; Krt, B.; Ocepek, M. **Isolation and characterisation of *Mycobacterium avium* and *Rhodococcus equi* from granulomatous lesions of swine lymph nodes in Slovenia.** *Acta Veterinaria Hungarica*. 2004; 52 (2): 143-150. ISSN: 0236-6290

**Descriptors:** cattle; swine; lymph nodes; mixed infections; *Mycobacterium hominissuis* (IS901-, IS1245+ genotype); *Mycobacterium avium avium* (IS901+, IS1245+ genotype); typed using IS1245, IS901 and FR300 PCR; *Rhodococcus equi* isolates; tested for virulence-associated antigens (VapA and VapB).

Roring, Solvig; Scott, Alistair N.; Hewinson, R. Glyn; Neill, Sydney D.; Skuce, Robin A. **Evaluation of variable number tandem repeat (VNTR) loci in molecular typing of *Mycobacterium bovis* isolates from Ireland.** *Veterinary Microbiology*. 2004; 101 (1): 65-73. ISSN: 0378-1135

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** strain typing, *Mycobacterium tuberculosis* complex, *Mycobacterium bovis*, exact tandem repeats (ETRs), mycobacterial interspersed repetitive units (MIRUs), variable number tandem repeat (VNTR) loci, spoligotyping using 47 field isolates, suggest a panel of VNTI markers for molecular epidemiological studies.

Shah, D.H.; Singh, S.K.; Rishendra Verma. ***Mycobacterium bovis*-specific 500 bp DNA fragment is also present in the genome of *Mycobacterium tuberculosis*: a growing evidence.** In: C.T.N.F. Iskandar; L. Hassan; G.K. Dhaliwal; R. Yusoff; A.R. Omar; M.A.K.G. Khan; (et-al). *Animal Health: A Breakpoint in Economic Development? The 11<sup>th</sup> International Conference of the Association of Institutions for Tropical Veterinary Medicine and 16<sup>th</sup> Veterinary Association Malaysia Congress, 23-27 August 2004, Petaling Jaya, Malaysia*. 2004; 224-225. ISBN: 9832871662

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, multiplex-PCR assay, 500bp DNA fragment, 185 bp PNCA product, human sputum samples.

Singh, Jitendra; Joshi, Mohan Chandra; Bhatnagar, Rakesh. **Cloning and expression of mycobacterial glutamine synthetase gene in *Escherichia coli*.** *Biochemical and Biophysical Research Communications*. 2004; 317(2): 634-638. ISSN: 0006-291X

**Descriptors:** extracellular glutamine synthetase (GS) gene, prominent proteins secreted by pathogenic mycobacteria, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, non-pathogenic *Mycobacterium smegmatis* and *Mycobacterium phlei* do not secrete this protein, structure gene amplified, fusion protein with hexahistidine residues in *E. coli*, solubilized inclusion bodies, purified process for recombinant glutamine synthetase, first report of cloning and expression of mycobacterial GS in *E. coli*.

Singh, S.K.; Rishendra Verma; Shah, D.H. **Molecular fingerprinting of clinical isolates of *Mycobacterium bovis* and *Mycobacterium tuberculosis* from India by restriction fragment length polymorphism (RFLP).** *Journal of Veterinary Science*. 2004; 5 (4): 331-335. ISSN: 1229-845X

**URL:** <http://www.vetsci.org/2004/pdf/331.pdf>

**Abstract:** Forty mycobacterial strains comprising clinical Indian isolates of *Mycobacterium tuberculosis* (28 field isolates +1H37 Rv) and *Mycobacterium bovis* (10 field isolates +1 AN5) were subjected to restriction fragment length polymorphism analysis (RFLP) using IS6110 and IS1081 probes. Most of these strains originated from dairy cattle herd and human patients from Indian Veterinary research Institute (IVRI) campus isolated from the period of 1986 to 2000. Our study showed presence of 8 copies of IS6110 in most of the *M.tuberculosis* (96.6%) strains irrespective of their origin with the exception of one *M.tuberculosis* strain with presence of an extra copy (3.4%). All *M.bovis* strains showed a single copy of IS6110 on the characteristic 1.9 kb restriction fragment. RFLP analysis with IS1081 invariably showed the presence of 5 copies in all isolates of *M.bovis* and *M.tuberculosis* at the same chromosomal location. Similarity of IS6110 RFLP fingerprints of *M.tuberculosis* strains from animals and

human suggested the possibility of dissemination of single *M.tuberculosis* strain among animals as well as human. It was not possible to discriminate within the isolates of either *M.tuberculosis* or *M.bovis*, when IS1081 was used as target sequence. The IS6110 RFLP is a valuable tool for disclosing transmission chain of *M. tuberculosis* and *M. bovis* among humans as well as animals.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, disease transmission between species, 40 mycobacterial strains, clinical and field isolates, RFLP, IS6110 and IS1081 probes, dairy cattle herds, patients, Indian Veterinary Research Institute campus, strains and species compared, India.

Stermann, M.; Sedlacek, L.; Maass, S.; Bange, F.C. **A promoter mutation causes differential nitrate reductase activity of *Mycobacterium tuberculosis* and *Mycobacterium bovis*.** *Journal of Bacteriology*. 2004; 186 (9): 2856-2861. ISSN: 0021-9193

**URL:** <http://jb.asm.org/cgi/content/Abstracttract/186/9/2856>

**Abstract:** The recent publication of the genome sequence of *Mycobacterium bovis* showed >99.95% identity to *M. tuberculosis*. No genes unique to *M. bovis* were found. Instead numerous single-nucleotide polymorphisms (SNPs) were identified. This has led to the hypothesis that differential gene expression due to SNPs might explain the differences between the human and bovine tubercle bacilli. One phenotypic distinction between *M. tuberculosis* and *M. bovis* is nitrate reduction, which not only is an essential diagnostic tool but also contributes to mycobacterial pathogenesis. We previously showed that narGHJI encodes a nitrate reductase in both *M. tuberculosis* and *M. bovis* and that NarGHJI-mediated nitrate reductase activity was substantially higher in the human tubercle bacillus. In the present study we used a genetic approach to demonstrate that an SNP within the promoter of the nitrate reductase gene cluster narGHJI is responsible for the different nitrate reductase activity of *M. tuberculosis* and *M. bovis*.

This is the first example of an SNP that leads to differential gene expression between the human and bovine tubercle bacilli..

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, pathogenesis, chromosomes, cosmids, cytosine, enzyme activity, gene expression, genes, genome analysis, genomes, mutations, nitrite, promoters, thymine, no genes unique to *Mycobacterium bovis* found, single nucleotide polymorphisms identified, differential gene expression hypothesis, SNP in nitrate reductase gene cluster nar GHJI different nitrate reductase between 2 pathogens.

Vesosky, B.; Turner, O.C.; Turner, J.; Orme, I.M. **Gamma interferon production by bovine gammadelta T cells following stimulation with mycobacterial mycolylarabinogalactan peptidoglycan.** *Infection and Immunity*. 2004; 72 (8): 4612-4618. ISSN: 0019-9567

**URL:** <http://iai.asm.org>

**NAL Call Number:** QR1.I57

**Abstract:** A large percentage of lymphocytes in the blood of cattle express the gammadelta T-cell receptor, but specific functions for these cells have not yet been clearly defined. There is evidence, however, that human, murine, and bovine gammadelta T-cells have a role in the immune response to mycobacteria. This study investigated the ability of bovine gammadelta T-cells to expand and produce gamma interferon (IFN-gamma) in response to stimulation with mycobacterial products. Bovine gammadelta T-cells, isolated from the peripheral blood of healthy cattle, expanded following in vitro stimulation with live mycobacteria, mycobacterial crude cell wall extract, and *Mycobacterium bovis* culture filtrate proteins. In addition, purified gammadelta T-cells, co-cultured with purified monocytes and interleukin-2, consistently produced significant amounts of IFN-gamma in response to mycobacterial cell wall. The IFN-gamma-inducing component of the cell wall was further identified as a proteolytically resistant, non-sodium dodecyl sulfate-soluble component of the mycolylarabinogalactan peptidoglycan.

**Descriptors:** cattle, gamma interferon production, bovine gammadelta T-cells, lymphocytes, ability to expand and produce IFN-gamma, stimulation, live mycobacteria, mycobacterial crude cell wall extract, *Mycobacterium bovis* culture filtrate, cell biochemistry.

Zink, A.R.; Nerlich, A.G. **Molecular strain identification of the *Mycobacterium tuberculosis* complex in archival tissue samples.** *Journal of Clinical Pathology* (London). 2004; 57 (11): 1185-1192. ISSN: 0021-9746

**URL:** <http://jcp.bmj.com/cgi/content/full/57/11/1185>

**Descriptors:** identify human pathogenic mycobacteria, 49 archival tissue sources, formalin fixed or paraffin wax embedded material, *Mycobacterium tuberculosis* complex, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium africanum*, *Mycobacterium microti*, or *Mycobacterium canettii*, and/or substrains, identifying individual infection traits and superinfection by different strains, DNA analysis, IS6110 positive characterized by spoligotyping.

Zubrzycki, Igor Z. **Analysis of the products of genes encompassed by the theoretically predicted pathogenicity islands of *Mycobacterium tuberculosis* and *Mycobacterium bovis*.** *Proteins Structure Function and Bioinformatics*. 2004; 54 (3): 563-568.

**URL:** <http://www3.interscience.wiley.com/cgi-bin/fulltext/106567464/PDFSTART>

**Descriptors:** *Mycobacterium tuberculosis*, *Mycobacterium bovis*, sequencing genomes, biology of pathogens, computational detection, anomalous gene clusters, cross genomic comparisons, identified unique proteins of *Mycobacterium tuberculosis*.

## 2003

Aranaz, Alicia; Cousins, Debby; Mateos, Ana; Dominguez,-Lucas. **Elevation of *Mycobacterium tuberculosis* subsp. *caprae* Aranaz et al. 1999 to species rank as *Mycobacterium caprae* comb. nov., sp. nov.** *International Journal of Systematic and Evolutionary Microbiology*. 2003; 53(6): 1785-1789. ISSN: 1466-5026

**URL:** <http://ijs.sgmjournals.org/cgi/content/full/53/6/1785>

maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&author1=aranaz&searchid=1&FIRSTINDEX=0&sortspec=relevance&resourcetype=HWCIT

**NAL Call Number:** QR1.I577

**Descriptors:** *Mycobacterium tuberculosis* complex, Spanish goat isolates, *Mycobacterium tuberculosis* ssp. *caprae*, reclassification to *Mycobacterium caprae* comb. nov., sp. nov, biochemical and epidemiological parameters, combination of pncA, oxyR, katG and gyrA gene polymorphisms, special nucleotide substitutions, isolated from other animals, cattle, wild boar, pigs, genetic studies show older than *Mycobacterium bovis*, France, Austria, Germany.

Buddle, B.M.; McCarthy, A.R.; Ryan, T.J.; Pollock, J.M.; Vordermeier, H.M.; Hewinson, R.G.; Andersen, P.; De Lisle, G.W. **Use of mycobacterial**

**peptides and recombinant proteins for the diagnosis of bovine tuberculosis in skin test-positive cattle.** *Veterinary Record*. 2003; 153 (20): 615-620. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/>

**NAL Call Number:** 41.8 V641

**Descriptors:** bovine tuberculosis, cattle, synthetic peptides, antigen detection, skin lesions, skin tests, paratuberculosis, diagnostic techniques, cross reaction, tuberculin, recombinant proteins, disease diagnosis, *Mycobacterium bovis*, interferons, skin folds, vaccination, *Mycobacterium avium* ssp. *paratuberculosis*, animal pathogenic bacteria.

Collins, Desmond M.; Kawakami, R Pamela; Buddle, Bryce M.; Wards, Barry J.; De Lisle, Geoffrey W. **Different susceptibility of two animal species infected with isogenic mutants of *Mycobacterium bovis* identifies *phoT* as having roles in tuberculosis virulence and phosphate transport.** *Microbiology* (Reading). 2003; 149 (11): 3203-3212. ISSN: 1350-0872

**URL:** <http://mic.sgmjournals.org/contents-by-date.0.shtml>

**NAL Call Number:** QR1.J65

**Descriptors:** *Mycobacterium tuberculosis* complex, *Mycobacterium bovis*, ATCC35721, mutation, principal sigma factor gene, *sigA*, accessory transcription factor *WhiB3*, *M. bovis*, Wag320, guinea pigs, brushtail possum (*Tricurosurus vulpecula*), virulence restoring factor, *phoT*, role in phosphate uptake at low phosphate concentrations, 2 point deletions, use of different animal species.

Haddad, N.; Masselot, M.; Durand, B. **Molecular differentiation of *Mycobacterium bovis* isolates. Review of main techniques and applications.** *Research in Veterinary Science*. 2004; 76 (1): 1-18. ISSN: 0034-5288

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Descriptors:** *Mycobacterium bovis*, animal pathogenic bacteria strains, strain differences, phylogeny, molecular genetics, transposons, repetitive sequences, tandem repeat sequences, nucleotide sequences, literature reviews, genetic polymorphism, epidemiology, population genetics, genetic markers, pathogen identification, molecular markers.

Kurabachew, M.; Enger, O.; Sandaa, R.A.; Eshetu-Lemma; Bjorvatn, B. **Amplified ribosomal DNA restriction analysis in the differentiation of related species of mycobacteria.** *Journal of Microbiological Methods*. 2003; 55 (1): 83-90. ISSN: 0167-7012

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain, *Mycobacterium tuberculosis*, *Mycobacterium africanum*, intra and inter species identification, amplified ribosomal DNA restriction analysis, 16S and 23S rDNA, 16S-23SrDNA spacer, 121 isolates, 13 different mycobacterial species, restriction digestion, restriction enzymes, *CfoI*, *HaeIII*, *RsaI*, *MspI*, *TaqI*, method to recognize strains of *M. tuberculosis* complex and others.

Lewin, A.; Freytag, B.; Meister, B.; Sharbati Tehrani, S.; Schaefer, H.; Appel, B. **Use of a quantitative TaqMan-PCR for the fast quantification of mycobacteria in broth culture, eukaryotic cell culture and tissue.** *Journal of Veterinary Medicine Series B*. 2003; 50 (10): 505-509. ISSN: 0931-1793

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=1863-1959&site=1>

**Descriptors:** *Mycobacterium tuberculosis*, *Mycobacterium bovis* BCG, quantification, in vitro samples, in vivo samples, growth curves, broth cultures, quantitative TaqMan PCR, multiplication within eukaryotic cells, load in tissue before colony counts.

Lis, Henryk. **Występowanie i zwalczanie gruźlicy bydła w niektórych państwach Unii Europejskiej i w Polsce. [Incidence and eradication of bovine tuberculosis in some EU countries and in Poland.]** *Medycyna Weterynaryjna*. 2003; 59 (11): 1040-1042. ISSN: 0025-8628. Note: In Polish.

**Descriptors:** *Mycobacterium bovis*, animal pathogen, farm animals, disease distribution, outbreaks can still occur in Poland, present in other EU countries, France, Greece, Ireland, Italy, Portugal, Spain.

Marano, Nina; Pappaioanou, Marguerite. **Historical, new, and reemerging links between human and animal health.** *Emerging Infectious Diseases*. 2004; 10 (12): 2065-2066. ISSN: 1080-6040

**URL:** <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?linkbar=plain&db=journals&term=1080-6040>

**NAL Call Number:** RA648.5.E46

**Descriptors:** human and animal disease interactions, zoonotic disease, transmission of disease between species, historical information, Hantavirus, *Salmonella Newport*, West Nile virus, *Mybacterium bovis*-tuberculosis, Nipah virus, infectious diseases, epidemiology, prevention and control, global trade, human behaviors, international travel of humans and animals, rapid microbial adaptation, wildlife reservoirs.

Maslow, Joel N.; Irani, Vida R.; Lee, Sun Hwa; Eckstein, Torsten M.; Inamine, Julia M.; Belisle, John T. **Biosynthetic specificity of the rhamnosyltransferase gene of *Mycobacterium avium* serovar 2 as determined by allelic exchange mutagenesis.** *Microbiology* (Reading). 2003; 149 (11): 3193-3202. ISSN: 1350-0872

**URL:** <http://mic.sgmjournals.org/contents-by-date.0.shtml>

**NAL Call Number:** QR1.J65

**Descriptors:** *Mycobacterium bovis* serovar strain 2 TMC724 derived via a plasmid, *Mycobacterium smegmatis*, rhamnosyltransferase, *rtfA* gene, catalyses addition of rhamnose to 6-deoxytalose of serover 2-specific glycopeptidolipid, alaninol, lipipeptide, system of allelic exchange for *M. avium* as a tool for future genetic studies.

Quesniaux, V.; Fremond, C.; Jacobs, M.; Shreemanta Parida; Nicolle, D.; Yermeev, V.; Bihl, F.; Erard, F.; Botha, T.; Drennan, M.; Soler, M.N.; Bert, M. le; Schnyder, B.; Ryffel, B. **Toll-like receptor pathways in the immune responses to mycobacteria.** *Microbes and Infection*. 2004; 6 (10): 946-959.

**Descriptors:** mice, laboratory animals, disease model, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium chelonae*, *Mycobacterium kansasii*, *Mycobacterium smegmatis*, *Mycobacterium tuberculosis*, bacterial antigens, bacterial proteins, biochemical receptors, cell cultures, disease models, experimental infections, immune response, in vitro, ligands, mycobacterial diseases, literature reviews tuberculosis toll-like receptors.

Ramarokoto, H.; Andrianasolo, D.; Rasolonalavona, T.; Ramaroson, F.; Razafitsiarovana, I.; Vincent, V.; Ratsimba, L.; Rasolofo Razanamparany, V. **Un cas de tuberculose pulmonaire a *Mycobacterium bovis* multiresistant a Madagascar. [A case of pulmonary multi-resistant tuberculosis (*Mycobacterium bovis*) in Madagascar.]** *Archives de l'Institut Pasteur de Madagascar*. 2003; 69 (1-2): 37-40. ISSN: 0020-2495. Note: Note: In French.

**Descriptors:** *Mycobacterium bovis*, case study, animal to human transfer, multi-drug resistant strain, Malagasy citizen.

Sinha, I.; Boon, C.; Dick, T. **Apparent growth phase-dependent phosphorylation of malonyl coenzyme A:acyl carrier protein transacylase (MCAT), a major fatty acid synthase II component in *Mycobacterium bovis* BCG.** *FEMS Microbiology Letters*. 2003; 227 (1): 141-147. ISSN: 0378-1097

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/506058/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/506058/description#description)

**NAL Call Number:** QR1.F44

**Abstract:** Probing protein extracts from exponentially growing and stationary phase cultures of *Mycobacterium bovis* BCG with anti-phospho amino acid antibodies revealed a 31-kDa anti-phospho threonine antibody-reactive protein specific to growing culture. The corresponding protein was purified via two-dimensional gel electrophoresis and identified via mass spectrometry to be malonyl coenzyme A:acyl carrier protein transacylase (MCAT), a component of the fatty acid biosynthetic pathway. MCAT tagged with histidine reacted with anti-phospho threonine antibody and was positive in an in-gel chemical assay for phospho proteins. Analysis of the growth phase dependence of MCAT-His phosphorylation and protein levels showed that phosphorylated MCAT-His can be detected only in growing culture. In contrast, MCAT-His protein level was growth phase-independent. These results suggest that MCAT may be a substrate of a protein kinase and phosphatase, and that aspects of fatty acid synthesis in tubercle bacilli are regulated by protein phosphorylation.

**Descriptors:** animal pathogenic bacteria, *Mycobacterium bovis*, phosphorylated MCAT-His, MCAT-His protein levels, fatty acid synthesis.

Smith, N.H.; Dale, J.; Inwald, J.; Palmer, S.; Gordon, S.V.; Hewinson, R.G.; Smith, J.M. **The population structure of *Mycobacterium bovis* in Great Britain: clonal expansion.** *Proceedings of the National Academy of Sciences of the United States of America*. 2003 Dec. 9; 100 (25):15271-15275. ISSN: 0027-8424

**NAL Call Number:** 500 N21P

**URL:** <http://www.pnas.org/cgi/content/full/100/25/15271>

**Abstract:** We have analyzed 11,500 isolates of *Mycobacterium bovis* (the cause of tuberculosis in cattle and other mammals) isolated in Great Britain (England, Wales and Scotland)] and characterized by spoligotype. Genetic exchange between cells is rare or absent in strains of the *Mycobacterium tuberculosis* complex so that, by using spoligotypes, it is possible to recognize "clones" with a recent common ancestor. The distribution of variable numbers of tandem repeats types in the most common clone in the data set is incompatible with random mutation and drift. The most plausible explanation is a series of "clonal expansions," and this interpretation is supported by the geographical distribution of different genotypes. We suggest that the clonal expansion of a genotype is caused either by the spread of a favorable mutation, together with all other genes present in the ancestral cell in which the mutation occurred, or by the invasion of a novel geographical region by a limited number of genotypes. A similar pattern is observed in *M. tuberculosis* (the main cause of tuberculosis in humans). The significance of clonal expansion in other bacteria that have recombination is discussed.

**Descriptors:** *Mycobacterium bovis*, animal pathogenic bacteria, population structure, mini-satellite repeats, evolution, geographical distribution, bovine tuberculosis, spoligotypes, clones with recent common ancestor, distribution of different genotypes, clonal expansion, England, Wales, Scotland.

Sreedevi, B.; Krishnappa, G. **Pathogenesis of *Mycobacterium tuberculosis* isolated from cattle.** *Indian Journal of Comparative Microbiology, Immunology and Infectious Diseases*. 2003; 24 (1): 59-62. ISSN: 0970-9320

**Descriptors:** cattle, *Mycobacterium*, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium tuberculosis* in cattle, different mycobacterial cultures, bovine macrophage cell cultures, NBT dye reduction test, disease transmission, levels of pathogenicity, phagocytosis, cattle as host organisms.

Taylor, S.J.; Ahonen, L.J.; De Leij, F.A.A.M.; Dale, J.W. **Infection of *Acanthamoeba castellanii* with *Mycobacterium bovis* and *M. bovis* BCG and survival of *M. bovis* within the amoebae.** *Applied and Environmental Microbiology*. 2003; 69 (7): 4316-4319. ISSN: 0099-2240.

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=83>

**NAL Call Number:** 448.3 Ap5

**Abstract:** Survival of *Mycobacterium bovis* after ingestion by protozoa would provide an environmental reservoir for infection of cattle. We have shown that *M. bovis* survived ingestion by *Acanthamoeba castellanii*. In contrast, two strains of *M. bovis* BCG did not survive well within *Acanthamoeba*.

**Descriptors:** possible environmental reservoir, *Mycobacterium bovis*, *Mycobacterium bovis* BCG, animal pathogenic bacteria, ingestion by *Acanthamoeba castellanii*, pathogen survival, disease reservoirs, bovine tuberculosis, soil fauna, cattle pastures.

Varela, E.; Paez, A. Montano, L.F.; Masse, F. **Isolation and characterization of *Mycobacterium bovis* 19 kDa native protein distinct from MPB 70/80.** *Molecular and Cellular Proteomics*. 2003; 2 (9): 967. ISSN: 1535-9476. Note: Meeting abstract. Meeting: HUPO (Human Proteomics Organisation) 2nd Annual and IUBMB (International Union of Biochemistry and Molecular Biology) XIX World Congress, Montreal, Quebec, Canada; October 08-11, 2003

**Descriptors:** *Mycobacterium bovis*, animal pathogen, 19-kDa-native protein characterization, isolation, MPB70-80 isoelectric focusing, electrophoretic techniques.

Zhang, XiYue; Wu, YanGong; Wang, ZhiLiang; Xu, PeiLian; Zhao, YunLing. **Study on ELISA for detecting bovine tuberculosis.** *Chinese Journal of Animal Quarantine*. 2004; 21 (7): 21-22. ISSN: 1005-944x. Note: In Chinese with an English summary.

**Descriptors:** *Mycobacterium bovis*, diagnosis, improved classical ELISA, sodium azide as protective agent, PPD coated plates, cattle serum diluent,

TMB as substrate, good specificity.

Zhang, XiYue; Wang, JunWei; Gao, YunHang; He, ZhaoYang. **Study on detection of tuberculosis antibodies in serum of cattle by Dot-IGSS.** *Journal of Jilin Agricultural University*. 2004; 26 (2): 217-219. ISSN: 1000-5684. Note: In Chinese with an English summary.

**Descriptors:** cattle, *Mycobacterium bovis*, detection of serum antibodies, Dot IGSS (Dot-immunogold silver staining, diagnostic technique).

## 2002

Gutierrez-Pabello, J.A.; McMurray, D.N.; Adams, L.G. **Upregulation of thymosin beta-10 by *Mycobacterium bovis* infection of bovine macrophages is associated with apoptosis.** *Infection and Immunity*. 2002; 70 (4): 2121-2127. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** Bovine macrophages underwent apoptosis as a result of infection with a *Mycobacterium bovis* field strain. Macrophages infected with a multiplicity of infection (MOI) of 25:1 developed chromatin condensation and DNA fragmentation at 4 h and 8 h, respectively, whereas changes in chromatin condensation induced by MOIs of 10:1 and 1:1 required more time and had a reduced number of apoptotic cells. Not only infected macrophages underwent apoptosis, but also uninfected bystander macrophages became apoptotic. Increased differential expression of thymosin beta-10 was identified in *M. bovis*-infected bovine macrophages by differential display reverse transcriptase PCR. Phagocytosis of latex beads had no effect on the expression of thymosin beta-10, whereas bacterial suspensions upregulated thymosin beta-10 expression, suggesting that *M. bovis* or mycobacterial products are essential in the process. Heat-inactivated *M. bovis* induced a slight increase in thymosin beta-10 mRNA, whereas live virulent and attenuated *M. bovis* organisms increased the gene expression almost twofold. A mouse macrophage cell line (RAW 264.7) overexpressing the bovine thymosin beta-10 transgene had spontaneous apoptosis at a higher rate (66.5%) than parental cells (4.7%) or RAW cells harboring the empty vector (22.8%). The apoptotic rates of the overexpressing cells were significantly higher when compared with both the empty vector transfected ( $P < 0.01$ ) and parental cells ( $P < 0.001$ ). Our evidence suggests that upregulation of thymosin beta-10 in *M. bovis*-infected macrophages is linked with increased cell death due to apoptosis.

**Descriptors:** molecular sequence data, cattle, messenger RNA, complementary DNA, nucleotide sequences.

Jesenska, A.; Bartos, M.; Czernekova, V.; Rychlik, I.; Pavlik, I.; Damborsky, J. **Cloning and expression of the haloalkane dehalogenase gene dhmA from *Mycobacterium avium* N85 and preliminary characterization of DhmA.** *Applied and Environmental Microbiology*. 2002. 68 (8) 3724-3730.

**NAL Call Number:** 448.3 Ap5

**Descriptors:** carbon, catalysts, cleavage, DNA cloning, enzyme activity, gene expression, genetics, genomes, halogens, *Mycobacterium avium*, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Photobacterium*, *Xylella fastidiosa*.

Kwong, L.S.; Hope, J.C.; Thom, M.L.; Sopp, P.; Duggan, S.; Bembridge, G.P.; Howard, C.J. **Development of an ELISA for bovine IL-10.** *Veterinary Immunology and Immunopathology*. 2002; 85 (3/4): 213-223. ISSN: 0165-2427

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Abstract:** The objective of the study was to develop an assay for bovine IL-10 that could be applied to analyses of immune responses and advance understanding of a variety of diseases of cattle. Recombinant bovine IL-10 (rbo IL-10) was transiently expressed in Cos-7 cells and shown to inhibit the synthesis of IFNgamma by bovine cells stimulated with antigen in vitro. Mice were immunised with a plasmid containing a cDNA insert encoding rbo IL-10 and inoculated with rbo IL-10. A number of monoclonal antibodies (mab) were generated that reacted with rbo IL-10 in an ELISA. Some of these mab neutralised the ability of rbo IL-10 to inhibit IFNgamma synthesis by antigen-stimulated bovine cells. A pair of mabs was identified that together could be used to detect both recombinant and natural bovine IL-10 present in supernatant of PBMC stimulated with ConA. A luminescent detection method was applied to the ELISA making it more sensitive. Using this method native IL-10 was detected in supernatants of PBMC, diluted blood and undiluted blood from cattle immunised with *Mycobacterium bovis* BCG or ovalbumin and incubated in vitro with antigen indicating the applicability of the assay to a number of in vitro culture systems.

**Descriptors:** cattle, interleukin 10, ELISA, monoclonal antibodies, interferon, recombinant DNA, complementary DNA, protein synthesis, inhibition.

Lysenko, A.P.; Krasnikova, E.L.; Poloz, A.I. **Morphological characteristics of *Mycobacterium* species cultured in new VKG medium.** *Veterinarnaya Nauka Proizvodstvu*. 2002; (36): 69-75. Note: In Russian.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium fortuitum*, *Mycobacterium tuberculosis*, bacteriology, culture media effects, VKG medium.

Milian-Suazo, F.; Banda-Ruiz, V.; Ramirez-Casillas, C.; Arriaga-Diaz, C. **Genotyping of *Mycobacterium bovis* by geographic location within Mexico.** *Preventive Veterinary Medicine*. 2002. 55 (4) 255-264.

**NAL Call Number:** SF601 P7

**Descriptors:** spoligotyping, differentiate 62 *Mycobacterium bovis* isolates, dairy cattle, genetic differences, detection of infection sources.

Niemann, S.; Richter, E.; Rusch-Gerdes, S. **Biochemical and genetic evidence for the transfer of *Mycobacterium tuberculosis* subsp. *caprae* Aranaz et al. 1999 to the species *Mycobacterium bovis* Karlson and Lessel 1970 (Approved Lists 1980) as *Mycobacterium bovis* subsp. *caprae* comb. nov.** *International Journal of Systematic and Evolutionary Microbiology*. Mar 2002. 52 (pt.2) 433-436. ISSN: 1466-5026.

**URL:** <http://ijs.sgmjournals.org/>

**NAL Call Number:** QR1.I577

**Descriptors:** new combination, new subspecies, descriptions, taxonomy, chemotaxonomy, *Mycobacterium bovis* ssp. *caprae*.

Nishimori, K.; Uchida, I.; Tanaka, K.; Nishimori, T.; Imai, K.; Kashiwazaki, Y.; Murata, N.; Jinma, K. **Molecular epidemiological manual for *Mycobacterium tuberculosis* complex and *Mycobacterium avium* using VNTR (Variable Numbers of Tandem Repeats) typing.** *Bulletin of the National Institute of Animal Health*. 2002, No.109, 25-32. ISSN: 1347-2542 Note: In Japanese with an English summary.

**NAL Call Number:** 41.9 T572

**Descriptors:** bacterial typing, *Mycobacterium avium*, *Mycobacterium tuberculosis*, molecular epidemiology, phylogeny.

Poloz, A.I.; Lysenko, A.P.; Krasnikova, E.L. [Differential diagnosis of *Mycobacterium tuberculosis* and atypical *Mycobacterium* strains using immunofluorescent microscopy.] *Veterinarnaya Nauka Proizvodstvu*. 2002; (36): 141-144. Note: In Russian.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, differential diagnosis, immunofluorescence, diagnostic techniques, strain differences.

Roring, S.; Scott, A.; Brittain, D.; Walker, I.; Hewinson, G.; Neill, S.; Skuce, R. Development of variable-number tandem repeat typing of *Mycobacterium bovis*: comparison of results with those obtained by using existing exact tandem repeats and spoligotyping. *Journal of Clinical Microbiology*. 2002; 40 (6): 2126-2133. ISSN: 0095-1137

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1489394>

**NAL Call Number:** QR46.J6

**Descriptors:** *Mycobacterium bovis*, repetitive DNA.

Shah, D.H.; Verma, R.; Bakshi, C.S.; Singh, R.K. A multiplex-PCR for the differentiation of *Mycobacterium bovis* and *Mycobacterium tuberculosis*. *FEMS Microbiology Letters*. Aug 27, 2002. 214 (1) 39-43. ISSN: 0378-1097

**NAL Call Number:** QR1.F44

**Abstract:** A multiplex-polymerase chain reaction (PCR) assay based on one-step amplification and detection of two different mycobacterial genomic fragments was designed for differentiation of *Mycobacterium bovis* and *Mycobacterium tuberculosis*. The oligonucleotide primers were chosen from a 500-bp genomic fragment which is well conserved in *M. bovis* and the *pncA* gene (based on *M. tuberculosis*-specific nucleotide polymorphism, a cytosine residue at position 169), specific for *M. tuberculosis*. The multiplex-PCR allowed detection of a single product of 500 bp in *M. bovis* isolates while *M. tuberculosis* isolates generated a single product of 185 bp, with or without an additional product of 500 bp. None of the atypical mycobacterial isolates revealed any amplification products. The method was found to be highly specific and could detect as little as 20 pg of pure DNA. This multiplex-PCR assay, based on the 500-bp fragment and the *pncA* gene, may be very useful for the rapid and specific differentiation of these two closely related mycobacteria and easy to use in medical and veterinary microbiological laboratories.

**Descriptors:** polymerase chain reaction, multiplex polymerase chain reaction, species differentiation, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, rapid testing method.

Shyam Unniraman; Monalisa Chatterji; Valakunja Nagaraja. DNA gyrase genes in *Mycobacterium tuberculosis*: a single operon driven by multiple promoters. *Journal of Bacteriology*. 2002. 184 (19) 5449-5456. ISSN: 0021-9193

**NAL Call Number:** 448.3 J822

**Descriptors:** auto-regulation, genes, genomes, isomerases, molecular genetics, nucleotide sequences, operons, promoters, transcription, *Mycobacterium tuberculosis*, DNA topoisomerase (ATP hydrolysing).

Roring, S.; Scott, A.; Brittain, D.; Walker, I.; Hewinson, G.; Neill, S.; Skuce, R. Development of variable-number tandem repeat typing of *Mycobacterium bovis*: comparison of results with those obtained by using existing exact tandem repeats and spoligotyping. *Journal of Clinical Microbiology*. 2002. 40 (6) 2126-2133.

**NAL Call Number:** QR46.J6

**Descriptors:** fingerprinting, *Mybacterium tuberculosis* complex, RFLP typing, alleles, genes, genetic polymorphism, loci, molecular genetics, nucleotide sequences, repetitive DNA, restriction fragment length polymorphism, *Mycobacterium bovis*.

Skuce, R.A.; McCorry, T.P.; McCarroll, J.F.; Roring, S.M.M.; Scott, A.N.; Brittain, D.; Hughes, S.L.; Hewinson, R.G.; Neill, S.D. Discrimination of *Mycobacterium tuberculosis* complex bacteria using novel VNTR-PCR targets. *Microbiology*. Feb 2002. 148 (pt.2) 519-528. ISSN: 1350-0872

**NAL Call Number:** QR1.J64

**Descriptors:** *Mycobacterium bovis*, bovine tuberculosis, variable number tandem repeats, polymerase chain reaction, spoligotyping.

Smits, T.H.M.; Balada, S.B.; Witholt, B.; van Beilen, J.B. Functional analysis of alkane hydroxylases from gram-negative and gram-positive bacteria. *Journal of Bacteriology*. 2002. 184 (6) 1733-1742.

**NAL Call Number:** 448.3 J82

**Descriptors:** alkanes, amino acid sequences, enzyme activity, gene expression, genetic analysis, gram negative bacteria, gram positive bacteria, oxidoreductases, oxygenases, soil bacteria, *Acinetobacter*, *Escherichia coli*, *Mycobacterium tuberculosis*, *Pseudomonas aeruginosa*, *Pseudomonas fluorescens*, *Pseudomonas putida*, *Alcanivorax borkumensis*, *Prauserella rugosa*, rubredoxin NAD+-reductase.

Ucko, M.; Colorni, A.; Kvitt, H.; Diamant, A.; Zlotkin, A.; Knibb, W.R. Strain variation in *Mycobacterium marinum* fish isolates. *Applied and Environmental Microbiology*. ISSN: 0099-2240 Nov 2002, 7(11) 6114-6120.

**NAL Call Number:** 448.3 AP5

**Descriptors:** fish pathogen, *Mycobacterium marinum*, genetics, strain variations.

Welsh, M.D.; Kennedy, H.E.; Smyth, A.J.; Girvin, R.M.; Andersen, P.; Pollock, J.M. Responses of bovine WC1+ gammadelta T cells to protein and nonprotein antigens of *Mycobacterium bovis*. *Infectious Immunity*. 2002; 70 (11): 6114-6120. ISSN: 0019-9567.

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** WC1(+) gammadelta T cells of *Mycobacterium bovis*-infected cattle are highly responsive to *M. bovis* sonic extract (MBSE). In mycobacterial infections of other species, gammadelta T cells have been shown to respond to protein and nonprotein antigens, but the bovine WC1(+) gammadelta T-cell antigenic targets within MBSE require further definition in terms of the dominance of protein versus nonprotein components. The present study sought to characterize the WC1(+) gammadelta T-cell antigenic targets, together with the role of interleukin-2 (IL-2), in the context of *M. bovis* infection. This was achieved by testing crude and defined antigens to assess protein versus nonprotein recognition by WC1(+) gammadelta T cells in comparison with CD4(+) alpha beta T cells. Both cell types proliferated strongly in response to MBSE, with CD4(+) T cells being the major producers of gamma interferon (IFN-gamma). However, enzymatic digestion of the protein in MBSE removed its ability to stimulate CD4(+)

T-cell responses, whereas some WC1(+) gammadelta T-cell proliferation remained. The most antigenic protein inducing proliferation and IFN-gamma secretion in WC1(+) gammadelta T-cell cultures was found to be ESAT-6, which is a potential novel diagnostic reagent and vaccine candidate. In addition, WC1(+) gammadelta T-cell proliferation was observed in response to stimulation with prenyl pyrophosphate antigens (isopentenyl pyrophosphate and monomethyl phosphate). High levels of cellular activation (CD25 expression) resulted from MBSE stimulation of WC1(+) gammadelta T cells from infected animals. A similar degree of activation was induced by IL-2 alone, but for WC1(+) gammadelta T-cell division IL-2 was found to act only as a costimulatory signal, enhancing antigen-driven responses. Overall, the data indicate that protein antigens are important stimulators of WC1(+) gammadelta T-cell proliferation and IFN-gamma secretion in *M. bovis* infection, with nonprotein antigens inducing significant proliferation. These findings have important implications for diagnostic and vaccine development.

**Descriptors:** T lymphocytes, the WC1(+) gammadelta T-cell antigenic targets, bacterial antigens, lymphocyte transformation.

## 2001

Arraiz, N.; Takiff, H. **Analisis de ARNm de un factor de supervivencia en micobacterias. [mRNA analysis of a survival factor in mycobacteria.]** *Kasmera*. 2001. 29 (1) 65-82. Note: In Spanish with an English summary.

**Descriptors:** *Mycobacterium tuberculosis*, *Mycobacterium bovis* BCG, the sigma ECF factor SuoM, SuoM-lac Z, transcriptional fusion reporters, beta-glactosidase activity, heat shock effects, cell growth, survival functions.

Caimi, K.; Romano, M.I.; Alito, A.; Zumarraga, M.; Bigi, F.; Cataldi, A. **Sequence analysis of the direct repeat region in *Mycobacterium bovis*.** *Journal of Clinical Microbiology*. 2001. 39 (3) 1067-1072.

**NAL Call Number:** QR46.J6

**Descriptors:** DNA sequencing, *Mycobacterium bovis*, nucleotide sequences, cattle tuberculosis.

Chambers, M.A.; Williams, A.; Gavier-Widen, D.; Whelan, A.; Hughes, C.; Hall, G.; Lever, M.S.; Marsh, P.D.; Hewinson, R.G. **A guinea pig model of low-dose *Mycobacterium bovis* aerogenic infection.** *Veterinary Microbiology*. 2001; 80 (3): 213-226. ISSN: 0378-1135.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** In order to develop a model of *Mycobacterium bovis* infection with pathogenetical relevance, a modified version of the Henderson apparatus was used to deliver infectious aerosols directly to the snouts of guinea pigs. Aerosols generated from 10(6), 10(7), 10(8) CFU/ml *M. bovis* suspensions established disease in every animal, with estimated retained doses of 10, 100, 1000 CFU, respectively. For comparison, other guinea pigs were inoculated with 100 CFU *M. bovis* intramuscularly (i.m.). Pathology and bacterial colonisation of lungs and spleen varied according to the dose and route of inoculation. Animals inoculated i.m. gave a significant cutaneous tuberculin hypersensitivity reaction earlier after testing than those infected aerogenically. A serological response to *M. bovis* antigens was detected in all infected animals. Intensity of antigen recognition was dose-dependent and although the range of antigens recognised varied between animals, a 25 kDa antigen present in the cell fraction was serodominant.

Thus, a reproducible guinea pig model has been defined that may be suitable for virulence, vaccination, and immunological studies.

**Descriptors:** guinea pigs, *Mycobacterium bovis*, experimental infections, animal models, disease models, inoculum density, pathogenesis, airborne infection, intramuscular injection, application methods, lungs, spleen, colonization, antigens, dosage effects.

Clifton-Hadley, Richard S.; Sauter Louis, Carola M.; Lugton, Ian W.; Jackson, Ronald; Durr, Peter A.; Wilesmith, John W. **Mycobacterial diseases. *Mycobacterium bovis* infections.** In: Elizabeth S. Williams; Ian K. Barker (editors). *Infectious diseases of wild mammals*. Third edition. Iowa State University Press, Ames. 2001: 340-361. ISBN: 0813825563

**Descriptors:** *Mycobacterium*, *Mycobacterium bovis*, ferrets (*Mustela putorius furo*), badgers (*Meles meles*), brush tailed possums (*Trichosurus vulpecula*) wildlife as disease reservoirs, domestic animals, cattle, zoonotic diseases.

Collins, D.M.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Virulence factors of *Mycobacterium bovis*.** *Tuberculosis*. 2001. 81 (1-2) 97-102. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** genes, mutant strains, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, disease screening for virulence, cattle.

Dannenberg, A.M. Jr.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Pathogenesis of pulmonary *Mycobacterium bovis* infection: basic principles established by the rabbit model.** *Tuberculosis*. 2001. 81 (1-2) 87-96. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** pathogenesis, rabbit disease model, *Mycobacterium bovis* strains, species differences, antibodies, antigens, cell mediated immunity, immune response, chemokines, cytokines, delayed type hypersensitivity, disease control, experimental infections, laboratory animals, lungs, macrophage activation, respiratory diseases, T lymphocytes, tuberculosis.

De Mendonca-Lima, L.; Picardeau, M.; Raynaud, C.; Rauzier, J.; de la Salmoniere, Y.O.G.; Barker, L.; Bigi, F.; Cataldi, A.; Gicquel, B.; Reyrat, J.M. **Erp, an extracellular protein family specific to mycobacteria.** *Microbiology*. 2001. 147 (8) 2315-2320.

**NAL Call Number:** QR1.J64

**Descriptors:** exported repeated protein, *Mycobacterium*, *Mycobacterium tuberculosis*, *Mycobacterium smegmatis*, ubiquitous extracellular protein, genetic conservation.

Gordon, S.V.; Eiglmeier, K.; Garnier, T.; Brosch, R.; Parkhill, J.; Barrell, B.; Cole, S.T.; Hewinson, R.G.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Genomics of *Mycobacterium bovis*.** *Tuberculosis*. 2001. 81 (1-2) 157-163. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000

**Descriptors:** genetic variation, genetics, genomes, nucleotide sequences, *Mycobacterium bovis*, BCG strain, *Mycobacterium tuberculosis*, pathogenicity, phenotypes, proteins, virulence, reviews.

Haddad, N.; Durand, B. **Interet et limites des differentes techniques de caracterisation des isolats. Exemple de la tuberculose. [Interest and limits of different technics for the study of strains: Example of tuberculosis.]** *Epidemiologie et Sante Animale*. 2001. No. 39, 43-57. Note: In

French with an English summary.

**Descriptors:** epidemiology, molecular biology, tuberculosis, *Mycobacterium*.

Haddad, N.; Ostyn, A.; Karoul, C.; Masselot, M.; Thorel, M.F.; Hughes, S.L.; Inwald, J.; Hewinson, R.G.; Durand, B. **Spoligotype diversity of *Mycobacterium bovis* strains isolated in France from 1979 to 2000.** *Journal of Clinical Microbiology*. Oct 2001. 39 (10) 3623-3632. ISSN: 0095-1137

**NAL Call Number:** QR46.J6

**Descriptors:** cattle tuberculosis, strains, genetic diversity, *Mycobacterium*.

Hotter, G.S.; Wilson, T.; Collins, D.M. **Identification of a cadmium-induced gene in *Mycobacterium bovis* and *Mycobacterium tuberculosis*.** *FEMS Microbiology Letters*. June 25, 2001. 200 (2) 151-155. ISSN: 0378-1097

**NAL Call Number:** QR1.F44

**Abstract:** A 17-kDa protein (CadI) was induced by cadmium in *Mycobacterium bovis* and *Mycobacterium tuberculosis*. Comparison of the N-terminal sequence from *M. bovis* CadI with the annotated *M. tuberculosis* genome database identified Rv2641 as the encoding gene. Long and short promoter fragments from *M. bovis* cadI were fused to the lacZ reporter gene in pYUB76. Only the long fragment directed cadmium-inducible activity when electroporated into *M. bovis*. The CadI promoter has potential for both constitutive and inducible expression studies in *M. bovis* and *M. tuberculosis*.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, CadI, cadmium, genetics, promoter fragments, lacZ reporter gene, expression studies.

Inglis, N.F.; Stevenson, K.; Davies, R.C.; Heaslip, D.G.; Sharp, J.M. **Unique expression of a highly conserved mycobacterial gene in IS901+ *Mycobacterium avium*.** *Microbiology*. June 2001. 147 (pt. 6) 1557-1564. ISSN: 1350-0872

**NAL Call Number:** QR1.J64

**Abstract:** Expression of a gene encoding a novel protein antigen of 40 kDa (p40) was detected in IS901+ strains of *Mycobacterium avium*, but not in any other species or subspecies of *Mycobacterium* tested, including IS901- *M. avium* and the other members of the *M. avium* complex. Although Southern hybridization revealed that the p40 gene is widely distributed within the genus, expression of the antigen could not be detected on Western blots of mycobacterial cell lysates. Nucleotide sequence analysis of the cloned p40 gene, and a database search, revealed high levels of sequence identity with a homologous gene in IS901- *M. avium*, *M. avium* subsp. *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium leprae*, *Mycobacterium smegmatis* and *Mycobacterium tuberculosis*. Further analysis of upstream sequences identified a putative promoter region. The p40 gene is the first example of a gene that is widely distributed within the genus *Mycobacterium* but expressed only in association with the presence of a genomic insertion element, in this case IS901, in strains of *M. avium* isolated from birds and domestic livestock.

**Descriptors:** *Mycobacterium avium*, *Mycobacterium avium* subsp. *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium leprae*, *Mycobacterium smegmatis*, *Mycobacterium tuberculosis*, novel protein antigen, Western blot method.

Kato, Maeda M.; Rhee, J.T.; Gingeras, T.R.; Salamon, H.; Drenkow, J.; Smittipat, N.; Small, P.M. **Comparing genomes within the species *Mycobacterium tuberculosis*.** *Genome Research*. 2001. 11 (4) 547-554.

**NAL Call Number:** QP606 D46P34

**Descriptors:** genetic variability, natural populations of *Mycobacterium tuberculosis*, evolution, pathogenesis, small scale genomic deletions, 19 isolates.

Kauppinen, J.; Hintikka, E.L.; Iivanainen, E.; Katila, M.L. **PCR-based typing of *Mycobacterium avium* isolates in an epidemic among farmed lesser white-fronted geese (*Anser erythropus*).** *Veterinary Microbiology*. July 3, 2001. 81 (1) 41-50. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Abstract:** *Mycobacterium avium* is an important veterinary pathogen causing avian tuberculosis in birds. The aim of the study was to evaluate the genetic relatedness in *M. avium* isolates from deep tissues of farmed lesser white-fronted geese with avian tuberculosis and in samples from the farm environment. The strains were analyzed by two PCR-based typing methods, inverted repeat (IR) typing and random amplified polymorphic DNA (RAPD) analysis. The primers for the inverted repeats of the insertion sequences IS1245 and IS1311 were used in IR typing, and the RAPD analysis was performed with six primers. Seven of the nine avian strains yielded an identical pattern in the IR typing, but they could be divided into two groups in the RAPD analysis. The remaining two bird isolates had an identical IR pattern (IR cluster II) which they shared with two environmental isolates. However, the RAPD analysis revealed that these environmental isolates had a RAPD pattern (RAPD cluster VI) distinct and different from either of the bird isolates (RAPD clusters II and IV). In all, four *M. avium* strains were verified as being inducers of avian tuberculosis in birds, and all were distinct from the three environmental strains identified. Thus, the results did not confirm the preliminary idea that a single strain had caused the epidemic. The polymorphism among *M. avium* strains highlighted the great biodiversity among an *M. avium* population even in a limited environmental setting during a short time span, and indicated the high susceptibility to avian tuberculosis of lesser white-fronted geese.

**Descriptors:** *Anser erythropus*, geese, *Mycobacterium avium*, polymerase chain reaction, genotypes, identification, strain differences, genetic distance, random amplified polymorphic DNA, nucleotide sequences, epidemics, genetic diversity, susceptibility.

Koul, A.; Choidas, A.; Tyagi, A.K.; Drlica, K.; Singh, Y.; Ullrich, A. **Serine/threonine protein kinases PknF and PknG of *Mycobacterium tuberculosis*: characterization and localization.** *Microbiology*. 2001. 147 (8) 2307-2314.

**NAL Call Number:** QR1.J64

**Descriptors:** serine protein kinases, threonine protein kinases, genes, phosphorylation, trans-membrane proteins, *Mycobacterium bovis*, *Mycobacterium smegmatis*, *Mycobacterium tuberculosis*, pathogenesis, cellular signaling network.

Li, MingShi; Monahan, I.M.; Waddell, S.J.; Mangan, J.A.; Martin, S.L.; Everett, M.J.; Butcher, P.D. **cDNA-RNA subtractive hybridization reveals increased expression of mycocerosic acid synthase in intracellular *Mycobacterium bovis* BCG.** *Microbiology*. 2001. 147 (8) 2293-2305.

**NAL Call Number:** QR1.J64

**Descriptors:** gene expression, genes, ligases, macrophages, molecular genetics, *Mycobacterium bovis*, mycocerosic acids.

Njanpop-Lafourcade, B.M.; Inwald, J.; Ostyn, A.; Durand, B.; Hughes, S.; Thorel, M.F.; Hewinson, G.; Haddad, N. **Molecular typing of**

***Mycobacterium bovis* isolates from Cameroon.** *Journal of Clinical Microbiology*. Jan 2001. 39 (1) 222-227. ISSN: 0095-1137

**NAL Call Number:** QR46.J6

**Descriptors:** molecular epidemiology, 75 *Mycobacterium bovis* isolates, spoligotyping, pulsed-field gel electrophoresis, PFGE, restriction fragment length polymorphism, RFLP, probe IS6110-RHS, homogeneity, geographical mapping of strains, cattle tuberculosis, biochemical techniques, control of disease, cattle, Cameroon.

Olsen, I.; Tryland, M.; Wiker, H.G.; Reitan, L.J. **AhpC, AhpD, and a secreted 14-kilodalton antigen from *Mycobacterium avium* subsp. *paratuberculosis* distinguish between paratuberculosis and bovine tuberculosis in an enzyme-linked immunosorbent assay.** *Clinical and Diagnostic Laboratory Immunology*. 2001. 8 (4) 797-801.

**Descriptors:** *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium bovis*, experimental infection, ELISA, species identification, antibodies, differential diagnostic techniques, antibody testing, sera.

Rastogi, N.; Legrand, E.; Sola, C. **The mycobacteria: an introduction to nomenclature and pathogenesis.** *Revue Scientifique et Technique Office International des Epizooties*. 2001. 20 (1) 21-54. Note: In English with French and Spanish summaries.

**NAL Call Number:** SF781 R4

**Descriptors:** nomenclature, diagnosis, macrophages, mycobacterial diseases, pathogenesis, phylogeny, taxonomy, tuberculosis, *Actinomycetales*, *Mycobacteriaceae*, *Mycobacterium leprae*, *Mycobacterium tuberculosis*.

Sales, M.P.U.; Taylor, G.M.; Hughes, S.; Yates, M.; Hewinson, G.; Young, D.B.; Shaw, R.J. **Genetic diversity among *Mycobacterium bovis* isolates: a preliminary study of strains from animal and human sources.** *Journal of Clinical Microbiology*. 2001; 39 (12): 4558-4562.

**URL:** <http://jcm.asm.org/cgi/content/full/39/12/4558>

**NAL Call Number:** QR46.J6

**Descriptors:** *Mycobacterium bovis*, genetic studies, bacterial strains, mycobacterial diseases, human, animals, livestock, wild animals.

Sechi, L.A.; Zanetti, S.; Sanguinetti, M.; Mollicotti, P.; Romano, L.; Leori, G.; Delogu, G.; Boccia, S.; la Sorda, M.; Fadda, G. **Molecular basis of rifampin and isoniazid resistance in *Mycobacterium bovis* strains isolated in Sardinia, Italy.** *Antimicrobial Agents and Chemotherapy*. 2001. 45 (6) 1645-1648.

**NAL Call Number:** RM265 A5132

**Descriptors:** cattle, antimycobacterial agents, drug resistance, genetic analysis, isoniazid, leucine, mutations, nucleotide sequences, praline, rifampicin, strains, *Mycobacterium bovis*, Italy.

Siellaff, B.; Andreesen, J.R.; Schraeder, T. **A cytochrome P450 and a ferredoxin isolated from *Mycobacterium* sp. strain HE5 after growth on morpholine.** *Applied Microbiology and Biotechnology*. 2001, 56 (3/4) 458-464. ISSN: 0175-7598.

**NAL Call Number:** QR1.E9

**Descriptors:** *Mycobacterium* strain HE5, *Mycobacterium smegmatis*, amino acid sequence, culture media, ferredoxin, iron-sulfur protein, molecular weight, cytochrome 450, morpholine, carbon and nitrogen sources, carbon monoxide, piperidine, pyrrolidine.

Skuce, R.A.; Neill, S.D.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Molecular epidemiology of *Mycobacterium bovis*: exploiting molecular data.** *Tuberculosis*. 2001. 81 (1-2) 169-175. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** antigenic variation, disease transmission, epidemiology, molecular epidemiology, molecular genetics, mycobacterial diseases, pathogenesis, *Mycobacterium bovis* strains, virulence, cattle, wild animals, wildlife, zoonotic diseases, New Zealand, reviews.

Smith, R.A.; Alvarez, A.J.; Estes, D.M. **The P2X7 purinergic receptor on bovine macrophages mediates mycobacterial death.** *Veterinary Immunology and Immunopathology*. 2001; 78 (3/4): 249-262. ISSN: 0165-2427

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Abstract:** P2X7 is an ATP gated purinoceptor that has been linked to various immune responses. P2X7 appears to be expressed ubiquitously in the immune system and thus may be important as an effector pathway or play significant roles in cell activation/death. 2',3'-(4-Benzoyl)benzoyl ATP is the most potent agonist of this receptor and ATP in its fully dissociated form (ATP(4-)) also activates the receptor. High concentrations of ATP can cause the P2X7 receptor to induce pore formation on the surface of the cell that allows molecules of considerable size to pass and can lead to cell death. The P2X7 receptor has also been linked to various immune activities when the concentration of ATP is lower, including the release of IL-1beta. The role P2X7 receptors have on immune cell activities is just beginning to be understood. We sought to determine the role of P2X7 on bovine macrophages in eliminating the causative agent of bovine-type tuberculosis, *Mycobacterium bovis*. Because high concentrations of ATP are linked to macrophage death, we determined if this method of cell destruction also leads to reduced bacterial viability. We find that P2X7 is present on bovine macrophages from different sources, including both peripheral blood-derived as well as alveolar macrophages. In addition, P2X7 mRNA is present in B and T lymphocytes. The treatment of *M. bovis*-infected macrophages with ATP results in reduced macrophage viability as well as reduced *M. bovis* viability.

**Descriptors:** cattle, macrophages, *Mycobacterium bovis* BCB-strain, receptors, messenger RNA, viability, death, cell growth, ATP, B Lymphocytes, T lymphocytes.

Smyth, A.J.; Welsh, M.D.; Girvin, R.M.; Pollock, J.M. **In vitro responsiveness of gamma delta T cells from *Mycobacterium bovis*-infected cattle to mycobacterial antigens: predominant involvement of WC1+ cells.** *Infection and Immunity*. 2001; 69 (1): 89-96. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** It is generally accepted that protective immunity against tuberculosis is generated through the cell-mediated immune (CMI) system, and a greater understanding of such responses is required if better vaccines and diagnostic tests are to be developed. gammadelta T cells from a major proportion of the peripheral blood mononuclear cells (PBMC) in the ruminant system and, considering data from other species, may have a significant role in CMI responses in bovine tuberculosis. This study compared the in vitro responses of alphabeta and gammadelta T cells from

*Mycobacterium bovis*-infected and uninfected cattle. The results showed that, following 24 h of culture of PBMC with *M. bovis*-derived antigens, the majority of gammadelta T cells from infected animals became highly activated (upregulation of interleukin-2R), while a lower proportion of the alphabetaT-cell population showed activation. Similar responses were evident to a lesser degree in uninfected animals. Study of the kinetics of this response showed that gammadelta T cells remained significantly activated for at least 7 days in culture, while activation of alphabeta T cells declined during that period. Subsequent analysis revealed that the majority of activated gammadelta T cells expressed WC1, a 215-kDa surface molecule which is not expressed on human or murine gammadelta T cells. Furthermore, in comparison with what was found for CD4+ T cells, *M. bovis* antigen was found to induce strong cellular proliferation but relatively little gamma interferon release by purified WC1+ gammadelta T cells.

Overall, while the role of these cells in protective immunity remains unclear, their highly activated status in response to *M. bovis* suggests an important role in antimycobacterial immunity, and the ability of gammadelta T cells to influence other immune cell functions remains to be elucidated, particularly in relation to CMI-based diagnostic tests.

**Descriptors:** T lymphocytes, cell mediated immunity, bacterial antigens.

Sun, Z.; Cheng, S.J.; Zhang, H.; Zhang, Y. **Salicylate uniquely induces a 27-kDa protein in tubercle bacillus.** *FEMS Microbiology Letters*. Sept 25, 2001. 203 (2) 211-216. ISSN: 0378-1097

**NAL Call Number:** QR1.F44

**Abstract:** Salicylate was found to uniquely induce a 27-kDa protein in *Mycobacterium tuberculosis* complex organisms but not in *Mycobacterium smegmatis* or *Escherichia coli*. The structural analogue antitubercular para-amino-salicylate also induced the 27-kDa protein but to a somewhat lower level than salicylate. Other structural analogues such as benzoic acid and acetyl salicylic acid (aspirin) did not induce the 27-kDa protein. Western blot analysis indicated that the 27-kDa protein was localized mainly in the cytoplasm. The 27-kDa protein was not expressed at different growth phases in the absence of salicylate. The 27-kDa protein was identified as a putative benzoquinone methyltransferase (Rv0560c), which has several homologues in the *M. tuberculosis* genome. The cloned 27-kDa gene was found to express constitutively in *E. coli*, *M. smegmatis* and BCG with or without salicylate.

**Descriptors:** salicylates, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium smegmatis*, *E. coli*, phytochemicals.

Thorel, M.F.; Huchzermeyer, H.F.; Michel, A.L. ***Mycobacterium avium* and *Mycobacterium intracellulare* infection in mammals.** *Revue Scientifique et Technique Office International des Epizooties*. 2001. 20 (1) 204-218. Note: In English with French and Spanish summaries.

**NAL Call Number:** SF781 R4

**Descriptors:** domestic animals, immunosuppression, post slaughter survey, soil microbes, tuberculosis, water, cats, dogs, small mammals, wild animals, wild birds, zoonotic diseases.

Willumsen, P.A.; Nielsen, J.K.; Karlson, U. **Degradation of phenanthrene-analogue azaarenes by *Mycobacterium gilvum* strain LB307T under aerobic conditions.** *Applied Microbiology and Biotechnology*. 2001, 56 (3/4) 539-544. ISSN: 0175-7598.

**NAL Call Number:** QR1.E9

**Descriptors:** *Mycobacterium gilvum*, bacterial biodegradation of azaarenes, 5,6-benzoquinoline, 7,8-benzoquinoline, phenanthridine, aromatic hydrocarbons, sources of carbon, nitrogen and energy, substrates concentration levels.

Zanini, M.S.; Moreira, E.C.; Lopes, M.T.P.; Oliveira, R.S.; Leao, S.C.; Fioravanti, R.L.; Roxo, E.; Zumarraga, M.; Romano, M.I.; Cataldi, A.; Salas, C.E. ***Mycobacterium bovis*: polymerase chain reaction identification in bovine lymphonode biopsies and genotyping in isolates from Southeast Brazil by spoligotyping and restriction fragment length polymorphism.** *Memorias do Instituto Oswaldo Cruz*. 2001. 96 (6) 809-813.

**NAL Call Number:** 448.9 IN74

**Descriptors:** diagnostic techniques, genotypes, lymph nodes, polymerase chain reaction, polymorphism, cattle, *Mycobacterium bovis*.

## 2000

Bigi, F.; Aito, A.; Romano, M.I.; Zumarraga, M.; Caimi, K.; Cataldi, A. **The gene encoding P27 lipoprotein and a putative antibiotic-resistance gene form an operon in *Mycobacterium tuberculosis* and *Mycobacterium bovis*.** *Microbiology*. 2000. 146 (4) 1011-1018.

**NAL Call Number:** QR1 J64

**Descriptors:** lipoproteins, *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain, *Mycobacterium tuberculosis*, *Mycobacterium smegmatis*, genes, operons, promoters, antibiotics, drug resistance.

Braibant, M.; Gilot, P.; Content, J. **The ATP binding cassette (ABC) transport systems of *Mycobacterium tuberculosis*.** *FEMS Microbiology Reviews*. 2000, 24 (4) 449-467. ISSN: 0168-6445.

**NAL Call Number:** QR1.F46

**Descriptors:** *Mycobacterium tuberculosis*, inventory and assembly of subunits of ABC transporter genes, transporter genes occupy 2.5% of genome, genome analysis, antibiotic resistance, amino acid sequences, control resistance, proteins, bacterial attachment control, bacterial ability to synthesize essential compounds, few external essential compounds.

Coetsier, C.; Vannuffel, P.; Blondeel, N.; Deneff, J.F.; Cocito, C.; Gala, J.L. **Duplex PCR for differential identification of *Mycobacterium bovis*, *M. avium*, and *M. avium* ssp. *paratuberculosis* in formalin-fixed paraffin-embedded tissues from cattle.** *Journal of Clinical Microbiology*. 2000. 38 (8) 3048-3054.

**NAL Call Number:** QR46.J6

**Descriptors:** cattle, deletions, differential diagnosis, DNA sequencing, genes, identification, nucleotide sequences, open reading frames, paratuberculosis, PCR, polymerase chain reaction, tuberculosis, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium tuberculosis*.

Domingues-Junior, M.; Pinheiro, S.R.; Guerra, J.L.; Palermo-Neto, J. **Effects of treatment with amphetamine and diazepam on *Mycobacterium bovis*-induced infection in hamsters.** *Immunopharmacology and Immunotoxicology*. 2000. 22 (3) 555-574.

**NAL Call Number:** RM370 I55

**Descriptors:** hamster disease model, tuberculosis, *Mycobacterium bovis*, amphetamine (AMPH) and diazepam, impaired immune defense, effects of

drugs on macrophage/lymphocyte activity.

Durr, P.A.; Hewinson, R.G.; Clifton-Hadley, R.S. **Molecular epidemiology of bovine tuberculosis. I. *Mycobacterium bovis* genotyping.** *Revue Scientifique et Technique, Office International des Epizooties*. 2000. 19 (3) 675-688. Note: In English with Spanish and French summaries.

**NAL Call Number:** SF781 R4

**Descriptors:** molecular epidemiology, *Mycobacterium bovis*, tuberculosis, epidemiology, restriction endonuclease analysis, restriction fragment length polymorphism, PCR, polymerase chain reaction, nucleotide sequences, cattle.

Durr, P.A.; Clifton-Hadley, R.S.; Hewinson, R.G. **Molecular epidemiology of bovine tuberculosis. II. Applications of genotyping.** *Revue Scientifique et Technique, Office International des Epizooties*. 2000. 19 (3) 689-701. Note: In English with Spanish and French summaries.

**NAL Call Number:** SF781 R4

**Descriptors:** cattle, molecular epidemiology, genotypes, *Mycobacterium bovis*, tuberculosis, restriction endonuclease analysis, restriction fragment length polymorphism, nucleotide sequences.

Hatfull, Graham F.; Jacobs, William R. *Molecular genetics of mycobacteria*. Washington, D.C.: ASM Press, c2000. xii, 363 p. ISBN: 1555811914

**NAL Call Number:** QR82.M8 M64 2000

**Descriptors:** *Mycobacterium*, bacterial genetics, tuberculosis, genetic aspects.

McGraw, L. **Zoonoses.** *Agricultural Research*. Feb 2000. 48 (2) 18-20. ISSN: 0002-161X.

**URL:** <http://www.ars.usda.gov/is/AR/>

**NAL Call Number:** 1.98 Ag84

**Descriptors:** leptospirosis, brucellosis, tuberculosis, *Mycobacterium*, disease control.

Ramakrishnan, L.; Federspiel, N.A.; Falkow, S. **Granuloma-specific expression of *Mycobacterium* virulence proteins from the glycine-rich PE-PGRS family.** *Science*. 2000, 288 (5470) 1436-1439. ISSN: 0036-8075.

**NAL Call Number:** 470 SCI2

**Descriptors:** *Mycobacterium marinum*, *Mycobacterium tuberculosis*, macrophage replication, virulence gene factor expression, PE-PGRS gene, host granulomas, glycine-rich proteins, 2 deficient mutants, incapable of replication in macrophages, decreased persistence in lesions.

Rishendra, Verma; Verma, R.; Verma, R. (ed.); Sharma, N. (ed.); Varma, T.K. (ed.); Bagherwal, R.K. (ed.); Jaiswal, T.N. **TB: global emergency. Can man be infected with bovine TB?** *Advancements in Veterinary Science*. Indian Association for the Advancement of Veterinary Research, Bareilly, 2000. p. 55-62. Note: India Indian Veterinary Congress, Izatnagar, India, 18-19 February 2000.

**Descriptors:** humans, cattle, zoonotic potential, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, diagnosis, treatment, disease control, disease transmission.

Roring, S.; Hughes, M.S.; Skuce, R.A.; Neill, S.D. **Simultaneous detection and strain differentiation of *Mycobacterium bovis* directly from bovine tissue specimens by spoligotyping.** *Veterinary Microbiology*. 2000. 74 (3) 227-236.

**NAL Call Number:** SF601 V44

**Descriptors:** *Mycobacterium bovis*, bovine tuberculosis, rapid detection and strain typing, lesioned bovine lymph node specimens, PCR, spoligotyping, decontaminated and non-decontaminated lesioned lymph nodes, DNA, cattle.

Scanlon, M.P.; Quinn, P.J. **Inactivation of *Mycobacterium bovis* in cattle slurry by five volatile chemicals.** *Journal of Applied Microbiology*. 2000. 89 (5) 854-861.

**NAL Call Number:** QR1 J687

**Descriptors:** cattle slurry, *Mycobacterium bovis*, in vitro study, acetone, ammonium hydroxide, chloroform, ethyl alcohol, xylene, farm level use potential.

Sechi, L.A.; Dupre, I.; Leori, G.; Fadda, G.; Zanetti, S. **Distribution of a specific 500-base-pair fragment in *Mycobacterium bovis* isolates from Sardinian cattle.** *Journal of Clinical Microbiology*. 2000. 38 (10) 3837-3839.

**NAL Call Number:** QR46.J6

**Descriptors:** genetics, amplification of bacterial DNA, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, diagnosis, cattle, Italy, Sardinia, false negative results.

Torkko, P.; Suomalainen, S.; Iivanainen, E.; Suutari, M.; Tortoli, E.; Paulin, L.; Katila, M.L. ***Mycobacterium xenopi* and related organisms isolated from stream waters in Finland and description of *Mycobacterium botniense* sp. nov.** *International Journal of Systematic and Evolutionary Microbiology*. 2000, 50 (1) 283-289. ISSN: 1466-5026.

**NAL Call Number:** 442.8 IN82

**Descriptors:** *Mycobacterium*, scotochromogenic organisms, stream water isolates, GLC-MS, biochemical test, internal transcribed spacer sequencing, lipid analysis, unique sequences, characteristics of new species, strains (E347(T) and E43), ATCC strains 700701(T) and 700702.

Vilcheze, C.; Morbidoni, H.R.; Weisbrod, T.R.; Iwamoto, H.; Kuo, M.; Sacchettini, J.C.; Jacobs, W.R. Jr. **Inactivation of the inhA-encoded fatty acid synthase II (FASII) enoyl-acyl carrier protein reductase induces accumulation of the FASII end products and cell lysis of *Mycobacterium smegmatis*.** *Journal of Bacteriology*. 2000. 182 (14) 4059-4067.

**NAL Call Number:** 448.3 J82

**Descriptors:** lysis, *Mycobacterium bovis*, *Mycobacterium smegmatis*, *Mycobacterium tuberculosis*, fatty acid synthase, binding proteins, genes, isoniazid.

## 1999

Amadori, M.; Archetti, I.L.; Scaccaglia, P.; Modena, D.; Fossati, G.; Lucietto, P.; Mascagni, P. **Chaperonin 10 of *Mycobacterium tuberculosis***

**induces a protective immune response to foot-and-mouth disease virus.** *Archives of Virology*. 1999. 144 (5) 905-919. ISSN: 0304-8608

**NAL Call Number:** 448.3 Ar23

**Descriptors:** *Mycobacterium tuberculosis*, FMD, aphthovirus, antibody formation, antiviral properties, heat shock proteins, stress response.

Anonymymous. **Tuberculosis.** *Journal of Small Animal Practice*. March 1999. 40 (3) 145-147. ISSN: 0022-4510. Note: This article was prepared by the British Small Animal Veterinary Association's Scientific Committee.

**NAL Call Number:** 41.8 J8292

**Descriptors:** dogs, cats, man, *Mycobacterium tuberculosis*, pathogenesis, clinical aspects, diagnosis, zoonoses.

Aranaz, A.; Liebana, E.; Gomez-Mampaso, E.; Galan, J.C.; Cousins, D.; Ortega, A.; Blazquez, J.; Baquero, F.; Mateos, A.; Suarez, G.

***Mycobacterium tuberculosis* ssp. caprae ssp. nov.: a taxonomic study of a new member of the *Mycobacterium tuberculosis* complex isolated from goats in Spain.** *International Journal of Systematic Bacteriology*. July 1999. 49 (pt. 3) 1263-1273. ISSN: 0020-7713

**NAL Call Number:** 448.3 In8

**Descriptors:** new subspecies, taxonomy description, *Mycobacterium tuberculosis* ssp. caprae ssp. nov., Spain. *Molecular sequence data:* genbank/aj131120.

Bulling, E.; Schonberg, A. **Robert von Ostertag (1864-1940). A veterinarian contemporary with R. Virchow and R. Koch.** *Historia Medicinae Veterinariae*. 1999. 24 (4) 97-120. Note: In English with a German summary.

**NAL Call Number:** SF615 A1V4

**Descriptors:** veterinary history, biographical information, slaughter houses, abattoirs, meat hygiene, infectious diseases, meat inspection, meat products, pathology, slaughter, bovine tuberculosis and other zoonotic diseases, veterinary contributions.

Costello, E.; O'Grady, D.; Flynn, O.; O'Brien, R.; Rogers, M.; Quigley, F.; Egan, J.; Griffin, J. **Study of restriction fragment length polymorphism analysis and spoligotyping for epidemiological investigation of *Mycobacterium bovis* infection.** *Journal of Clinical Microbiology*. 1999. 37 (10) 3217-3222.

**NAL Call Number:** QR46.J6

**Descriptors:** RFLP analysis, strain typing, *Mycobacterium bovis*, IS 6110, direct repeat sequence, polymorphic GC-rich sequence, spoligotyping, DNA fingerprinting, 452 isolates, cattle, badger, deer, pigs, sheep, goat, indicators of infection transmission between species, Irish Republic.

de Lisle, G.W.; Wilson, T.; Collins, D.M.; Buddle, B.M. **Vaccination of guinea pigs with nutritionally impaired avirulent mutants of *Mycobacterium bovis* protects against tuberculosis.** *Infection and Immunity*. May 1999. 67 (5) 2624-2626. ISSN: 0019-9567

**NAL Call Number:** QR1.I57

**Abstract:** Four nutritionally impaired strains of *Mycobacterium bovis* produced by illegitimate recombination were tested for their ability to protect guinea pigs against intratracheal challenge with virulent *M. bovis*. All four strains and *M. bovis* BCG induced significant levels of protection as measured by the reduced spread of infection to the spleen and liver. In animals vaccinated with BCG or two of the other strains, the bacterial counts from the lungs were significantly lower than those of the nonvaccinated animals.

**Descriptors:** intratracheal challenge, virulent strain challenge, 4 strains, levels of protection, bacterial count, lungs.

Erler, W.; Schimmel, D.; Feist, H.; Geschwend, G. **Zur Differenzierung von Mykobakterien.** [Studies on the differentiation of mycobacteria.] *Tierärztliche Umschau*. 1999. 54 (10) 579-582. Note: In German with an English summary.

**NAL Call Number:** 41.8 T445

**Descriptors:** National Veterinary Reference Laboratory for Tuberculosis, differentiation, microbial, biochemical and molecular biological methods, research studies completed, *Mycobacterium*, Germany.

Flesselles, B.; Anand, N.N.; Remani, J.; Loosmore, S.M.; Klein, M.H. **Disruption of the mycobacterial cell entry gene of *Mycobacterium bovis* BCG results in a mutant that exhibits a reduced invasiveness for epithelial cells.** *FEMS Microbiology Letters*. Aug 15, 1999. 177 (2) 237-242. ISSN: 0378-1097

**NAL Call Number:** QR1.F44

**Abstract:** Mycobacteria belonging to the *Mycobacterium tuberculosis* complex have the ability to invade and replicate in nonphagocytic cells, an event that requires the presence of bacterial surface components capable of triggering a cell response and the subsequent internalization of the microorganism. In this study, we report the sequencing of the mycobacterial cell entry gene (mce) of *Mycobacterium bovis* bacillus Calmette-Guerin (BCG) and the generation and characterization of a mutant BCG strain with an inactivated mce gene, by homologous recombination with double cross-over. This mutant strain does not express the mycobacterial cell entry protein (Mce) and exhibits a reduced ability to invade the non-phagocytic epithelial cell line HeLa as compared to wild-type BCG.

**Descriptors:** *Mycobacterium bovis* BCG strain, cell invasion. *Molecular sequence data:* genbank/af113402.

Gormley, E.; Fray, L.; Sandall, L.; Ke, GenPing; Dupont, C.; Carpenter, E. **Detection of *Mycobacterium bovis* lymphocyte stimulating antigens in culture filtrates of a recombinant *Mycobacterium smegmatis* cosmid library.** *Vaccine*. 1999. 17 (22) 2792-2801.

**NAL Call Number:** QR189 V32

**Descriptors:** *Mycobacterium bovis*, cultural filtrates, cosmid library, *Mycobacterium smegmatis*, lymphocyte stimulatory antigens, mononuclear cells from vaccinated cattle, *Mycobacterium bovis* BCG, IFN-gamma production, cellular response, antigen detection assay, heterogeneity.

Kouba, V. **Historie eliminace bovinni tuberkulozy v Ceske Republice.** [History of the eradication of bovine tuberculosis in the Czech Republic.] *Casopis Lekarů Ceskyh*. 1999. 138 (15) 456-459. Note: In Czech with an English summary.

**Descriptors:** *Mycobacterium bovis*, eradication, history, disease control, cattle, humans, slaughter, Czech Republic.

Montgomery, R.H. **Mycobacteria in New Zealand.** *Surveillance*. 1999. 26 (1) 6-8; 18.

**NAL Call Number:** SF604.63 N45S87

**Descriptors:** birds, possums, dogs, cats, rabbits, pigs, sheep, goats, deer, cattle, humans, *Mycobacterium* taxonomy, diagnosis, disease transmission, disease prevalence, disease control, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, Erinaceidae, *Mustela erminea*, *Mycobacterium avium*,

*Mycobacterium paratuberculosis*, *Mycobacterium lepraemurium*, *Mycobacterium marinum*, *Mycobacterium kansasii*, New Zealand.

Nelson, A.M. **The cost of disease eradication: smallpox and bovine tuberculosis.** *Annals of the New York Academy of Sciences*. 1999. 894: 83-91. "Food and agricultural security guarding against natural threats and terrorist attacks affecting health, national food supplies, and agricultural economics." Note: Paper presented at the "International conference on food and agricultural security," September 28-30, 1998, Washington, D.C. ISBN: 1573312304.

**NAL Call Number:** 500 N484 v. 894

**Descriptors:** disease control and eradication, smallpox, cattle diseases, tuberculosis, health care costs, disease prevention, zoonotic disease threat, economic impacts, *Mycobacterium bovis*.

Pavlas, M. **The 30th anniversary of eradication of bovine tuberculosis in cattle in Czechoslovakia.** *Acta Veterinaria Brno*. 1999. 68 (2) 155-162. Note: In English with a Czech summary.

**NAL Call Number:** SF604 B7

**Descriptors:** *Mycobacterium tuberculosis*, cattle, humans, reviews, disease prevalence, control programs, disease control, culling of diseased animals, epidemiology, public health concerns.

Pereira, J.J.; Garbaccio, S.G. **Tuberculosis bovina. El veterinario y una enfermedad tan vieja como el mundo. [Bovine tuberculosis. The veterinarian and a disease as old as the world.]** *Revista de Medicina Veterinaria, Buenos Aires*. 1999. 80 (4) 328-329. Note: In Spanish.

**NAL Call Number:** 41.8 B86

**Descriptors:** cattle, tuberculosis, *Mycobacterium*, epidemiology, veterinarians.

Rauzier, J.; Gormley, E.; Gutierrez, M.C.; Kassa-Kelembho, E.; Sandall, L.J.; Dupont, C.; Gicquel, B.; Murray, A. **A novel polymorphic genetic locus in members of the *Mycobacterium tuberculosis* complex.** *Microbiology*. 1999. 145 (7) 1695-1701.

**NAL Call Number:** QR1J64

**Descriptors:** *Mycobacterium tuberculosis*, cattle, *Mycobacterium bovis*, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium bovis* BCG, *Mycobacterium africanum*, *Mycobacterium microtum*, *Mycobacterium paratuberculosis*, polymorphism, tuberculosis, DNA probes, genetic markers, promoters, restriction fragment length polymorphism, RFLP, strain differences, transposable elements, gene loci.

Reynolds, D. **TB in cattle: the government's commitment to controlling the disease.** *Cattle Practice*. 1999. 7 (4) 371.

**NAL Call Number:** SF961 C37

**Descriptors:** tuberculosis, legislation, zoonoses, slaughter, diagnosis, disease transmission, disease control, cattle, *Mycobacterium tuberculosis*, wild badgers, *Meles meles*, UK.

Reynolds, R.C.; Bansal, N.; Rose, J.; Friedrich, J.; Suling, W.J.; Maddry, J.A. **Ethambutol-sugar hybrids as potential inhibitors of mycobacterial cell-wall biosynthesis.** *Carbohydrate Research*. Apr 30, 1999. 317 (1/4) 164-179. ISSN: 0008-6215

**NAL Call Number:** 385 C172

**Abstract:** Ethambutol is an established front-line agent for the treatment of tuberculosis, and is also active against *Mycobacterium avium* infection. However, this agent exhibits toxicity, and is considered to have low potency. The action of ethambutol on the mycobacterial cell wall, particularly the arabinan, and comparison of the structure of ethambutol with several of the cell-wall saccharides, suggested that ethambutol-saccharide hybrids might lead to agents with a more selective mechanism of action. To this end, eight ethambutol-saccharide hybrids were synthesized and screened against *M. tuberculosis* and several clinical isolates of *M. avium*.

**Descriptors:** *Mycobacterium tuberculosis*, *M. avium*, effectiveness, toxicity, glycosyltransferases.

Rodriguez, J.G.; Fissanoti, J.C.; del Portillo, P.; Patarroyo, M.E.; Romano, M.I.; Cataldi, A. **Amplification of a 500-base-pair fragment from cultured isolates of *Mycobacterium bovis*.** *Journal of Clinical Microbiology*. 1999. 37 (7) 2330-2332.

**NAL Call Number:** QR46 J6

**Descriptors:** amplification, 500 bp DNA fragment, *Mycobacterium bovis*, 121 isolates, potential as a diagnostic assay, polymorphism, PCR, DNA probes, nucleotide sequences, cattle, sea lions, Argentina, Colombia, Mexico.

Romero, R.E.; Garzon, D.L.; Mejia, G.A.; Monroy, W.; Patarroyo, M.E.; Murillo, L.A. **Identification of *Mycobacterium bovis* in bovine clinical samples by PCR species-specific primers.** *Canadian Journal of Veterinary Research*. Apr 1999. 63 (2) 101-106. ISSN: 0830-9000. Note: In English with a French summary.

**NAL Call Number:** SF601.C24

**Descriptors:** dairy cows, *Mycobacterium bovis*, rapid methods, polymerase chain reaction, PCR, southern blotting, blood, mucus, milk, skin tests, disease surveys, tuberculosis, cross reaction, dot blotting, Colombia.

Romero, R.E.; Garzon, D.L.; Mejia, G.A.; Monroy, W.; Patarroyo, M.E.; Murillo, L.A. **Identification of *Mycobacterium bovis* in bovine clinical samples by PCR species-specific primers.** *Canadian Journal of Veterinary Research*. 1999. 63 (2) 101-106.

**NAL Call Number:** SF601.C24

**Descriptors:** dairy cattle, *Mycobacterium bovis*, tuberculosis, diagnosis, PCR, polymerase chain reaction, diagnostic techniques, 470 bp fragment, intradermal tuberculin test, nasal mucus sampling, PCR more specific and sensitive diagnosis.

Roxo, E. **Importancia da medicina veterinaria nos programas de combate a tuberculose. [Importance of veterinary medicine in programs for combating tuberculosis.]** *O Biologico*. 1999. 61 (2) 143-144. Note: In Portuguese.

**Descriptors:** disease control, tuberculosis, *Mycobacterium*, zoonoses.

Sakamoto, S.M.; Heinemann, M.B.; Telles, M.A.S.; Roxo, E.; Richtzenhain, L.J.; Vasconcellos, S.A.; Ferreira-Neto, J.S. **Deteccao e identificacao de *Mycobacterium bovis* pela reacao em cadeia da polimerase (PCR). [Detection and identification of *Mycobacterium bovis* using polymerase chain reaction (PCR).]** *Arquivos do Instituto Biologico, Sao Paulo*. 1999. 66 (2) 45-58. Note: In Portuguese with an English summary.

**NAL Call Number:** 442.9 SA6

**Descriptors:** *Mycobacterium bovis*, PCR, detection, identification techniques.

Santillan-Flores, M.A.; Sanchez-Zamorano, L.M.; Milian-Suazo, F.; Ramirez Casillas, I.C. **Viabilidad de *Mycobacterium bovis* en solucion de tetraborato de sodio. [Viability of *Mycobacterium bovis* in a sodium tetraborate solution.]** *Tecnica Pecuaria en Mexico*. 1999. 37 (1) 71-74.

Note: In Spanish with an English summary.

**NAL Call Number:** 49 T222

**Descriptors:** cattle, *Mycobacterium bovis*, lymph nodes, sodium tetraborate storage, various storage periods, culturing, bacteria viability over time, tissue preservation, diagnostic method.

Sutmoller, P. **Risk of disease transmission by llama embryos.** *Revue Scientifique et Technique Office International des Epizooties*. 1999. 18 (3) 719-728. Note: In English with French and Spanish summaries.

**NAL Call Number:** SF781 R4

**Descriptors:** disease transmission risks, embryos, brucellosis, contamination, embryo transfer, FMD, risk assessment, tuberculosis, zona pellucida, arboviruses, bacterial diseases, viral diseases, Bluetongue virus, *Brucella*, *Mycobacterium*, vesicular stomatitis virus, llamas.

Tanner, M; Michel, A.L. **Investigation of the viability of *M. bovis* under different environmental conditions in the Kruger National Park.** *Onderstepoort Journal of Veterinary Research*. 1999. 66 (3) 185-190.

**NAL Call Number:** 41.8 On1

**Descriptors:** environment, wildlife, African buffalo, Kruger National Park, feces, lungs, lymph nodes, wild animals, viability, survival, habitats, seasons, bacterial diseases, *Syncerus caffer*, *Mycobacterium bovis*, seasonal effects, South Africa.

Wiker, H.G.; Michell, S.L.; Hewinson, R.G.; Spierings, E.; Nagai, S.; Harboe, M. **Cloning, expression and significance of MPT53 for identification of secreted proteins of *Mycobacterium tuberculosis*.** *Microbial Pathogenesis*. 1999. 26 (4) 207-219.

**NAL Call Number:** QR175 M53

**Descriptors:** cattle, *Mycobacterium tuberculosis*, antigens, excretory-secretory products, amino acid sequences, amino acids, characterization, gene expression, immune response, antibodies, IgM, IgG1 anti-MPT53, cattle sera.

Vordermeier, H.M.; Cockle, P.C.; Whelan, A.; Rhodes, S.; Palmer, N.; Bakker, D.; Hewinson, R.G. **Development of diagnostic reagents to differentiate between *Mycobacterium bovis* BCG vaccination and *M. bovis* infection in cattle.** *Clinical and Diagnostic Laboratory Immunology*. 1999. 6 (5) 675-682.

**Descriptors:** recombinant forms of antigens, BCG Pasteur (ESAT-6, MPB64, MPB70, MPB83), testing, *Mycobacterium bovis*, calf mononuclear cells, sensitized animals, *M. bovis* infected, BCG vaccinated, *M. avium* sensitized, in vitro proliferation and gamma interferon responses, peptide and protein cocktails formulations, T cell epitopes.

Zumarraga, M.; Bigi, F.; Alito, A.; Romano, M.I.; Cataldi, A. **A 12.7 kb fragment of the *Mycobacterium tuberculosis* genome is not present in *Mycobacterium bovis*.** *Microbiology*. Apr 1999. 145 (pt. 4) 893-897. ISSN: 1350-0872

**NAL Call Number:** QR1J64

**Abstract:** Southern blotting, sequence analysis and PCR experiments showed that *Mycobacterium bovis* and *Mycobacterium bovis* BCG lack a 12(.7) kb fragment present in the genome of *Mycobacterium tuberculosis*. This region is 337 bp downstream of the RD2 region, which was previously described as being absent from some *M. bovis* BCG strains. The 12(.7) kb fragment should be useful as a target for a PCR test to differentiate *M. tuberculosis* and *M. bovis*. An analysis of the 12(.7) kb region suggests that it represents a deletion in *M. bovis* rather than an insertion in *M. tuberculosis*. The deletion removes most of the mce-3 operon, one of four highly related operons which may be involved in cell entry, and therefore it may contribute to differences in virulence or host range in the two species.

**Descriptors:** genetics, strain differences, RD2 region, Southern blotting, PRC, differentiate strains, *Mycobacterium bovis*, *Mycobacterium bovis* BCG, *Mycobacterium tuberculosis*. *Molecular sequence data:* genbank/al022073.

## 1998

Ballarini, G. **Tubercolosi e micobatteriosi: ieri, oggi e domani. [Tuberculosis and mycobacterial infections: yesterday, today and tomorrow.]** *Obiettivi e Documenti Veterinari*. 1998. 19 (7-8) 35-42. Note: In Italian.

**Descriptors:** cattle, pigs, humans, veterinary history, epidemiology, tuberculosis, *Mycobacterium*, cattle diseases, swine diseases.

Clifton-Hadley, R.S.; Inwald, J.; Archer, J.; Hughes, S.; Palmer, N.; Sayers, A.R.; Sweeney, K.; Van Embden, J.D.A.; Hewinson, R.G. **Recent advances in DNA fingerprinting using spoligotyping - epidemiological applications in bovine TB.** *Cattle Practice*. 1998. 6 (2) 79-82.

**NAL Call Number:** SF961 C37

**Descriptors:** 2668 *Mycobacterium bovis* isolates, cattle, badgers, other species, spoligotyping, epidemiology, DNA fingerprinting, UK.

Cornejo, B.J.; Sahagun-Ruiz, A.; Suarez-Guemes, F.; Thornton, C.G.; Ficht, T.A.; Adams, L.G. **Comparison of C18-carboxypropylbetaine and glass bead DNA extraction methods for the detection of *Mycobacterium bovis* in bovine milk samples and analysis of samples by PCR.** *Applied and Environmental Microbiology*. Aug 1998. 64 (8) 3099-3101. ISSN: 0099-2240

**NAL Call Number:** 448.3 Ap5

**Abstract:** The purpose of this prospective study was to compare two different milk preparation methods to assay for the presence of *Mycobacterium bovis* by PCR. Detection by a C18-carboxypropylbetaine (CB-18)-based sample processing method was compared to extraction of DNA from milk with glass beads. Samples from 17 skin test-positive cattle were analyzed. Following CB-18 processing and glass bead extraction, the sensitivity of IS6110-based PCR was 94.1 and 58.8%, respectively (P < 0.025). Because CB-18 processing will permit the proficient use of PCR for diagnosis and surveillance of bovine tuberculosis, it will contribute to the more efficient detection and control of tuberculosis.

**Descriptors:** polymerase chain reaction, detection methods, milk, *Mycobacterium bovis*, surveillance.

Cousins, D.; Williams, S.; Liebana, E.; Aranaz, A.; Bunschoten, A.; van Embden, J.; Ellis, T. **Evaluation of four DNA typing techniques in epidemiological investigations of bovine tuberculosis.** *Journal of Clinical Microbiology*. Jan 1998. 36 (1) 168-178. ISSN: 0095-1137

**NAL Call Number:** QR46.J6

**Descriptors:** *Mycobacterium bovis*, DNA typing techniques, comparative study, effectiveness.

Cousins, D.V.; Skuce, R.A.; Kazwala, R.R.; Van Embden, J.D.A. **Towards a standardized approach to DNA fingerprinting of *Mycobacterium bovis*.** *International Journal of Tuberculosis and Lung Disease*. 1998. 2 (6) 471-478.

**Descriptors:** DNA strain typing standards, *Mycobacterium bovis*, RFLP, recommendations.

Dechering, K.J.; Cuelenaere, K.; Konings, R.N.H.; Leunissen, J.A.M. **Distinct frequency-distributions of homopolymeric DNA tracts in different genomes.** *Nucleic Acids Research*. Sept 1, 1998. 26 (17) 4056-4062. ISSN: 0305-1048

**NAL Call Number:** QD341.A2N8

**Descriptors:** *Arabidopsis thaliana*, *Saccharomyces cerevisiae*, man, *Plasmodium falciparum*, *Escherichia coli*, *Caenorhabditis elegans*, *Mycobacterium tuberculosis*, DNA, genomes, nucleosides, species differences, chemical composition, base composition.

Elleingand, E.; Gerez, C.; Un, S.; Knupling, M.; Lu, G.; Salem, J.; Rubin, H.; Sauge-Merle, S.; Laulhere, J.P.; Fontecave, M. **Reactivity studies of the tyrosyl radical in ribonucleotide reductase from *Mycobacterium tuberculosis* and *Arabidopsis thaliana*: comparison with *Escherichia coli* and mouse.** *European Journal of Biochemistry*. Dec 1998. 258 (2) 485-490. ISSN: 0014-2956

**NAL Call Number:** QP501.E8

**Descriptors:** tuberculosis, *Mycobacterium tuberculosis*, *Arabidopsis thaliana*, enzyme physiology, comparison study, ribonucleotide reductase.

Espinosa De Los Monteros, L.E.; Galan, J.C.; Gutierrez, M.; Samper, S.; Garcia-Marin, J.F.; Martin, C.; Dominguez, L.; de Rafael, L.; Baquero, F.; Gomez-Mampaso, E. **Allele-specific PCR method based on *pncA* and *oxyR* sequences for distinguishing *Mycobacterium bovis* from *Mycobacterium tuberculosis*: intraspecific *M. bovis pncA* sequence polymorphism.** [Erratum: Aug 1998. 36 (8), p. 2398.] *Journal of Clinical Microbiology*. Jan 1998. 36 (1) 239-242. ISSN: 0095-1137

**NAL Call Number:** QR46.J6

**Descriptors:** pathogenic strain differentiation, *Mycobacterium bovis* from *Mycobacterium tuberculosis*, *pncA* and *oxyR* sequences, sequence polymorphism.

Ficht, T.A.; Whipple, D.; Perumaalla, V.; Chacon, O.; Alford, P.; Slater, M.; Baca, D.; Hernandez, J.; Payeur, J.; Jarnagin, J.; Suarez, F.; Turcotte, C.; Rohonczy, E.; Adams, L.G.; Williams, E.I. **Molecular epidemiologic and geographic information system analyses of *Mycobacterium bovis* isolates from North America.** *Proceedings of the Thirty-First Annual Conference American Association of Bovine Practitioners, Spokane, Washington, USA, 24-26 September, 1998*. 1998. p. 279-281. American Association of Bovine Practitioners; Stillwater; USA

**NAL Call Number:** SF961 A5

**Descriptors:** cattle, deer, *Mycobacterium bovis*, epidemiology, tuberculosis, DNA fingerprinting, RFLP, restriction fragment length polymorphism, isolates, epidemiology, geographical information, North America.

Fisanotti, J.C.; Alito, A.; Bigi, F.; Latini, O.; Roxo, E.; Cicuta, E.; Zumarraga, M.J.; Cataldi, A.; Romano, M.I. **Molecular epidemiology of *Mycobacterium bovis* isolates from South America.** *Veterinary Microbiology*. 1998. 60 (2/4) 251-257.

**NAL Call Number:** SF601 V44

**Descriptors:** cattle, DNA fingerprinting, 178 isolates, useful for epidemiological studies, tuberculosis, bacterial diseases, *Mycobacterium bovis*, Argentina, Paraguay, Mexico, Costa Rica, Brazil.

Fischer, N.H.; Lu, T.; Cantrell, C.L.; Castaneda-Acosta, J.; Quijano, L.; Franzblau, S.G. **Antimycobacterial evaluation of germacranolides.** *Phytochemistry*. Sept 1998. 49 (2) 559-564. ISSN: 0031-9422

**NAL Call Number:** 450 P5622

**Abstract:** The minimum inhibitory concentrations (MIC) against *Mycobacterium tuberculosis* and *M. avium* of parthenolide, costunolide, 1 (10)-epoxycostunolide and other germacranolide-type sesquiterpene lactones and derivatives were determined by use of a radiorespirometric bioassay. Structure-activity relationship studies with natural and semisynthetic sesquiterpene lactones suggested that the alpha-methylene-gamma-lactone moiety is an essential, but not sufficient, structural requirement for significant in vitro activity against *M. tuberculosis* and *M. avium*.

**Descriptors:** *Mycobacterium avium*, *Mycobacterium tuberculosis*, phytosterols, sesquiterpenoid lactones, antibacterial properties, derivatives, bioassays, structure activity relationships, chemical structure, biochemical pathways.

Gallagher, J.; Jenkins, P.A.; Palmer, S.R. (ed.); Soulsby, Lord (ed.); Simpson, D.I.H. **Mycobacterial diseases.** *Zoonoses: Biology, Clinical Practice and Public Health Control*. Oxford, Oxford University Press. 1998. p. 155-164.

**NAL Call Number:** RC113.5 Z673 1998

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium avium*, *Mycobacterium avium* complex, *Mycobacterium tuberculosis*, zoonotic diseases, epidemiology, disease prevention and control, treatment.

Gonzalez-Salazar, D.; Valero-Elizondo, G.; Monroy-Basilio, J.I.; Cordova-Lopez, D. **Comparacion entre tinciones especiales para bacterias acido-resistentes en cortes histologicos. [Comparison of stains for acid-fast bacteria for histological sections.]** *Tecnica Pecuaria en Mexico*. 1998. 36 (1) 89-94. Note: In Spanish with an English summary.

**NAL Call Number:** 49 T222

**Descriptors:** stains, staining, *Mycobacterium bovis*, cattle, tuberculosis, diagnosis, acid-fast bacteria, comparison study.

Hamid, M.E.; Ridell, M.; Minnikin, D.E.; Goodfellow, M. **Serotaxonomic analysis of glycolipids from *Mycobacterium chelonae*-*M. fortuitum* complex and bovine farcy strains.** *Zentralblatt fur Bakteriologie*. 1998. 288 (1) 23-34.

**NAL Call Number:** QR1 Z443

**Descriptors:** cattle, humans, glycolipids, *Mycobacterium* strains, characterization, taxonomy, antigens, bacterial diseases, *Mycobacterium chelonae*, *Mycobacterium fortuitum*, *Mycobacterium farcinogenes*, *Mycobacterium senegalense*.

Joardar, S.N.; Ram, G.C.; Srivastava, S.K.; Joshi, P.; Bansal, M.P. **Seroreactivity of *Mycobacterium bovis* AN5 culture filtrate antigens.** *Indian*

*Journal of Comparative Microbiology, Immunology and Infectious Diseases*. 1998. 19 (1) 35-39.

**Descriptors:** *Mycobacterium bovis*, cattle, immunological factors, antigens, bacterial antigens, diagnostic techniques, ELISA, tuberculosis, bacterial proteins, immunodiagnosis, diagnosis.

Majoros, T.; Cseh, K.; Guzsany, M. **A fureszpor szerepe a szarvasmarhak mycobacteriosisaban. [Role of sawdust in mycobacteriosis in cattle.]** *Magyar Allatorvosok Lapja*. 1998. 120 (9) 535-538. Note: In Hungarian with an English summary.

**NAL Call Number:** 41.8 V644

**Descriptors:** cattle, *Mycobacterium gordonae*, diagnosis, tuberculosis, sawdust, tuberculin skin tests, false positive results, sawdust litter/bedding, Hungary.

Ocepek, M.; Posedi, J. **Evaluation of gen-probe amplified *Mycobacterium tuberculosis* direct test and AccuProbe culture identification test in diagnostic of animal tuberculosis.** *Zbornik Veterinarske Fakultete Univerza Ljubljana*. 1998. 35 (1-2) 35-41. Note: In English with a Slovenian summary.

**NAL Call Number:** SF604 L52

**Descriptors:** *Mycobacterium tuberculosis*, *Mycobacterium avium*, *Mycobacterium bovis*, accuracy of diagnostic techniques, efficacy of nucleic acid hybridization test identification, MTD test, domestic animal tuberculosis.

Pavlik, I. **Bovinni tuberkuloza zvirat a lidi v Africe. [Bovine tuberculosis in animals and people in Africa.]** *Veterinarstvi*. 1998. 48 (7) 312-314. Note: In Czech.

**NAL Call Number:** 41.8 V6439

**Descriptors:** animals, humans, *Mycobacterium bovis*, reviews, tuberculosis, Africa.

Roring, S.; Hughes, M.S.; Beck, L.A.; Skuce, R.A.; Neill, S.D. **Rapid diagnosis and strain differentiation of *Mycobacterium bovis* in radiometric culture by spoligotyping.** *Veterinary Microbiology*. 1998. 61 (1/2) 71-80.

**NAL Call Number:** SF601 V44

**Descriptors:** *Mycobacterium bovis*, cattle, spoligotyping, BACTEC 12B broth cultures, bovine lymph node tissue, 7 types, ST1, ST2, ST14, ST21, ST25, diagnosis and detection, Northern Ireland.

Tameni, S.; Amadori, M.; Scaccaglia, P.; Quondam-Giandomenico, R.; Tagliabue, S.; Archetti, I.L.; Adone, R.; Ciuchini, F. **Quality controls and in vitro diagnostic efficiency of bovine PPD tuberculins.** *Biologicals*. 1998. 26 (3) 225-235.

**NAL Call Number:** QH301 J68

**Descriptors:** cattle, *Mycobacterium bovis*, quality controls, tuberculin, diagnosis, tuberculosis, antigens.

Tizard, M.; Bull, T.; Millar, D.; Doran, T.; Martin, H.; Sumar, N.; Ford, J.; Hermon-Taylor, J. **A low G+C content genetic island in *Mycobacterium avium* subsp. *paratuberculosis* and *M. avium* subsp. *silvaticum* with homologous genes in *Mycobacterium tuberculosis*.** *Microbiology*. Dec 1998. 144 (pt. 12) 3413-3423. ISSN: 1350-0872

**NAL Call Number:** QR1.J64

**Abstract:** The technique of representation difference analysis PCR has been applied to find genes specific to *Mycobacterium avium* ssp. *paratuberculosis*. This generated a 671 bp fragment which was used to isolate a larger genetic element found in the enteric pathogens *M. avium* ssp. *paratuberculosis* and *M. avium* ssp. *silvaticum* but which was absent from the very closely related and relatively benign *M. avium* subsp. *avium*. This element, designated GS, is greater than 6(.)5 kbp in length and has a G+C content 9 mol% lower than other genes from this species. There is a previously uncharacterized insertion sequence associated with one end. The GS element encodes five ORFs in *M. avium* ssp. *paratuberculosis* and *M. avium* ssp. *silvaticum*, all of which have counterparts encoded in *Mycobacterium tuberculosis*. Database searches revealed homologues for these ORFs in a number of bacterial species, predominantly Gram-negative organisms, including a number of enteric pathogens. These homologous genes encode functions related to LPS or extracellular polysaccharide biosynthesis. This element has a number of features in common with pathogenicity islands such as its low G+C content, an association with a putative insertion sequence and a grouping of genes of related function with a possible link to virulence. No direct link to pathogenicity has been shown but GS may belong to a group of related 'genetic islands' and represents the first such element to be identified in mycobacteria.

**Descriptors:** *Mycobacterium avium* ssp. *silvaticum*, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium tuberculosis*. *Molecular sequence data:* genbank/aj223832, genbank/aj223833

UK, State Veterinary Service. **Focus on aspects of tuberculosis research.** *State Veterinary Journal*. 1998. 8 (3) 3-4.

**NAL Call Number:** SF601 S8

**Descriptors:** cattle, *Mycobacterium bovis*, DNA fingerprinting, tuberculosis, research, vaccine development, diagnostic techniques, UK.

United States Animal Health Association. *Proceedings: One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October, 1998*. Richmond: The Association. 1998. 756 pp.

**NAL Call Number:** 49.9 UN3R

**Descriptors:** livestock, pigs, cattle, bison, horses, llamas, poultry, aquaculture species, wildlife, animal welfare, biotechnology, disease outbreaks, feeds, food safety, international trade, parasitoses, drugs, environment, rabies, bluetongue virus, Retroviridae, *Leptospira*, Aujeszky virus, *Salmonella*, *Mycobacterium bovis*, *Mycobacterium avium* ssp. *paratuberculosis*, USA.

Wang, Z.G. **Isolation and identification of atypical mycobacteria from cattle.** *Journal of Jilin Agricultural University*. 1998. 20 (2) 73-77. Note: In Chinese with an English summary.

**Descriptors:** atypical strain, cattle, lymph nodes, post slaughter tissue harvesting, *Mycobacterium scrofulaceum*, *Mycobacterium fortuitum*, *Mycobacterium avium* intracellulare complex, *Mycobacterium paratuberculosis*, *Mycobacterium flavescens*, an unknown rapid grower, China.

Wren, B.W.; Stabler, R.S.; Das, S.S.; Butcher, P.D.; Mangan, J.A.; Clarke, J.D.; Casali, N.; Parish, T.; Stoker, N.G. **Characterization of a haemolysin from *Mycobacterium tuberculosis* with homology to a virulence factor of *Serpulina hyodysenteriae*.** *Microbiology*. May 1998. 144 (pt. 5) 1205-1211. ISSN: 1350-0872

**NAL Call Number:** QR1.J64

**Abstract:** Scrutiny of sequence data from the *Mycobacterium leprae* genome sequencing project identified the presence of a gene encoding a 268-amino-acid polypeptide which is highly similar to a pore-forming haemolysin/cytotoxin virulence determinant, TlyA, from the swine pathogen *Serpulina hyodysenteriae*. Using degenerate oligonucleotide primers based on the TlyA sequences, the *Mycobacterium tuberculosis* homologue was amplified and this product was used to obtain the clone and sequence a 2.5 kb fragment containing the whole *M. tuberculosis* tlyA gene. tlyA encodes a 267-amino-acid protein with a predicted molecular mass of 28 kDa. TlyA homologues were identified by PCR in *M. leprae*, *Mycobacterium avium* and *Mycobacterium bovis* BCG, but appeared absent in *Mycobacterium smegmatis*, *Mycobacterium vaccae*, *Mycobacterium kansasii*, *Mycobacterium chelonae* and *Mycobacterium phlei*. The *M. tuberculosis* gene appeared to be the first gene in an operon containing at least two other genes. Introduction of the *M. tuberculosis* tlyA gene into *M. smegmatis* using a mycobacterial shuttle expression plasmid converted non-haemolytic cells into those exhibiting significant haemolytic activity. Similarly, inducible haemolytic activity was observed in sonicated bacteria when tlyA was expressed as a His6-tagged fusion protein in *Escherichia coli*. tlyA mRNA was detected in both *M. tuberculosis* and *M. bovis* BCG using RT-PCR, confirming that this gene is expressed in organisms cultured in vitro.

**Descriptors:** virulence facts, tlyA homologues, PCR, *Mycobacterium leprae*, *Mycobacterium avium*, *Mycobacterium bovis* BCG, *Mycobacterium smegmatis*, *Mycobacterium vaccae*, *Mycobacterium kansasii*, *Mycobacterium chelonae*, *Mycobacterium phlei*. *Molecular sequence data:* genbank/x98295.

Yao, J.Z.; Xu, C.B.; Jin, F.S.; Feng, S.Z.; Zhu, P. **Nucleotide sequence analysis of the hsp 70 gene promoter of *Mycobacterium tuberculosis*.** *Chinese Journal of Veterinary Science*. 1998. 18 (6) 562.

**NAL Call Number:** SF604 C58

**Descriptors:** *Mycobacterium tuberculosis*, genes, nucleotide sequences.

Yearsley, D.; O'Rourke, J.; O'Brien, T.; Egan, J. **Comparison of three methods for the isolation of mycobacteria from bovine tissue lesions.** *Veterinary Record*. 1998. 143 (17) 480-481. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, lymph nodes, *Mycobacterium tuberculosis*, isolation techniques, rapid methods, culture media, cell culture.

## 1997

Bigi, F.; Espitia, C.; Alito, A.; Zumarraga, M.; Romano, M.I.; Cravero, S.; Cataldi, A. **A novel 27 kDa lipoprotein antigen from *Mycobacterium bovis*.** *Microbiology*. Nov 1997. 143 (pt. 11) 3599-3605. ISSN: 1350-0872

**NAL Call Number:** QR1.J64

**Abstract:** A novel *Mycobacterium bovis* antigen was identified from an expression library using sera from naturally infected cattle. The *Escherichia coli* recombinant clone expressed a 27 kDa protein, named P27. A rabbit serum against the recombinant antigen recognized a protein of 27 kDa in cellular extracts from *M. bovis* and *M. tuberculosis*. No protein was recognized in the culture supernatant. Sequence analysis indicated that P27 has a molecular mass of 24 kDa, showing a characteristic signal sequence for lipoprotein modification (a signal peptidase type II site). The gene is identical to a gene identified in the *M. tuberculosis* genome sequencing project. Cellular fractionation experiments suggested that P27 is an integral membrane protein. The antigen was recognized by individual sera and peripheral blood mononuclear cells (PBMC) from diseased cattle. PCR experiments with specific primers directed to the P27 structural gene indicated that it is only present in the *M. tuberculosis* species complex. In conclusion, a novel immunogenic lipoprotein in *M. bovis*/*M. tuberculosis* has been identified. The results presented here and elsewhere suggest that mycobacterial lipoproteins should be considered in the design of new recombinant vaccines and diagnostic methods.

**Descriptors:** cattle, nucleotide sequences, amino acid sequences, *Mycobacterium bovis*, *Mycobacterium tuberculosis*. *Molecular sequence data:* genbank/aj000500.

Ficht, T.A.; Whipple, D.; Perumaalla, V.; Chacon, O.; Alford, P.; Slater, M.; Baca, D.; Hernandez, J.; Payeur, J.; Jarnagin, J.; Suarez, F.; Turcotte, C.; Rohonczy, E.; Adams, L.G. **Molecular epidemiologic and geographic information system analyses of *Mycobacterium bovis* isolates from North America.** *Proceedings One Hundred and First Annual Meeting of the United States Animal Health Association, Louisville, Kentucky, USA, 18-24 October, 1997*. Richmond, United States Animal Health Association. 1997, p. 534-542.

**NAL Call Number:** 49.9 UN3R

**Descriptors:** cattle, deer, *Mycobacterium bovis*, strain isolates, epidemiology, restriction fragment length polymorphism, RFLP, tuberculosis, DNA fingerprinting, USA, Mexico, Canada.

Sun, L.; Kang, D.; Ge, X.; Sun, J.H.; Li, R.Z. **Application of PPA-ELISA for the detection of avian tuberculosis antibody in chicken serum.** *Chinese Journal of Animal Quarantine*. 1997. 14 (3) 11-13. Note: In Chinese.

**Descriptors:** *Mycobacterium avium*, antibodies, rabbit anti-chicken IgG immune serum, diagnostic test, PPA-ELISA, chickens, experimental infections, test sensitivity, test specificity and cost, SPF flocks.

Wilson, T.; Wards, B.J.; White, S.J.; Skou, B.; de Lisle, G.W.; Collins, D.M. **Production of avirulent *Mycobacterium bovis* strains by illegitimate recombination with deoxyribonucleic acid fragments containing an interrupted *ahpC* gene.** *Tubercle and Lung Disease*. 1997. 78 (5/6) 229-235.

**Descriptors:** DNA, recombination, illegitimate recombinants, genes, vaccines, tuberculosis, *Mycobacterium bovis* ATCC35723, electroporation, kanamycin resistance, inability for growth in minimal medium, linear fragment approach, avirulent auxotrophs.

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# Livestock

2007

Alsop, E.J.; Marr, C.; Barrelet, A.B.; McGladdery, A.J. **The use of transabdominal ultrasonography in the diagnosis and management of splenic lesions in three horses.** *Equine Veterinary Education*. 2007; 19 (1): 5-10. ISSN: 0957-7734

**URL:** <http://www.evj.co.uk>

**NAL Call Number:** SF951.E67

**Descriptors:** horses, splenic lesions, clinical picture, *Mycobacterium avium*.

Benet, J.J.; Boschioli, M.L.; Dufour, B.; Garin-Bastuji, B. **Lutte contre la tuberculose bovine en France de 1954 a 2004: analyse de la pertinence epidemiologique de l'evolution de la reglementation.** [Bovine tuberculosis control programme in France from 1954 to 2004: epidemiological relevance analysis of regulations texts.] *Epidemiologie et Sante Animale*. 2006; (50): 127-143. ISSN: 0754-2186. Note: In French with an English summary.

**Descriptors:** *Mycobacterium bovis*, collective control program, disease free in 2001, epidemiology, description of regulations and management, France.

Bennett, R.; Willis, K. **Public opinions on badger populations and the control of tuberculosis in cattle in the UK.** *Veterinary Record*. 2007; 160 (8): 266-268. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/archive/>

**NAL Call Number:** 41.8 V641

**Descriptors:** opinion survey questionnaire, prevention of bovine tuberculosis, badger management, telephone and mail survey, wildlife management sometimes necessary, role of government, opinions of population management of badgers, cost/benefit, England, Wales.

Cvetnic, Z.; Spicic, S.; Benic, M.; Katalinic-Jankovic, V.; Pate, M.; Krt, B.; Ocepek, M. **Mycobacterial infection of pigs in Croatia.** *Acta Veterinaria Hungarica*. 2007; 55 (1): 1-9. ISSN: 0236-6290

**URL:** [www.akademiai.com](http://www.akademiai.com)

**NAL Call Number:** 41.8 AC83

**Descriptors:** pigs, bacterial infections, bacterioses, disease surveillance, *Mycobacterium peregrinum*, lymph nodes, Croatia.

Flynn, Robin J.; Mannion, Celine; Golden, Olwen; Hacariz, Orcun; Mulcahy, Grace. **Experimental *Fasciola hepatica* infection alters responses to tests used for diagnosis of bovine tuberculosis.** *Infection and Immunity (IAI)*. 2007 Mar; 75 (3): 1373-1381. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** *Fasciola hepatica* is a prevalent helminth parasite of livestock. Infection results in polarization of the host's immune response and generation of type 2 helper (Th2) immune responses, which are known to be inhibitory to Th1 responses. Bovine tuberculosis (BTB) is a bacterial disease of economic and zoonotic importance. Control policies for this disease rely on extensive annual testing and a test-and-slaughter policy. The correct diagnosis of BTB relies on cell-mediated immune responses. We established a model of coinfection of *F. hepatica* and *Mycobacterium bovis* BCG to examine the impact of helminth infection on correct diagnosis. We found the predictive capacity of tests to be compromised in coinfecting animals and that *F. hepatica* infection altered macrophage function. Interleukin-4 and gamma interferon expression in whole-blood lymphocytes restimulated in vitro with *M. bovis* antigen was also altered in coinfecting animals. These results raise the question of whether *F. hepatica* infection can affect the predictive capacity of tests for the diagnosis of BTB and possibly also influence susceptibility to BTB and other bacterial diseases. Further studies on the interplay between helminth infection and BTB are warranted.

**Descriptors:** livestock, *Fasciola hepatica*, liver fluke, *Mycobacterium bovis* BCG, co-infection of helminths and bacteria, question whether bovine tuberculosis testing compromised, suggest further studies.

Foote, M.R.; Nonnecke, B.J.; Beitz, D.C.; Waters, W.R. **High growth rate fails to enhance adaptive immune responses of neonatal calves and is associated with reduced lymphocyte viability.** *Journal of Dairy Science*. 2007; 90 (1): 404-417. ISSN: 0022-0302

**URL:** <http://jds.fass.org/cgi/content/full/90/1/404>

**NAL Call Number:** 44.8 J822

**Abstract:** The objective of the study was to evaluate the effects of 3 targeted growth rates on adaptive (i.e., antigen-specific) immune responses of preruminant, milk replacer-fed calves. Calves (9.1 +/- 2.4 d of age) were assigned randomly to one of 3 dietary treatments to achieve 3 targeted daily rates of gain [no growth (maintenance) = 0.0 kg/d, low growth = 0.55 kg/d, or high growth = 1.2 kg/d] over an 8-wk period. The NRC Nutrient Requirements of Dairy Cattle calf model computer program was used to estimate the milk replacer intakes needed to achieve target growth rates. All calves were fed a 30% crude protein, 20% fat, all-milk protein milk replacer reconstituted to 14% dry matter. Diets were formulated to ensure that protein would not be limiting. All calves were vaccinated 3 wk after initiation of dietary treatments with *Mycobacterium bovis*, strain bacillus Calmette-Guerin and ovalbumin. Growth rates for no-growth (0.11 kg/d), low-growth (0.58 kg/d), and high-growth (1.16 kg/d) calves differed throughout the experimental period. Blood glucose concentrations in high-growth calves increased with time and were higher than in low- and no-growth calves. Mononuclear and polymorphonuclear leukocyte percentages in peripheral blood were unaffected by growth rate but did change with advancing age. Percentages of CD4(+) T cells increased with age in no-growth and low-growth calves, a characteristic of maturation, but failed to increase in high-growth calves. Growth rate did not affect the percentages of CD45RO(+) (memory) CD4(+) and CD8(+) T cells, antigen (i.e., ovalbumin)-specific serum IgG concentrations, or antigen (i.e., purified protein derivative)-induced IFN-gamma and nitric oxide secretion by mononuclear cell cultures. Antigen-elicited cutaneous delayed-type hypersensitivity responses of no-growth calves exceeded responses of low-growth, but not high-growth, calves. In resting- and antigen-stimulated cell cultures, viabilities of CD4(+), CD8(+), and gamma delta TCR+ T cells from high-growth calves were lower than those of the same T cell subsets from no-growth and low-growth calves. Alternatively, resting cultures of mononuclear leukocytes from high-growth calves produced more nitric oxide than those from no-growth and low-growth calves. In conclusion, adaptive immune responses were affected minimally by growth rate. The results suggest that protein-energy malnutrition in the absence of weight loss is not detrimental to antigen-specific responses of neonatal vaccinated calves and that a high growth rate does not enhance these responses. The negative effect of a high growth rate on the viability of circulating T cell populations may influence infectious disease resistance of the calf.

**Descriptors:** neonates, cattle disease, *Mycobacterium bovis*, serum, immune system, CD8+ T-cell, CD4+ T cell, adaptive immunity, growth rates.

Gumussoy, vK.S.; Atasever, A.; Aydn, F.; Ozcan, M.; Beyaz, L.; Hzlsoy, H.; Abay, S. **Prevalence of tuberculosis in cattle in Turkey.** *Medycyna Weterynaryjna*. 2007; 63 (3): 305-308. ISSN: 0025-8628. Note: In English with a Polish summary.

**NAL Call Number:** 41.8 M463

**Descriptors:** cattle, disease prevalence, bovine tuberculosis, *Mycobacterium bovis*, tissues from slaughtered cattle, 5 abattoirs, lungs, bronchi, mediastinal lymph nodes, BACTEC radiometric method was a rapid and sensitive diagnostic method, Kayseri province, Turkey.

Johnson, L.; Dean, G.; Rhodes, S.; Hewinson, G.; Vordermeier, M.; Wangoo, A. **Low-dose *Mycobacterium bovis* infection in cattle results in pathology indistinguishable from that of high-dose infection.** *Tuberculosis*. 2007; 87 (1): 71-76. ISSN: 1472-9792

**URL:** <http://www.sciencedirect.com/science/journal/14729792>

**Descriptors:** cattle, experimental infection, *Mycobacterium bovis* field strain (AF2122/97) effects of low and high doses of colony forming units, immunohistochemistry, lesion advancement and granuloma distribution, IFN gamma expression, 24 week study, no difference in infection between high and low dosages.

Jolley, M.E.; Nasir, M.S.; Surujballi, O.P.; Romanowska, A.; Renteria, T.B.; Mora, A. de la; Lim, A.; Bolin, S.R.; Michel, A.L.; Kostovic, M.; Corrigan, E.C. **Fluorescence polarization assay for the detection of antibodies to *Mycobacterium bovis* in bovine sera.** *Veterinary Microbiology*. 2007; 120 (1/2): 113-121. ISSN: 0378-1135

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** The performance of a fluorescence polarization assay (FPA) that detects antibodies to *Mycobacterium bovis*

in bovine sera is described. The FPA reported here is a direct binding primary screening assay using a small polypeptide derived from the *M. bovis* MPB70 protein. A secondary inhibition assay confirms suspect or presumed positive samples. Specificity studies involved five different veterinary laboratories testing 4461 presumed negative bovine samples. FPA specificity was 99.9%. The FPA was used to identify herd status as either *M. bovis* infected or non-infected. Herd surveillance studies (nine herds) were performed in Mexico and South Africa. The FPA had a specificity of 100% (two negative herds), and correctly identified six of seven infected herds. Finally, sera from 105 slaughter animals that had gross lesions in lymph nodes similar to those seen with bovine tuberculosis were tested by the FPA. Thin sections from the associated formalin-fixed paraffin-embedded samples of lymph nodes were stained using hematoxylin and eosin (H&E) for morphologic examination and using the Ziehl-Neelsen (ZN) method for detection of acid-fast bacilli. Of the 105 animals, 78 were classified as TB suspect based on lesion morphology, 21 were positive by ZN, 9 were positive by FPA and 13 were positive by PCR for the tuberculosis group of *Mycobacterium*. Among the 21 ZN positives, 11 (52.4%) were PCR positive. Among the 9 FPA positives, 8 (88.9%) were PCR positive. For the 13 PCR positives, 8 (61.5%) were FPA positive and 11 (84.6%) were ZN positives. These results show that use of the FPA for detection of *M. bovis* infection of cattle has value for bovine disease surveillance programs.

**Descriptors:** cattle, *Mycobacterium bovis*, disease surveillance, serological diagnosis, serological techniques, Mexico, South Africa.

Komijn, R.E.; Wisselink, H.J.; Rijsman, V.M.C.; Stockhofe-Zurwieden, N.; Bakker, D.; Zijderveld, F.G. van; Eger, T.; Wagenaar, J.A.; Putirulan, F.F.; Urlings, B.A. **Granulomatous lesions in lymph nodes of slaughter pigs bacteriologically negative for *Mycobacterium avium* subsp. *avium* and positive for *Rhodococcus equi*.** *Veterinary Microbiology*. 2007; 120 (3/4): 352-357. ISSN: 0378-1135

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** The prevalence of granulomatous lesions in lymph nodes of pigs was studied. From January till August 2004 in two slaughterhouses in The Netherlands 2 116 536 pigs were examined for the presence of granulomatous lesions in the sub-maxillary lymph nodes. In 15 900 (0.75%) of these pigs, lesions could be detected. Nine farms with the highest incidence of lesions were selected for a more detailed pathological and bacteriological examination. On these farms, the prevalence of lesions in sub-maxillary lymph nodes ranged from 2.3 to 5.7% with a mean of 3.0%. From 1276 pigs that were sampled, 98 (7.7%) displayed granulomatous lesions in the sub-maxillary lymph nodes and one (0.1%) pig showed lesions in its mesenteric lymph node. *Mycobacterium avium* subsp. *avium* (MAA) could not be isolated from the lymph nodes of the 99 pigs with lesions and from a selection of lymph nodes (n=61) of pigs without lesions. *Rhodococcus equi* was isolated from 44 out of 98 (44.9%) of the sub-maxillary lymph nodes with granulomatous lesions and from two mesenteric lymph nodes without lesions. A comparison of former studies and the current results indicate that the prevalence of MAA infections in slaughter pigs has strongly decreased over the last decade, whereas *R. equi* is highly prevalent. The high incidence of granulomatous lesions associated with the bacteriological presence of *R. equi* could be considered as a serious cause of misdiagnosis of MAA infections in cases where meat inspection is carried out by inspection for granulomatous changes of lymph nodes only..

**Descriptors:** pigs, *Mycobacterium avium*, *Rhodococcus equi*, disease surveillance, slaughter house survey, The Netherlands.

Liu, Siguo; Guo, She Ping; Wang, Chun Lai; Shao, Mei Li; Zhang, Xiu Hua; Guo, Yang; Gong, Qiang. **A novel fusion protein-based indirect enzyme-linked immunosorbent assay for the detection of bovine tuberculosis.** *Tuberculosis* (Amsterdam). 2007; 87 (3): 212-217. ISSN: 1472-9792

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/638428/description?navopenmenu=-2](http://www.elsevier.com/wps/find/journaldescription.cws_home/638428/description?navopenmenu=-2)

**Descriptors:** ELISA; serodiagnosis of *Mycobacterium bovis*; antigen genes, mpb70, mpb83, and esat-6; spliced overlap extension technology; expressed in *Escherichia coli*; fusion protein (rM7083-E6); serum testing of cattle; sensitivity and specificity.

Marsh, I.B.; Whittington, R.J. **Genomic diversity in *Mycobacterium avium*: Single nucleotide polymorphisms between the S and C strains of *M-avium* subsp *paratuberculosis* and with *M-a. avium*.** *Molecular and Cellular Probes*. 2007; 21 (1): 66-75. ISSN: 0890-8508

**URL:** <http://www.sciencedirect.com/science/journal/08908508>

**Descriptors:** sheep; cattle; *Mycobacterium avium paratuberculosis*; strain C; strain S; *Mycobacterium avium avium*;

amino acid sequence; nucleotide sequence; genomic diversity; species comparison; GenBank sequence numbers; 12,117 bp of sequence representing 26 loci across 25 genes; 11 SNPs were identified between the S and C strains in eight genes: hsp65, sodA, dnaA, dnaN, recF, gyrB, inhA, and pks8.

Meikle, V.; Schneider, M.; Azenzo, G.; Zumarraga, M.; Magnano, G.; Cataldi, A. **Individual animals of a cattle herd infected with the same *Mycobacterium bovis* genotype shows important variations in bacteriological, histopathological and immune response parameters.** *Zoonoses and Public Health*. 2007; 54 (2): 86-93. ISSN: 1863-1959

**Descriptors:** Friesian cattle, *Mycobacterium bovis*, tuberculin test, slaughterhouse surveillance, diagnostic tests comparison study, interferon gamma, PCR, bacteriological culture of nasal swab and intradermal tuberculin test, clinical parameter, tuberculosis lesions, spoligotyping, several tests recommended.

Montgomery, A. **Incidence and sensitivity of major bovine respiratory disease pathogens in Europe.** *Veterinary Times*. 2007; 37 (2): 24. ISSN: 1352-9374

**Descriptors:** cattle, acute signs of bovine respiratory disease, sampling with swabs, 220 pathogens isolated, *Arcanobacterium pyogenes*, *Histophilus*, *Mycobacterium bovis*, *Pasteurella haemolytica*, *Pasteurella multocida*, sensitivity to antibiotics, florfenicol, tilmicosin, tulathromycin, tetracycline, 8 European countries.

Mores, Nelson; Ventura, Lauren; Dutra, Valeria; Silva, Virginia S.; Barioni, Waldomiro Jr; Oliveira, Salete R.; Kramer, Beatris.; Neto, Jose S. Ferreira. **Granulomatous lymphadenitis in swine: lymph nodes affected and pathologic diagnosis of the infection caused by *Mycobacterium avium* complex agents.** *Pesquisa Veterinaria Brasileira*. 2007; 27 (1): 13-17. ISSN: 0100-736X. Note: In Portuguese.

**NAL Call Number:** SF756.37.B7 P5

**Descriptors:** 394 swine carcasses from cold storage, Service of Federal Inspection, pigs, granulomatous lesions, lymph nodes, histopathology, Ziehl-Neelsen staining, histopathological examination, immunohistochemistry with monoclonal antibody produced with cellular extract of *M. avium*, comparison of tests, Brazil.

Mukherjee, F. **Comparative prevalence of tuberculosis in two dairy herds in India.** *Revue Scientifique et Technique Office International des Epizooties*. 2006; 25 (3): 1125-1130. ISSN: 0253-1933. Note: In English with summaries in Spanish and French.

**Abstract:** Holstein Friesian cows and their crossbred progeny on a farm in northern India were tested for tuberculosis (TB) infection using a single intradermal tuberculin test. The results showed that the animals persistently harboured TB infection for periods of two to four years. The recent comparative intradermal tuberculin test revealed that at least five out of nine of these cattle reacted positively to bovine tuberculin purified protein derivative. A high (15.76%) prevalence rate resulted because none of the infected animals had been segregated or culled from the herd since the first incidence was detected in 1992. In contrast, another farm in western India that practiced segregation and culling was able to contain the level of prevalence of TB between 0.65% and 1.85%. These findings call for stricter regulations on the management of TB at farm, state and country level and a revision in the mode of breeding programmes adopted by farms..

**Descriptors:** cattle, disease control programs, effects of segregation and culling of TB infected cows, *Mycobacterium bovis*, India.

Ozygt, M.O.; Senturk, S.; Akkoc, A. **Suspected congenital generalised tuberculosis in a newborn calf.** *Veterinary Record*. 2007; 160 (9): 307-308. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/archive/>

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, newborn calf, *Mycobacterium bovis*, case report, clinical picture, postmortem examination, congenital disease, Turkey.

Porphyre, Thibaud; McKenzie, Joanna; Stevenson, Mark. **A descriptive spatial analysis of bovine tuberculosis in intensively controlled cattle farms in New Zealand.** *Veterinary Research (Les-Ulis)*. 2007; 38 (3): 465-479. ISSN: 0928-4249

**URL:** <http://www.vetres.org/>

**NAL Call Number:** SF602.A5

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, 69 farms, poisoning for depopulating area of brushtail

possum (*Trichosurus vulpecula*), wildlife disease reservoir, disease transmission from possums, North Island, New Zealand.

Raj, G.D.; Mathivanan, B.; Matheswaran, K.; Nachimuthu, K.; Davis, W.C. **Lymphocyte subset distribution in apparently normal and single intradermal test-positive water buffaloes analyzed by flow cytometry.** *Research in Veterinary Science.* 2007; 82 (1): 34-38.

**URL:** <http://www.sciencedirect.com/science/journal/00345288>

**Descriptors:** water buffalo, lymphocytes, antibodies, CD3+ lymphocytes, CD8+ cells, histocompatibility complex, peripheral blood, T cells, T4 lymphocytes, mononuclear cells, single intradermal test, *Mycobacterium bovis*.

Seward, Nathan W.; Phillips, Gregory E.; Duquette, Jared F.; Vercauteren, Kurt C. **A frightening device for deterring deer use of cattle feeders.** *Journal of Wildlife Management.* 2007; 71 (1): 271-276. ISSN: 0022-541X

**URL:** <http://www.bioone.org/perlserv/?request=get-archive&issn=0022-541X&ct=1>

**NAL Call Number:** 410 J827

**Abstract:** The presence of bovine tuberculosis (TB) in cattle can negatively impact a state's economy and cattle industry. In Michigan, USA, wild white-tailed deer (*Odocoileus virginianus*) are a reservoir for reinfecting cattle herds. Although direct TB transmission between deer and cattle is rare, infected deer may contaminate cattle feed. To mitigate this risk, we designed and evaluated a deer-resistant cattle feeder (DRCF) device for deterring deer from feeders. The device delivered negative stimuli to condition deer to avoid cattle feeders. We tested the device by conducting a comparative change experiment at a high-density captive white-tailed deer operation in northeastern lower Michigan using pretreatment and treatment periods and random allocation of DRCF protection to 3 of 6 feeders during the treatment period. We used animal-activated cameras to collect data on deer use of feeders. Deer use was similar at protected and unprotected feeders during the pretreatment period but was lower at protected feeders during the treatment period. Deer-resistant cattle feeders were 100% effective during the first 2 treatment weeks, 94% during the first 5 weeks, but effectiveness then dropped to 61% during the final week. Excluding problems associated with low battery power and infrared sensors, DRCFs were 99% effective at deterring deer. Our results suggest that DRCFs can effectively limit deer use of cattle feed, potentially with minimal impact on feeding behavior of cattle, thus reducing potential transmission of bovine TB through contaminated feed. By employing DRCFs in bovine TB endemic areas, especially at times that deer are food stressed, agencies and producers can practically and economically reduce the potential for bovine TB to be transmitted from deer to cattle.

**Descriptors:** white-tailed deer, (*Odocoileus virginianus*), feeding patterns, negative stimulus deer resistant cattle feeder, long term effectiveness, feeding stations, disease transmission between species, *Mycobacterium bovis*, wild vs captive deer operation, Michigan, US.

Smith, G.C.; Bennett, R.; Wilkinson, D.; Cooke, R. **A cost-benefit analysis of culling badgers to control bovine tuberculosis.** *Veterinary Journal.* 2007; 173 (2): 302-310. ISSN: 1090-0233

**URL:** <http://www.sciencedirect.com/science/journal/10900233>

**Descriptors:** cattle, herds, badgers (*Meles meles*), simulated culling strategies, badger trapping and gassing, disease control strategy *Mycobacterium bovis*, disease transmission, UK Government's Department for Environment Food and Rural Affairs (Defra), UK.

Twomey, D.F.; Crawshaw, T.R.; Anscombe, J.E.; Farrant, L.; Evans, L.J.; McElligott, W.S.; Higgins, R.J.; Dean, G.; Vordermeier, M.; Jahans, K.; Rua-Domenech, R. de la. **TB in llamas caused by *Mycobacterium bovis*.** *Veterinary Record.* 2007; 160 (5): 170. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/archive/>

**NAL Call Number:** 41.8 V641

**Descriptors:** llama herd, diagnosis of tuberculosis, *Mycobacterium bovis*, seroprevalence, tests for antibodies, intradermal tuberculin test, Devon, UK.

Vega-Manriquez, X.; Lopez-Vidal, Y.; Moran, J.; Adams, L.G.; Gutierrez-Pabello, J.A. **Apoptosis-inducing factor participation in bovine macrophage *Mycobacterium bovis*-induced caspase-independent cell death.** *Infection and Immunity.* 2007; 75 (3): 1223-1228. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1. I57

**Abstract:** *Mycobacterium tuberculosis* complex species survive and replicate in phagosomes of the host cell. Cell

death (CD) has been highlighted as one of the probable outcomes in this host-pathogen interaction. Previously, our group demonstrated macrophage apoptosis as a consequence of *Mycobacterium bovis* infection. In this study, we aimed to identify the contribution of apoptotic effector elements in *M. bovis*-induced CD. Bovine macrophages were either infected with *M. bovis* (multiplicity of infection, 10:1) or treated with an *M. bovis* cell extract (CFE). Structural changes compatible with CD were evaluated. Chromatin condensation was increased three times by the CFE. On the other hand, a terminal deoxynucleotidyltransferase-mediated dUTP-biotin nick end labeling (TUNEL) assay demonstrated that levels of DNA fragmentation induced by *M. bovis* and CFE were 53.7%+or-24% and 38.9%+or-14%, respectively, whereas control cells had a basal proportion of 8.9%+or-4.1%. Rates of DNA fragmentation were unaffected by the presence of the pan-caspase inhibitor N-benzyloxycarbonyl-Val-Ala-Asp (z-VAD). Cells treated with 100 micro g of CFE for 12 h had a fivefold decrease in the level of mitochondrial outer membrane permeabilization compared to that of untreated cells. Neither *M. bovis* infection nor CFE treatment induced activation of caspase 3, 8, or 9. Translocation of apoptosis-inducing factor (AIF) to the nucleus was identified in 32%+or-3.5% and 26.3%+or-4.9% of *M. bovis*-infected and CFE-treated cells, respectively. Incubation of macrophages with z-VAD prior to infection did not alter the percentage of cells showing AIF translocation. Our data suggest that *M. bovis*-induced CD in bovine macrophages is caspase independent with AIF participation.

**Descriptors:** bovine macrophages, *Mycobacterium bovis*, caspase.

Waters, W.R.; Nonnecke, B.J.; Olsen, S.C.; Palmer, M.V. **Effects of pre-culture holding time and temperature on interferon- gamma responses in whole blood cultures from *Mycobacterium bovis*-infected cattle.** *Veterinary Microbiology*. 2007; 119 (2/4): 277-282. ISSN: 0378-1135

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** The Bovigam™ assay is approved for use within the United States as a complementary tuberculosis test. Prior to whole blood culture and the ensuing ELISA to detect interferon-(IFN)- gamma, samples are subjected to various holding time/temperature combinations due, in part, to practical constraints associated with shipment of samples to approved laboratories. To evaluate these effects, 5-month-old Holstein calves (n=7) received 103 cfu *Mycobacterium bovis* by aerosol. Heparinized blood was collected 2 months after challenge and held at 4 or 22 degrees C for 0, 8 or 24 h prior to culture with mycobacterial antigens or pokeweed mitogen (PWM). Responses of samples held for 8 or 24 h were comparable and lower than responses of cultures prepared immediately after collection, regardless of holding temperature. Differences in responses of samples held at 4 degrees C versus 22 degrees C were also minimal. A subset of samples was held for 2 h at 37 degrees C at the beginning of the holding period. This subset of samples had diminished responses to all stimulants and increased holding times (i.e., 24 h versus 8 h) negatively impacted the response. Pre-processing conditions, particularly delays in set-up and initial high sample temperatures, reduces IFN-gamma responses of cells from infected cattle increasing the risk of false negatives in this assay of regulatory importance.

**Descriptors:** young Holstein cattle, experimental infection, aerosol exposure to *Mycobacterium bovis*, blood analysis, ELISA, assays, IFN-gamma responses, immunological reactions.

Westhusin, M.E.; Shin, T.; Templeton, J.W.; Burghardt, R.C.; Adams, L.G. **Rescuing valuable genomes by animal cloning: a case for natural disease resistance in cattle.** *Journal of Animal Science*. 2007; 85 (1): 138-142. ISSN: 0021-8812

**URL:** <http://www.asas.org>

**NAL Call Number:** 49 J82

**Abstract:** Tissue banking and animal cloning represent a powerful tool for conserving and regenerating valuable animal genomes. Here we report an example involving cattle and the rescue of a genome affording natural disease resistance. During the course of a 2-decade study involving the phenotypic and genotypic analysis for the functional and genetic basis of natural disease resistance against bovine brucellosis, a foundation sire was identified and confirmed to be genetically resistant to *Brucella abortus*. This unique animal was utilized extensively in numerous animal breeding studies to further characterize the genetic basis for natural disease resistance. The bull died in 1996 of natural causes, and no semen was available for AI, resulting in the loss of this valuable genome. Fibroblast cell lines had been established in 1985, cryopreserved, and stored in liquid nitrogen for future genetic analysis. Therefore, we decided to utilize these cells for somatic cell nuclear transfer to attempt the production of a cloned bull and salvage this valuable genotype. Embryos were produced by somatic cell nuclear transfer and transferred to 20 recipient cows, 10 of which became pregnant as determined by ultrasound at d 40 of gestation. One calf survived to term. At present, the

cloned bull is 4.5 yr old and appears completely normal as determined by physical examination and blood chemistry. Furthermore, in vitro assays performed to date indicate this bull is naturally resistant to *B. abortus*, *Mycobacterium bovis*, and *Salmonella typhimurium*, as was the original genetic donor.

**Descriptors:** cattle, *Brucella abortus*, *Mycobacterium bovis*, *Salmonella typhimurium*, nuclear transfer, cloned animal, resistance to disease as a genetic trait.

Witchell, J.; Vordermeier, M.; Wangoo, A.; Goyal, M. **Cytokine mRNA expression levels within BCG vaccinated and non-vaccinated, *Mycobacterium bovis* challenged cattle.** *Immunology*. 2007; 120(Suppl. 1): 69. ISSN: 0019-2805. Note: Annual Congress of the British Society of Immunology, Glasgow, UK; February 20-23, 2007.

**URL:** <http://www3.interscience.wiley.com/journal/118493028/home?cookieSet=1>

**Descriptors:** cattle, *Mycobacterium bovis*, pathogen, lymph nodes, blood and lymphatics, T-helper-type 1 cells,

Xu, Guang Xian; Zhao, De Ming; Zhou, Xiang Mei; Yin, Xiao Min; Yang, Jian Min **Expression of TNF- alpha , iNO, IL-6, and IL-12 in alveolar macrophage contribution by Mce4E protein of *Mycobacterium bovis*.** *Journal of China Agricultural University*. 2007; 12 (1): 1-6. ISSN: 1007-4333. Note: In Chinese with an English summary.

**NAL Call Number:** S19.C58

**Descriptors:** livestock infection, cell entry proteins, alveolar macrophage, exposure to *M. bovis*, expression of TNF-alpha, iNO, IL-6 and IL-12, cachectin, cachexin, immunity reactions, immunological reactions, PCR real time, tumor necrosis factor

## 2006

Aagaard, C.; Govaerts, M.; Meikle, V.; Vallecillo, A.J.; Gutierrez-Pabello, J.A.; Suarez-Guemes, F.; McNair, J.; Cataldi, A.; Espitia, C.; Andersen, P.; Pollock, J.M. **Optimizing antigen cocktails for detection of *Mycobacterium bovis* in herds with different prevalences of bovine tuberculosis: ESAT6-CFP10 mixture shows optimal sensitivity and specificity.** *Journal of Clinical Microbiology (JCM)*. 2006 Dec; 44 (12): 4326-4335. ISSN: 0095-1137

**URL:** <http://jcm.asm.org/>

**NAL Call Number:** QR46 .J6

**Abstract:** Bovine tuberculosis is a major problem in many countries; hence, new and better diagnostic tools are urgently needed. In this work, we have tested ESAT6, CFP10, PE13, PE5, MPB70, TB10.4, and TB27.4 for their potentials as diagnostic markers in field animals from Northern Ireland, Mexico, and Argentina, regions with low, medium, and high prevalences of bovine tuberculosis, respectively. At all three sites, ESAT6 and CFP10 were superior diagnostic antigens, while their combination performed even better at the two sites where the combination was tested, providing the best coverage for the detection of diseased populations. The high sensitivity in the skin test reactor groups, combined with the high specificity in the tuberculosis-free groups, indicated that a diagnosis could correctly be made for 85% of the infected animals, based on their responses to these two antigens. Furthermore, TB10.4, PE13, and PE5 have the potential to supplement ESAT6 and CFP10 in a future five-component diagnostic cocktail.

**Descriptors:** cattle, *Mycobacterium bovis*, diagnostic tools, diagnostic markers, strains from over the world, ESAT6, CFP10 superior antigens, TB10.4, PE13, and PE5.

Abernethy, D.A.; Denny, G.O.; Menzies, F.D.; McGuckian, P.; Honhold, N.; Roberts, A.R. **The Northern Ireland programme for the control and eradication of *Mycobacterium bovis*.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 231-237. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** Bovine tuberculosis is endemic in Northern Ireland and a comprehensive eradication scheme has been in operation since 1959. The current programme involves annual testing, extensive computerized tracing, short-interval testing of herds contiguous to outbreaks and compulsory slaughter of positive cattle. Despite initial reductions in disease prevalence, eradication has proved elusive and potential explanatory factors include high cattle density and potential for between-herd contact, the impact of exotic diseases on resource priorities, and significant levels of bovine tuberculosis in a wildlife reservoir, the European badger (*Meles meles*). Both the role of the infected bovine and that of the badger in spreading disease have to be addressed to ensure progress towards eradication. Current measures are

described and future options for enhancing the programme are outlined.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, disease control, disease control programs, disease surveillance, disease outbreaks, culling animals, herd health, stocking rate, wildlife, disease reservoirs, disease transmission, risk assessment, disease eradication, Northern Ireland.

Ahmed, J. **Transboundary diseases. Proceedings of the International Conference on the Impact of Endemic and Epidemic Diseases on National, Regional and International Trade, Istanbul, Turkey, February 2006.** *Journal of Veterinary Medicine Series B.* 2006; 53 (Suppl. 1): 1-42. ISSN: 0931-1793. Note: 13 papers,

**URL:** <http://www3.interscience.wiley.com/journal/120118373/tocgroup>

**Descriptors:** birds, cattle, transboundry disease, *Brucella*, foot and mouth disease virus, FMD, *Mycobacterium bovis*, peste des petits ruminants virus, avian influenza virus, bird flu, bird grippe, cattle plague, disease surveillance, seroepidemiology, poverty-alleviation, EC, EEC, European Communities, European Economic Communities, China, Pakistan, Iran, Iraq, Turkey.

Ahmed, J. **Transboundary diseases. Proceedings of the International Conference on the Impact of Endemic and Epidemic Diseases on National, Regional and International Trade, Istanbul, Turkey, February 2006.** *Journal of Veterinary Medicine Series B.* 2006; 53 (Suppl. 1): 1-42. ISSN: 0931-1793. Note: 13 papers,

**URL:** <http://www.blackwell-synergy.com/toc/jvbm/53/s1>

**Descriptors:** birds, cattle, diseases that cross political boundries, *Brucella*, foot and mouth disease virus, FMD, *Mycobacterium bovis*, peste des petits ruminants virus, avian influenzavirus, bird flu, bird grippe, cattle plague, disease surveillance, seroepidemiology, poverty alleviation, EC, EEC, European Economic Communities, China, Pakistan, Iran, Iraq, Turkey.

Allison, N. ***Mycobacterium avium* infection in a dog.** *Veterinary Medicine.* 2006 Jan; 101 (1): 14. ISSN: 8750-7943

**NAL Call Number:** 41.8 M69

**Descriptors:** dogs, *Mycobacterium avium*, case studies.

Almeida, Robson F.C.; Madruga, Claudio R.; Soares, Cleber O.; Fernandes, Marta C.; Carvalho, Nilton M.; Jorge, Klaudia S.G.; Osorio, Ana Luiza A.R. **Resposta imune especifica de bovinos experimentalmente sensibilizados com inoculos inativados de *Mycobacterium bovis* e *Mycobacterium avium*.** [Specific immune response of cattle to experimental sensibilization by inactivated *Mycobacterium bovis* and *Mycobacterium avium*.] *Pesquisa Veterinaria Brasileira.* 2006; 26(4): 195-200. ISSN: Note: In Portuguese.

**NAL Call Number:** SF756.37.B7 P5

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium avium*, bacterial pathogens, diagnosis via immune response, bacterial antigens, cervical comparative test, evolution of the specific production of gamma-interferon, identification of interference of unspecified reactions by *M. avium*, test results.

Amanfu, William. **The situation of tuberculosis and tuberculosis control in animals of economic interest.**

*Tuberculosis* (Amsterdam). 2006; 86 (3-4): 330-335. ISSN: 1472-9792

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/638428/description?navopenmenu=-2](http://www.elsevier.com/wps/find/journaldescription.cws_home/638428/description?navopenmenu=-2)

**Descriptors:** animals, tuberculosis, *Mycobacterium bovis*, public health concerns, veterinary medicine concern, incidence in humans, concerns for disease control in developed and developing countries.

Amaral, A.L. do; Mores, N.; Ventura, L. das V.; Coldebella, A.; Ludke, J.V.; Oliveira, P.A.V. de; Silva, V.S.

**Ocorrencia de linfadenite em suinos criados em sistema convencional e cama sobreposta nas fases de crescimento e terminacao.** [Occurrence of lymphadenitis in swine created in conventional and deep-litter system at the growth-termination phase.] *Revista de Ciencias Agroveterinarias.* 2006; 5 (1): 64-72. ISSN: 1676-9732.

Note: In Portuguese with an English summary.

**URL:** <http://www.cav.udesc.br>

**Descriptors:** pigs; swine housing; piggeries, litter systems compared: T1 deep-litter of wood shaving, T2 deep-litter of rice husk and T3 partially slatted floor; *Mycobacterium avium* complex; animal pathogens; granulomatous lymphadenitis; feces; liveweight gains.

Aranaz, Alicia; De Juan, Lucia; Bezos, Javier; Alvarez, Julio; Romero, Beatriz; Lozano, Francisco; Paramio, Jose L; Lopez-Sanchez, Jesus; Mateos, Ana; Dominguez, Lucas. **Assessment of diagnostic tools for eradication of bovine**

**tuberculosis in cattle co-infected with *Mycobacterium bovis* and *M. avium* subsp. *paratuberculosis*.** *Veterinary Research* (Les Ulis). 2006; 37(4): 593-606. ISSN: 0928-4249

**URL:** <http://www.vetres.org/>

**NAL Call Number:** SF602.A5

**Descriptors:** *Mycobacterium bovis*, bovine tuberculosis, *Mycobacterium avium* ssp. *paratuberculosis*, dual infected cattle herd, diagnostic tests, field trial, serial parallel testing, comparative IDTB test, IFN-gamma assay, serology of paratuberculosis, detection levels, possible cross reactivity, need for several diagnostic techniques.

Bannaliker, A.S.; Rishendra Verma. **Characterization of *Mycobacterium fortuitum* isolates from animals and their environment by PCR-RFLP analysis (PRA) of *hsp65* and *rpoB* genes.** *Indian Journal of Animal Sciences*. 2006; 76 (2): 109-113. ISSN: 0367-8318

**NAL Call Number:** 41.8 IN22

**Descriptors:** *Mycobacterium fortuitum* I and II, isolates of soil, water, animal tissue, biochemical testing, *Mycobacterium fortuitum*, amplification generated a 439 bp product, RFLP patterns, BSTEII digests, HaeIII digests, MspI digestion, species and subspecies identification.

Barlow, A.M.; Monies, R.J. **Bovine tuberculosis in pigs in Cornwall and the west of England.** *Pig Journal*. 2006; 58: 204-211

**URL:** <http://www.thepigsite.com/pigjournal/>

**Descriptors:** badgers, cattle, pigs, historical pattern of mycobacterial infection, wild and domestic pigs, environmental contamination, *Mycobacterium avium* from infected birds, *Mycobacterium bovis* from scavenged dead carcasses or feed and water, ingestion of contaminated milk or milk products, interaction with badgers is a risk, UK

Bennett, R.M.; Cooke, R.J. **Costs to farmers of a tuberculosis breakdown.** *Veterinary Record*. 2006 Apr. 1; 158 (13): 429-432. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/>

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, disease outbreaks, costs and returns, England.

Beran, V.; Matlova, L.; Horvathova, A.; Bartos, M.; Moravkova, M.; Pavlik, I. **Mycobacteria in the animal's environment in the Czech Republic.** *Veterinarski Arhiv*. 2006; 76(Supplement): S33-S39. ISSN: 0372-5480

**URL:** <http://www.vef.hr/vetarhiv>

**NAL Call Number:** 41.8 V6416

**Descriptors:** farm and captive wild animals, environmental mycobacteria, breeding facilities, tanks, fish aquaria, peat as feed supplement, 1389 samples, 29 sites, bacteria cultured, Stonebrink's medium, Herrold's egg yolk medium, Sula's medium, *Mycobacterium avium*, *Mycobacterium fortuitum*, *Mycobacterium gordonae*, *Mycobacterium marinum*, *Mycobacterium flavescens*, zoonotic infections, Czech Republic.

Blissitt, M.J. **The introduction of pre and post-movement TB testing in Scotland for cattle from high incidence TB areas.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 58-64. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle, high levels of *Mycobacterium bovis*, zoonotic diseases, testing for disease, control programs, Scotland, Britain, UK.

Brook, R.K.; McLachlan, S.M. **Factors influencing farmers' concerns regarding bovine tuberculosis in wildlife and livestock around Riding Mountain National Park.** *Journal of Environmental Management*. 2006; 80 (2): 156-166. ISSN: 0301-4797

**URL:** <http://www.sciencedirect.com/science/journal/03014797>

**NAL Call Number:** HC75.E5J6

**Abstract:** Despite intensive efforts over the last century to eradicate bovine tuberculosis (TB) in North America, several hotspots of infected wildlife and livestock remain, raising concerns that the disease will never be eradicated. The stress and frustration for a farmer caused by having a herd test positive for TB or living in an infected region can be substantial. The goal of this study was to investigate the concerns of farmers around Riding Mountain National Park (RMNP) regarding the presence of TB in wildlife and livestock and conduct an exploratory analysis of causal factors. Data were collected from 786 farmers within 50 km of RMNP using a mail-back questionnaire. Overall, farmers

indicated a high level of concern toward diseases in both wildlife and cattle relative to other concerns. The spatial variables that had the greatest influence on TB concern were both the distance of farms to the RMNP boundary and distance of farms to previous cases of TB. The most important aspatial factor associated with high TB concern was the frequency with which farmers observed elk on their land. These results underscore the important differences between 'objective' measures of risk, such as epidemiological estimates of disease prevalence, and subjective measures of disease concern, such as risk perception and acceptability of management actions. Written responses suggest that concerns regarding disease may affect how farmers view wildlife on their land and their relationship with neighbouring protected areas. Management activities that reduce the frequency of elk interactions with farms, but also recognize the complex relationship that farmers have with wildlife and protected areas, will be most effective in mitigating farmer concern regarding this important problem.

**Descriptors:** cattle, elk, wildlife disease reservoirs, disease control programs, bovine tuberculosis, farmers/ranchers concerns, disease risks, private and protected lands, Canada.

Bourne, F.J.; Donnelly, C.A.; Cox, D.R.; Gettinby, G.; McInerney, J.P.; Morrison, W.I.; Woodroffe, R. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 158 (19): 671-672. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers, cattle, *Mycobacterium bovis*, wildlife as disease reservoir, culling badgers, disease control policies.

Bourne, F.J.; Donnelly, C.A.; Cox, D.R.; Gettinby, G.; McInerney, J.P.; Morrison, W.I.; Woodroffe, R. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 158 (12): 418. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, badgers (*Meles meles*), wildlife reservoir for *Mycobacterium bovis*, UK.

Bowen-Davies, J. ***Mycobacterium bovis* in British deer.** *Deer Farming*. 2006; (82): 17-21.

**Descriptors:** deer, *Mycobacterium bovis*, zoonotic infection, active disease surveillance, immunity reactions, lack of diagnostic tests, clinical picture, *Capreolus capreolus*, red deer (*Cervus elaphus*), fallow deer (*Dama dama*), *Muntiacus*, *Mycobacterium bovis*, Britain.

Buddle, B.M.; Wedlock, D.N.; Denis, M. **Progress in the development of tuberculosis vaccines for cattle and wildlife.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 191-200. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Vaccination against bovine tuberculosis is likely to become an important disease control strategy in developing countries, which cannot afford a test and slaughter control programme, or in countries which have a wildlife reservoir of *Mycobacterium bovis* infection. In the past decade, considerable progress has been made in the development and evaluation of tuberculosis vaccines for cattle and for a range of wildlife maintenance hosts including possums, badgers, deer and African buffaloes. Experimental challenge systems have been established for the different target species and the resulting disease process has mimicked that seen in the field. In cattle, neonatal vaccination with BCG appeared to be more effective than vaccination of 6-month-old calves and in most situations no other vaccine has been shown to be better than BCG. However, prime-boost strategies involving combinations of BCG with a protein or DNA vaccine, to improve on BCG vaccination alone, have produced very encouraging results. Differential diagnostic tests have been developed using mycobacterial antigens that are only present in virulent *M. bovis* to differentiate between BCG-vaccinated and *M. bovis*-infected cattle. BCG vaccine has been shown to reduce the spread of tuberculous lesions in a range of wildlife species and a prototype oral bait delivery system has been developed.

Prospects for the development of improved vaccines against bovine tuberculosis are promising and vaccination approaches could become very valuable in the control and eradication of bovine tuberculosis.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, vaccines, vaccine development, wild animals, wildlife vaccination program, animal diseases, tuberculosis, vaccination, disease control, disease control programs, disease reservoirs, BCG vaccine, virulence, disease diagnosis, diagnostic techniques.

Buick, W. **TB in domestic species other than cattle and badgers.** *GVJ Government Veterinary Journal.* 2006; 16 (1): 87-91. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** badgers (*Meles meles*), Camelidae, cats, cattle, dogs, ferrets, goats, sheep, horses, pigs, *Mycobacterium bovis*, clinical picture, susceptibility to pathogen.

Buncic, S. **Zoonotic diseases in farm animals.** *Integrated Food Safety and Veterinary Public Health.* 2006: 57-76. ISBN: 0851999085; 9780851999081. Note: Book chapter.

**NAL Call Number:** RA601.S28 2006

**Descriptors:** farm animals, livestock, animal and human diseases, disease transmission, epidemiology bovine spongiform encephalopathy, prion diseases, brucellosis, glanders, listeriosis, mycoses, parasitoses, protozoal infections; tuberculosis, viral diseases, zoonoses, avian influenza virus; *Brucella abortus*, *Brucella suis*, *Burkholderia mallei*, *Erysipelothrix rhusiopathiae*, *Listeria*, *Mycobacterium bovis*; *Mycobacterium tuberculosis*, *Taenia saginata*, *Taenia solium*, *Trichinella pseudospiralis*, West Nile virus, zoonoses.

Buxton, David. **Wildlife and the risk to humans and domestic animals: A case for disease surveillance.** *Veterinary Journal.* 2006; 171 (2): 204-205. ISSN: 1090-0233

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623077/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623077/description#description)

**NAL Call Number:** SF601.V484

**Descriptors:** wildlife as disease reservoirs, zoonotic diseases, humans, domestic animals, parasites, bison, wolf, red deer, reindeer, sika deer, elk, *Mycobacterium bovis*, nematodes, *sarcosystis*.

Cassidy, J.P. **The pathogenesis and pathology of bovine tuberculosis with insights from studies of tuberculosis in humans and laboratory animal models.** *Veterinary Microbiology.* 2006. 112 (2-4): 151-161. ISSN: 0378-1135.

Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** This paper reviews key insights the discipline of pathology has contributed to our understanding of bovine tuberculosis in the context of findings of studies of tuberculosis in humans and laboratory animal models. Analysis and extrapolation of data from other species have the potential to expand our understanding of the pathogenesis of the disease in cattle. The distribution of lesions in affected cattle, humans and laboratory animals illustrate the primacy of the respiratory tract as portal of infection and raise questions about the role of the upper respiratory tract surface, tonsil and dorsal lung regions in disease pathogenesis and transmission. The mechanisms behind significant pathological processes such as necrosis, apoptosis and liquefaction, occurring within lesions, are explored and their potential practical significance assessed in the context of herd disease dynamics and vaccine development. It is proposed that effective 'innate' host defenses result in many animals and humans remaining disease-free and tuberculin test negative following exposure to infection. Furthermore, the concepts of latency and disease reactivation, considered significant factors in perpetuating tuberculosis in human populations, are explored in the context of the bovine disease.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, animal disease models, pathogenesis, humans, tuberculosis, zoonoses, alternative hosts, respiratory system, disease course, infection, necrosis, apoptosis, resistance mechanisms, latent period, relapse, liquefaction.

Cataluna, R.L.N.; Gordoncillo, M.J.N. **Cervical fold tuberculin testing in cattle (*Bos indicus*) and water buffaloes (*Bubalus bubalis*) in Los Banos, Laguna.** *Philippine Journal of Veterinary Medicine.* 2006; 43 (2): 103-105. ISSN: 0031-7705

**Descriptors:** water buffalo, cattle, bovine tuberculosis, *Mycobacterium bovis*, disease surveillance, PPD tuberculin test, bacterial testing, zoonotic potential, Philippines.

Cockle, P.J.; Gordon, S.V.; Hewinson, R.G.; Vordermeier, H.M. **Field evaluation of a novel differential diagnostic reagent for detection of *Mycobacterium bovis* in cattle.** *Clinical and Vaccine Immunology.* 2006; 13 (10): 1119-1124. ISSN: 1556-6811

**URL:** <http://cvi.asm.org/>

**Descriptors:** cattle; *Mycobacterium bovis*; immunodominant peptides from Rv3873, Rv3879c, Rv0288, Rv3019c; lead

diagnostic antigens ESAT-6 and CFP-10; peptide cocktail; better than *M. bovis* BCG vaccination; serological diagnosis.

Collins, J.D. **The approach to eradication of tuberculosis in cattle: an Irish perspective.** *Cattle Practice*. 2006; 14 (1): 1-6. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Abstract:** With regards to tuberculosis in cattle, the challenge to Irish agriculture is to ensure that all the stakeholders realize that without their full participation, the persistence of this disease in the national herd will continue to be a drain on the national economy and will threaten Ireland's ability to trade internationally as a supplier of high quality beef and dairy products at some time in the future. Scientific evaluation of data from the past 30 years indicates that eradication is achievable on a regional and national basis. This is provided the status of clear herds is maintained through vigilance and active cooperation between herd owners and the regulatory authorities and that a holistic approach to eradication is supported by effective risk communication at local and national level, and that defined and agreed targets are adopted and achieved on schedule. The respective roles of members of the veterinary profession in government service and, in particular, of those engaged by the owners of herds that are clear of tuberculosis and by owners of infected herds, demand a professional performance of the highest standard and the exercise of due diligence at every level to ensure the prevention, control and eradication of this zoonotic disease.

**Descriptors:** beef cattle, dairy cattle, *Mycobacterium bovis*, impact of disease on trade, dairy and beef product quality, role of veterinarians, disease prevention and control programs, Irish Republic.

Collins, J.D. **Tuberculosis in cattle: strategic planning for the future.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 369-381. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** In the later stages of eradication of tuberculosis in cattle there is a need to take account of the fact that *Mycobacterium bovis* infection in cattle presents, not as cases of clinical disease but most commonly as apparently healthy animals showing an immunological response to tuberculin. This is an entirely different scenario to that seen when national eradication programmes were first devised, at a time when the protection of public health rather than animal health was the prime motivation. In countries with active programmes to eradicate bovine tuberculosis, it is critical for the programme's success that account is taken of this redefinition of tuberculosis, side by side with changes in modern animal production systems and their impact on the transmission of *M. bovis*. This paper highlights factors critical to the success of a national eradication programme, including a clear identification of the goals, of the policies that guide actions, and of the sequences of actions that are required within the programme to accomplish these goals. Experience has illustrated the adverse effects of compromise on outcome when the application of fundamental principles of disease control such as sound animal management, removal of known sources of infection, early diagnosis, quarantine, movement control and environmental hygiene are less than enthusiastically promoted and applied. The reality is that where these principles are applied in a sustained manner, the outcome is more likely to be successful. Therein lies the challenge for the risk manager.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, program planning, disease control programs, decision making, latent period, animal husbandry, disease transmission, agricultural policy, control methods, risk management, health policy, pathogen eradication.

Corner, L.A.L. **The role of wild animal populations in the epidemiology of tuberculosis in domestic animals: how to assess the risk.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 303-312. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Tuberculosis is present in wild animal populations in North America, Europe, Africa and New Zealand. Some wild animal populations are a source of infection for domestic livestock and humans. An understanding of the potential of each wild animal population as a reservoir of infection for domestic animals is reached by determining the nature of the disease in each wild animal species, the routes of infection for domestic species and the risk of domestic animals encountering an infectious dose. The mere presence of infection in a wild animal population does not of itself provide evidence of a significant wildlife reservoir. Although at times counterintuitive, wildlife populations with high disease prevalence may not necessarily have a role in the epidemiology of disease in domestic livestock. The key

concepts used in deciding whether an infected wild animal population is involved in the epidemiology of tuberculosis in domestic livestock is illustrated by reference to six well-researched cases: the feral pig (*Suis scrofa*) and feral Asian water buffalo (*Bubalus bubalis*) in Australia, white tailed deer (*Odocoileus virginianus*) in Michigan, and the brushtail possum (*Trichosurus vulpecula*) and other species, such as the ferret (*Mustela furo*), in New Zealand. A detailed analysis of *Mycobacterium bovis* infection in the Eurasian badger (*Meles meles*) in Ireland and their role as a reservoir of infection for cattle is also presented.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, wild animals, wildlife, animal diseases, tuberculosis, alternative hosts, risk assessment, disease transmission, infection, disease prevalence, disease outbreaks, case studies, disease reservoirs.

Coryn, H.D. **Badgers, TB and modern farming practice.** *Veterinary Record.* 2006; 158 (17): 604. ISSN: 0042-4900. Note: Correspondence.

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, badgers (*Meles meles*), *Mycobacterium bovis*, relationship with modern farming practices, UK.

Cvetnic, Z.; Ocepek, M.; Lojkic, M.; Markus Cizelj, L.; Spicic, S.; Pate, M.; Krt, B. **Usporedba tuberkulinskog i *Mycobacterium bovis* gama interferonskog ( gamma -IFN) testa u dijagnostici i tuberkuloze goveda.**

[Comparison of tuberculin skin test and *Mycobacterium bovis* gamma interferon ( gamma -IFN) test in diagnosis of bovine tuberculosis.] *Praxis Veterinaria Zagreb.* 2006; 54 (1/2): 41-49. ISSN: 0350-4441. Note: In Croatian with an English summary.

**Descriptors:** cattle, tuberculin skin test and gamma interferon diagnostic tests, comparison study, *Mycobacterium bovis*.

Cvetnic, Z.; Spicic, S.; Katalinic-Jankovic, V.; Marjanovic, S.; Obrovac, M.; Benic, M.; Mitak, M.; Pavlik, I.

***Mycobacterium caprae* infection in cattle and pigs in one family farm in Croatia: a case report.** *Veterinarni Medicina.* 2006; 51 (11): 523-531. ISSN:

**URL:** <http://vetmed.vri.cz>

**NAL Call Number:** 41.9 C333

**Descriptors:** cattle, pigs, *Mycobacterium caprae*, family farm, tuberculin skin test, bovine PPD, postmortem exam, submandibular lymphnode lesions, isolates identified, classical and molecular methods, first case of *Mycobacterium caprae* in pigs, Croatia.

Daykin, J.; Pepper, B.; Green, R.; Howe, C.; Swarbrick, O. **Badger culling consultation.** *Veterinary Record* (London). 2006; 159 (7): 220. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers, cattle, *Mycobacterium bovis*, bovine tuberculosis, rules, UK.

de la Rua Domenech, R.; Goodchild, A.T.; Vordermeier, H.M.; Hewinson, R.G.; Christiansen, K.H.; Clifton-Hadley, R.S. **Ante mortem diagnosis of tuberculosis in cattle: A review of the tuberculin tests, (Sd(B-interferon assay and other ancillary diagnostic techniques.** *Research in Veterinary Science.* 2006 Oct; 81 (2): 190-210. ISSN: 0034-5288

**URL:** <http://dx.doi.org/10.1016/j.rvsc.2005.11.005>

**NAL Call Number:** 41.8 R312

**Abstract:** The early, preclinical stages of bovine TB can be detected in live animals by the use of tests of cellular immunity (the skin, (Sd(B-interferon and lymphocyte transformation tests). Tests of humoral (antibody) immunity, *Mycobacterium bovis* PCR probes on early tissue cultures or live cattle specimens, and tests based on "electronic nose" technology have been developed more recently. The key measure of diagnostic test accuracy is the relationship between sensitivity and specificity, which determines the false-positive and false-negative proportions. None of the tests currently available for the diagnosis of bovine TB allow a perfectly accurate determination of the *M. bovis* infection status of cattle. Although various factors can reduce the sensitivity and specificity of the skin tests, these remain the primary ante mortem diagnostic tools for TB in cattle, providing a cost-effective and reliable means of screening entire cattle populations. Despite the inescapable limitations of existing diagnostic tests, bovine TB has been effectively eradicated from many developed countries and regions with the implementation of sound programmes of

regular tuberculin skin testing and removal of reactors, coupled with slaughterhouse surveillance for undetected infections, repeat testing and culling of infected herds, cattle movement restrictions to prevent introduction of infected animals and occasional slaughter of entire herds with intractable breakdowns. This is likely to remain the mainstay of bovine TB control programmes for the foreseeable future. Additionally, newer ancillary in vitro diagnostic assays are now available to TB control programme managers to supplement the skin tests in defined circumstances according to the specific disease situation in each country or region. The strategic deployment of ancillary in vitro tests alongside the primary skin tests has enhanced the detection of *M. bovis*-infected cattle and reduced the number of animals slaughtered as false positives.

**Descriptors:** cattle, bovine tuberculosis; *Mycobacterium bovis*, disease diagnosis, tuberculin, interferons, diagnostic techniques, humoral immunity, PCR, polymerase chain reaction, literature reviews, skin tests, lymphocyte proliferation, electronic nose, accuracy, disease control programs, test specificity, test sensitivity,

Diguimbaye Djaibe, Colette; Hilty, Markus; Ngandolo, Richard; Mahamat, Hassane H.; Pfyffer, Gaby E.; Baggi, Franca; Hewinson, Glyn; Tanner, Marcel; Zinsstag, Jakob; Schelling, Esther. ***Mycobacterium bovis* isolates from tuberculous lesions in Chadian zebu carcasses.** *Emerging Infectious Diseases*. 2006; 12 (5): 769-771. ISSN: 1080-6040.

**URL:** <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?linkbar=plain&db=journals&term=1080-6040>

**NAL Call Number:** RA648.5.E46

**Descriptors:** zebu cattle, Arabe breed, Mboboro breed, kouri breed, *Mycobacterium bovis*, *Mycobacterium bovis*, slaughterhouse study, breed differences, trans-border and ongoing transmission indicated, Chad, Cameroon, Nigeria.

Donnelly, C.A.; Woodroffe, R.; Cox, D.R.; Bourne, F.J.; Cheeseman, C.L.; Clifton-Hadley, R.S.; Wei, G.; Gettinby, G.; Gilks P.; Jenkins H. **Positive and negative effects of widespread badger culling on tuberculosis in cattle** [electronic resource]. *Nature*. 2006 Feb. 16; 439 (7078): 843-846. ISSN: 1476-9679

**URL:** <http://dx.doi.org/10.1038/nature04454>

**NAL Call Number:** 472 N21

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, disease control, disease reservoirs, badgers, *Meles meles*, culling animals, disease prevalence, disease incidence, geographical distribution, United Kingdom.

Everett, R.E. **Eradication of bovine TB: learning from other countries.** *Veterinary Record* (London). 2006; 158 (18): 640. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** buffalo, cattle, bovine tuberculosis, *Mycobacterium bovis*, disease control and eradication, Australia, New South Wales, Northern Territory, Queensland, Western Australia.

Fischer, O.A.; Matlova, L.; Dvorska, L.; Svastova, P.; Bartos, M.; Weston, R.T.; Pavlik, I. **Various stages in the life cycle of syrphid flies (*Eristalis tenax*; Diptera: Syrphidae) as potential mechanical vectors of pathogens causing mycobacterial infections in pig herds.** *Folia Microbiologica*. 2006; 51 (2): 147-153

**URL:** <http://www.biomed.cas.cz/mbu/folia/>

**Descriptors:** pigs, syrphid flies, *Eristalis tenax*, insect vectors, disease carriers, survival and transmission, *Mycobacterium chelonae*, *Mycobacterium avium* ssp *avium*, *Mycobacterium avium* ssp *hominissuis*.

Foote, M.; Nonnecke, B.; Waters, W.; Beitz, D.; Fowler, M.; Johnson, T.; Miller, B. **High growth rate fails to enhance adaptive immune responses of neonatal calves and is associated with decreased T cell viability.** *Journal of Animal Science*. 2006; 84 (Suppl. 1): 163-164. ISSN: 0021-8812. Note: 2006 ADSA/ASAS Joint Annual Meeting, Minneapolis, MN, USA; July 09 -13, 2006

**URL:** <http://www.asas.org>

**NAL Call Number:** 49 J82

**Descriptors:** cattle, neonates, *Mycobacterium bovis*, growth rates, serum testing, adaptive immune response, decreased T cell viability, CD4 Positive T cells, CD8 positive T cells, mononuclear leukocytes.

Gagea, M.I.; Bateman, K.G.; Van Dreumel, T.; McEwen, B.J.; Carman, S.; Archambault, M.; Shanahan, R.A.; Caswell, J.L. **Diseases and pathogens associated with mortality in Ontario beef feedlots.** *Journal of Veterinary Diagnostic Investigation*. 2006 Jan; 18 (1) 18-28. ISSN: 1040-6387

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** calves, beef cattle, cattle diseases, animal pathogens, animal feeding operations, feedlots, disease incidence, disease prevalence, disease detection, bacterial infections, zoonotic viral diseases, *Mycobacterium bovis*, *Mannheimia haemolytica*, *Haemophilus somnus*, respiratory tract diseases, bacterial pneumonia, morbidity, mortality, bovine viral diarrhea virus, arthritis, pneumonic pasteurellosis, emerging diseases, Ontario

Gallagher, J.; Muirhead, R.H.; Turnbull, A.T.; Davies, J.I.; Ashton, W.L.G.; Smith, J.; Daykin, J.; McDiarmid, A. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 158 (9): 310-311. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers, (*Meles meles*), cattle, *Mycobacterium bovis*, disease eradication and control, government policies, UK.

Gallagher, J.; Muirhead, R.H.; Turnbull, A.T.; Davies, J.I.; Ashton, W.L.G.; Smith, J.; Daykin, J.; McDiarmid, A. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 159 (7): 220. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers, *Mycobacterium bovis*, bovine tuberculosis, policies, wildlife disease reservoirs, disease transmission, culling of badgers.

Gallagher, J.; Muirhead, R.H.; Turnbull, A.T.; Davies, J.I.; Ashton, W.L.G.; Smith, J.; Daykin, J.; McDiarmid, A. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 158 (15): 524. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium tuberculosis*.

Ganesan, P.I. **Excretion of mycobacteria in cattle.** *Indian Veterinary Journal*. 2006; 83 (10): 1112-1113. ISSN: 0019-6479

**URL:** [www.indvetjournal.com](http://www.indvetjournal.com)

**NAL Call Number:** 41.8 IN2

**Descriptors:** cattle, identification of infected animals, respiratory excretion of *Mycobacterium bovis*, nasal swab smears, SID test, intradermal tuberculin, experimental infection.

Gobena Ameni; Abraham Aseffa; Engers, H.; Young, D.; Hewinson, G.; Vordermeier, M. **Cattle husbandry in Ethiopia is a predominant factor affecting the pathology of bovine tuberculosis and gamma interferon responses to mycobacterial antigens.** *Clinical and Vaccine Immunology*. 2006; 13 (9): 1030-1036. ISSN: 1556-6811

**URL:** <http://cvi.asm.org/>

**Abstract:** Bovine tuberculosis is a major economic problem and a potential public health risk. Improved diagnostics like the gamma interferon (IFN-gamma) test with ESAT6 and/or CFP10 could contribute to the control program. We assessed IFN-gamma responses in zebu (Ethiopian Arsi breed) and Holstein cattle kept indoors or in a pasture to tuberculin purified protein derivative (PPD) and an ESAT6-CFP10 protein cocktail. Furthermore, the intensity and distribution of pathology of bovine tuberculosis were compared between the two breeds. Our data demonstrated significantly (all  $P < 0.02$ ) higher IFN-gamma responses to avian PPD, bovine PPD, and the ESAT6-CFP10 protein cocktail in Holstein than in zebu cattle, while lesion severities in infected animals and tuberculin skin test responses did not differ significantly ( $P > 0.05$ ) between the two breeds. Holstein cattle that were kept indoors produced significantly (all  $P < 0.01$ ) higher IFN-gamma levels in response to avian PPD, bovine PPD, and the ESAT6-CFP10 protein cocktail than did Holstein cattle kept in a pasture. Moreover, lesion severity was significantly higher in Holstein cattle kept indoors ( $P = 0.001$ ) than in those kept in the pasture. Lesions were localized predominantly in the digestive tract in cattle kept in a pasture, while they were localized in the respiratory tract in cattle kept indoors. In conclusion, in Holstein cattle, husbandry was a dominant factor influencing the severity of tuberculosis lesions and IFN-gamma responses to mycobacterial antigens compared to breed. A difference in the cellular immune response between zebu and Holstein cattle was observed, while tuberculosis lesion severities were identical in the two breeds, when both were kept in a pasture..

**Descriptors:** zebu cattle, Holstein cattle, *Mycobacterium bovis*, zebu, indoor housing, pastured animals, improved

diagnostics, gamma interferon (IFN-gamma ) test with ESAT6 and/or CFP10, Ethiopia, Abyssinia.

Godden, S.; McMartin, S.; Feirtag, J.; Stabel, J.; Bey, R.; Goyal, S.; Metzger, L.; Fetrow, J.; Wells, S.; Chester-Jones, H. **Heat-treatment of bovine colostrum. II: Effects of heating duration on pathogen viability and immunoglobulin G.** *Journal of Dairy Science*. 2006 Sept; 89 (9): 3476-3483. ISSN: 0022-0302

**NAL Call Number:** 44.8 J822

**Abstract:** Batches (30-L) of first-milking bovine colostrum, inoculated with *Mycoplasma bovis* (10 superscript 8(B cfu/mL), *Listeria monocytogenes* (10 superscript 6(B cfu/mL), *Escherichia coli* O157:H7 (10 superscript 6(B cfu/mL), *Salmonella enteritidis* (10 superscript 6(B cfu/mL), and *Mycobacterium avium* subsp. *paratuberculosis* (Map; 10 superscript 3(B cfu/mL), were heat-treated at 60AC for 120 min in a commercial on-farm batch pasteurizer system.

Duplicate 50-mL subsamples of colostrum were collected at 15-min intervals throughout the heat-treatment process for the purpose of bacterial culture and for measurement of IgG concentration (mg/mL) and antibody activity [log subscript 2(B(bovine viral diarrhea virus type 1 serum neutralization titer)]. Four replicate batches of colostrum were run for each of the 5 pathogens studied. There was no effect of heating moderate- to high-quality colostrum at 60AC for at least 120 min on mean IgG concentration (pre = 60.5 mg/mL; post = 59.1 mg/mL). Similarly, there was no effect of heat-treatment on the mean log subscript 2(B bovine viral diarrhea virus type 1 serum neutralization titer (pre = 12.3; post = 12.0). Viable *M. bovis*, *L. monocytogenes*, *E. coli* O157:H7, and *S. enteritidis* added to colostrum could not be detected after the colostrum was heat-treated at 60AC for 30 min. Average bacteria counts showed that Map was not detected when batches were heated at 60AC for 60 min. Although the authors believe that heat-treating colostrum at 60AC for 60 min should be sufficient to eliminate Map from colostrum in most situations, further research is needed to determine whether these findings may be replicated, given that variability was observed in Map culture results.

**Descriptors:** first milking colostrum, inoculation with *Mycoplasma bovis*, *Mycobacterium avium paratuberculosis*, *Salmonella enteritidis*, *Listeria monocytogenes*, *Escherichia coli*, heat treatment process to inactivate the pathogens.

Godden, S.; McMartin, S.; Feirtag, J.; Stabel, J.; Bey, R.; Goyal, S.; Metzger, L.; Fetrow, J.; Wells, S.; Chester-Jones, H. **Heat-treatment of bovine colostrum. II: Effects of heating duration on pathogen viability and immunoglobulin G.** *Journal of Dairy Science*. 2006 Sept; 89 (9): 3476-3483. ISSN: 0022-0302

**URL:** <http://jds.fass.org/cgi/content/full/89/9/3476>

**NAL Call Number:** 44.8 J822

**Abstract:** Batches (30-L) of first-milking bovine colostrum, inoculated with *Mycoplasma bovis* (10 superscript 8(B cfu/mL), *Listeria monocytogenes* (10 superscript 6(B cfu/mL), *Escherichia coli* O157:H7 (10 superscript 6(B cfu/mL), *Salmonella enteritidis* (10 superscript 6(B cfu/mL), and *Mycobacterium avium* subsp. *paratuberculosis* (Map; 10 superscript 3(B cfu/mL), were heat-treated at 60AC for 120 min in a commercial on-farm batch pasteurizer system.

Duplicate 50-mL subsamples of colostrum were collected at 15-min intervals throughout the heat-treatment process for the purpose of bacterial culture and for measurement of IgG concentration (mg/mL) and antibody activity [log subscript 2(B(bovine viral diarrhea virus type 1 serum neutralization titer)]. Four replicate batches of colostrum were run for each of the 5 pathogens studied. There was no effect of heating moderate- to high-quality colostrum at 60AC for at least 120 min on mean IgG concentration (pre = 60.5 mg/mL; post = 59.1 mg/mL). Similarly, there was no effect of heat-treatment on the mean log subscript 2(B bovine viral diarrhea virus type 1 serum neutralization titer (pre = 12.3; post = 12.0). Viable *M. bovis*, *L. monocytogenes*, *E. coli* O157:H7, and *S. enteritidis* added to colostrum could not be detected after the colostrum was heat-treated at 60AC for 30 min. Average bacteria counts showed that Map was not detected when batches were heated at 60AC for 60 min. Although the authors believe that heat-treating colostrum at 60AC for 60 min should be sufficient to eliminate Map from colostrum in most situations, further research is needed to determine whether these findings may be replicated, given that variability was observed in Map culture results.

**Descriptors:** first milking colostrum, inoculation with *Mycoplasma bovis*, *Mycobacterium avium paratuberculosis*, *Salmonella enteritidis*, *Listeria monocytogenes*, *Escherichia coli*, heat treatment process to inactivate the pathogens.

Gomes da Silva, Paulo Eduardo; Pinheiro, Sonia Regina; Lizandra do Rego Leal, Marta; Bertagnon, Heloisa Godoi; Pinto-Coelho-Motta, Pedro Moacyr; Sinhorini, Idercio Luiz; Vasconcellos, Silvio-Arruda; Benesi, Fernando Jose.

**Teste de tuberculinizacao em caprinos (*Capra hircus*) experimentalmente sensibilizados. [Tuberculin test in experimentally sensitized goats (*Capra hircus*)]** *Ciencia Rural*. 2006; 36 (3): 880-886. ISSN: 0103-8478. Note: In Portuguese.

**URL:** [http://www.scielo.br/scielo.php/script\\_sci\\_serial/pid\\_0103-8478/Ing\\_en/nrm\\_iso](http://www.scielo.br/scielo.php/script_sci_serial/pid_0103-8478/Ing_en/nrm_iso)

**NAL Call Number:** S192.R4

**Descriptors:** goats, 3 groups, *Mycobacterium avium* D4, *Mycobacterium bovis* AN5, control with saline, tuberculin testing, skin sampling, mononuclear inflammatory infiltrate of 96h after tuberculin inoculation.

Gopal, R.; Goodchild, A.; Hewinson, G.; Domenech, R. de la R.; Clifton-Hadley, R. **Introduction of bovine tuberculosis to north-east England by bought-in cattle.** *Veterinary Record* (London). 2006; 159 ( 9): 265-271. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle herds, bovine tuberculosis, *Mycobacterium bovis*, restocking after FMD in 2001, infected purchased animals, spoligotype and variable number tandem repeats indicated source was Wales, Cheshire herds, Irish imports, Britain, England.

Good, M. **Bovine tuberculosis eradication in Ireland.** *Irish Veterinary Journal*. 2006; 59 (3): 154-162. ISSN: 0368-0762

**URL:** [www.veterinary-ireland.org](http://www.veterinary-ireland.org)

**NAL Call Number:** 41.8 IR4

**Descriptors:** cattle, bovine tuberculosis, eradication program started in 1950, European trading condition for live animals, reduction in disease levels, *Mycobacterium bovis* levels, wild badgers (*Meles meles*), disease reservoirs, disease transmission, disease prevention and control in wild animals, Ireland.

Gormley, E.; Doyle, M.B.; Fitzsimons, T.; McGill, K.; Collins, J.D. **Diagnosis of *Mycobacterium bovis* infection in cattle by use of the gamma-interferon (Bovigam) assay.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 171-179. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** The strategic use of the gamma-interferon (IFN-gamma) assay (Bovigam) can provide a means for the early identification of *Mycobacterium bovis* infected cattle, thus ensuring their removal from an infected herd. When used in parallel with the tuberculin test, it is capable of identifying infected cattle, which might otherwise not be detected until later, if at all. The early detection and removal of these animals reduces the risk that they will become a source of infection for other cattle. When targeted in herds of high prevalence the benefits to the herd owner directly concerned can be considerable as the assay provides a means of shortening the period of restriction for such herds. This serves to generate confidence among herd owners and other stakeholders that effective schemes, based on sound scientific principles, can be developed to eradicate tuberculosis from infected cattle populations.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease diagnosis, interferons, diagnostic techniques, tuberculin, culling animals, early diagnosis, disease transmission, disease prevalence, disease control, disease control programs.

Gordejo, F.J. Reviriego.; Vermeersch, J.P. **Towards eradication of bovine tuberculosis in the European Union.** *Veterinary Microbiology*. 2006; 112 (2-4, Sp. Iss. SI): 101-109. ISSN: 0378-1135

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** eradication of bovine tuberculosis, historical review, legislation, cattle trade, cattle breeding systems, environmental condition, epidemiology, *Mycobacterium bovis*, summary of the current status of the disease, EU policies.

Griffin, J.F.T.; Rodgers, C.R.; Liggett, S.; Mackintosh, C.G. **Tuberculosis in ruminants: characteristics of intra-tonsillar *Mycobacterium bovis* infection models in cattle and deer.** *Tuberculosis*. 2006; 86 (6): 404-418. ISSN: 1472-9792

**URL:** <http://www.sciencedirect.com/science/journal/14729792>

**Descriptors:** cattle, red deer (*Cervus elaphus*), *Mycobacterium bovis*, intra-tonsillar, immunity reactions, immunological reactions, resistance to disease, susceptibility to disease, species comparison.

Hancox, M. **Confusion over cattle tuberculosis.** *Letters in Applied Microbiology*. 2006; 43 (2): 236. ISSN: 0266-8254

**URL:** <http://www3.interscience.wiley.com/journal/118581679/abstract>

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium tuberculosis*, species differences in lung lesions, transmission between cattle and badgers, routes of infection.

Hermoso de Mendoza, J.; Parra, A.; Tato, A.; Alonso, J.M.; Rey, J.M.; Pena, J.; Garcia-Sanchez, A.; Larrasa, J.; Teixido, J.; Manzano, G. **Bovine tuberculosis in wild boar (*Sus scrofa*), red deer (*Cervus elaphus*) and cattle (*Bos taurus*) in a Mediterranean ecosystem (1992-2004).** *Preventive Veterinary Medicine*. 2006 May 17; 74 (2-3): 239-247. ISSN: 0167-5877

**URL:** <http://dx.doi.org/10.1016/j.prevetmed.2005.10.005>

**NAL Call Number:** SF601.P7

**Descriptors:** cattle, cattle diseases, wild boars, *Sus scrofa*, red deer, *Cervus elaphus*, paratuberculosis, *Mycobacterium bovis*; epidemiological studies, disease transmission, wildlife livestock relations, game animals, risk assessment, ecosystems, disease surveillance, disease prevalence, disease detection, wildlife management, Spain.

Hewinson, R.G.; Vordermeier, H.M.; Smith, N.H.; Gordon, S.V. **Recent advances in our knowledge of *Mycobacterium bovis*: a feeling for the organism.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 127-139. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Significant and rapid progress has been made in our knowledge and understanding of *Mycobacterium bovis* since the last international *M. bovis* conference 5 years ago. Much of this progress has been underpinned by the completion of the genome sequence. This important milestone has catalysed research into the development of a number of improved tools with which to combat bovine tuberculosis. In this article we will review recent progress made in the development of these tools and in our understanding of the organism, its evolution and spread.

Comparison of the genome sequence with those of other members of the *Mycobacterium tuberculosis* complex has enabled insights into the evolution of *M. bovis*. This analysis also indicates that the *M. tuberculosis* complex have the propensity to adapt to new host species. The use of high throughput molecular typing methods has revealed that the recent bovine tuberculosis epidemic in Great Britain is being driven by a number of clonal expansions, which cannot be explained by random mutation and drift alone. Completion of a number of mycobacterial genome sequences has allowed the development of antigen mining techniques that rapidly identify *M. bovis*-specific genes. These can then be used as reagents in the gamma interferon assay to increase the specificity of the assay and also to discriminate between Bacillus of Calmette and Guérin (BCG) vaccinated animals and those infected with *M. bovis*. In the longer term, comparisons between the genomes of *M. bovis* and BCG will allow insight into how BCG became attenuated following serial passage on artificial growth media and reveal clues into how to improve the vaccine efficacy of BCG.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, genomics, nucleotide sequences, microbial genetics, genome, evolution, host range, adaptation, disease outbreaks, genetic drift, bacterial antigens, BCG vaccine, vaccination, molecular sequence data.

Hines, N.; Payeur, J.B.; Hoffman, L.J. **Comparison of the recovery of *Mycobacterium bovis* isolates using the BACTEC MGIT 960 system, BACTEC 460 system, and Middlebrook 7H10 and 7H11 solid media.** *Journal of Veterinary Diagnostic Investigation*. 2006 May; 18 (3): 243-250. ISSN: 1040-6387

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** cattle, lymph nodes, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, strains, pathogen identification, diagnosis, culture media, tissue analysis, niacin, nitrates, microbial contamination, disease detection, new methods.

Horwitz, Marcus A.; Harth, Guenter; Dillon, Barbara Jane; Maslesa-Galic, Sasa. **A novel live recombinant mycobacterial vaccine against bovine tuberculosis more potent than BCG.** *Vaccine*. 2006; 24 (10): 1593-1600. ISSN: 0264-410X **URL:**

[http://www.elsevier.com/wps/find/journaldescription.cws\\_home/30521/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/30521/description#description)

**Descriptors:** vaccination, cattle, other domesticated animal diseases, wild animal as disease reservoirs, *Mycobacterium bovis*, live recombinant vaccine, rBCG30 expresses large amounts of the *Mycobacterium tuberculosis*, 30kDa major secretory protein, more efficacious against bovine tuberculosis than BCG, aerosol challenge.

Jahans, K.; Worth, D. **The laboratory diagnosis of bovine tuberculosis.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 53-57. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle, *Mycobacterium bovis*, diagnosis, intradermal tests, PCR, zoonotic infections.

Johnson, Linda; Gough, Julie; Spencer, Yvonne; Hewinson, Glyn; Vordermeier, Martin; Wangoo, Arun.

**Immunohistochemical markers augment evaluation of vaccine efficacy and disease severity in bacillus Calmette-Guerin (BCG) vaccinated cattle challenged with *Mycobacterium bovis*.** *Veterinary Immunology and Immunopathology*. 2006; 111(3-4): 219-229. ISSN: 0165-2427.

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Abstract:** Development of necrotic granulomas in response to *Mycobacterium bovis* infection in cattle is pathognomonic for bovine tuberculosis. Previously our laboratory reported on *M. bovis* granuloma classification by stage of lesion advancement within bovine lymph nodes and developed immunohistochemical markers to further characterize these granulomas. In this study of bovine lymph node granulomas we applied this classification system to assess the dynamics of vaccination challenge. Lymph nodes collected from cattle vaccinated with *M. bovis* bacillus Calmette-Guerin (BCG) and subsequently challenged with virulent *M. bovis* were compared to lymph nodes from unvaccinated, challenged cattle. Expression of interferon-(Sd(B (IFN-(Sd(B), transforming growth factor-(Sb(B (TGF-(Sb(B), type I procollagen and cell marker identification of T cells, B cells, macrophages and WC1+(Sd(Bdelta TCR+ cells were assessed. Granulomas formed in vaccinated cattle were greatly reduced in number, area, degree of necrosis and peripheral fibrosis and contained fewer Langhans' giant cells, acid fast bacilli, WC1+(Sd(Bdelta TCR+ cells and less TGF-(Sb(B expression in comparison to controls. B cells clustered intensely along the outer granuloma margins within vaccinated calves, with significantly more IFN-(Sd(B producing cells identified in the medullary regions of lymph nodes from BCG-vaccinated animals compared to unvaccinated controls. This may be indicative of immune activation and surveillance in regions not directly associated with ongoing disease. Lymph node evaluation using light microscopy and immunohistochemical markers is useful to assess the immune response and discriminate granulomas to determine vaccine efficacy and disease severity.

**Descriptors:** cattle, infected with *Mycobacterium bovis* BCG, virulent *Mycobacterium bovis*, necrotic granulomas, lesion classification, histochemical markers, lymph node granulomas, dynamics of vaccine challenge, IFN-gamma, TGF-beta, type I procollagen, cell marker identification of T cells, B cells, macrophages and WC1+gamma delta TCR+ cells.

Johnston, A.M. **The 1901 Congress on Tuberculosis: John McFadyean and beyond.** *Veterinary Microbiology*. 2006; 112 (2/4): 347-368. ISSN: 0378-1135. Note: Special issue: S.J.More, More; J.D. Collins; E. Gormley; M. Good; R.A. Skuce; J.M. Pollock (editors). *Proceedings of the 4th International Conference on Mycobacterium bovis, Dublin, Ireland, 22-26 August 2005*.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** *Mycobacterium bovis*, cattle, humans, historical congress discussed, disease transmission, epidemiology, tuberculin testing.

Kaneene, J.B.; Miller, R.; Meyer, R.M. **Abattoir surveillance: the U.S. experience.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 273-282. ISSN: 0378-1135. Note: Paper presented at the *4th International Conference on Mycobacterium bovis, Held August 22-26, 2005, Dublin, Ireland*.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Abattoir, or slaughter, surveillance has been an important component of bovine tuberculosis control and eradication programs in the U.S., and has adapted to changes in the livestock market from farm to table, and the threat of bovine tuberculosis from a wildlife reservoir. The purpose of this overview was to describe the current goals of U.S. bovine tuberculosis slaughter surveillance, describe the elements of slaughter surveillance in the U.S., describe enhancements to the slaughter surveillance system, and discuss future challenges for the U.S. bovine tuberculosis surveillance program. Government regulations and the scientific literature were examined to provide information for this paper. The control and eradication of bovine tuberculosis in livestock falls to the United States Department of Agriculture and two agencies within the Department: the Food Safety and Inspection Service (FSIS) and the Animal

and Plant Health Inspection Service (APHIS). FSIS conducts routine slaughter surveillance for disease or conditions that render carcasses unsuitable for human consumption, while APHIS is involved in antemortem bovine tuberculosis testing, and necropsy and investigation of bovine tuberculosis cases identified through slaughter surveillance or antemortem testing. Results from the previous 5 years of surveillance are presented. Enhancements have been added to the current surveillance system to improve its performance. An incentive program has been used to increase the numbers of tissues submitted for laboratory examination, the state of Michigan is implementing electronic animal identification under a pilot program, and expansions to the current system are being developed to accommodate new livestock industries. The success of these programs and challenges for the future are discussed.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control, disease control programs, disease outbreaks, disease transmission, meat inspection, disease surveillance, slaughter, slaughterhouses, zoonoses, humans, tuberculosis, health policy, agricultural policy, pathogen eradication, United States.

Kantor, I.N. de; Ritacco, V. **An update on bovine tuberculosis programmes in Latin American and Caribbean countries.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 110-119. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Of the approximately 374 million cattle in Latin America and the Caribbean, 70% are held in areas where rates of *Mycobacterium bovis* infection in cattle are higher than 1%. The remaining 30% are in countries where infection affects less than 1% of cattle, including 62 million in countries where bovine tuberculosis infection is virtually nil. Measures for controlling bovine tuberculosis are partially or extensively applied in most of the countries in the Region. These measures are based on test and slaughter, notification, post-mortem inspection and surveillance in slaughterhouses. A coordinated production, standardization and quality control of purified protein derivatives is urgently required for use in control and eradication campaigns in order to assure reliability of reagents and comparability of data on tuberculin testing within the Region. On the basis of information from Argentina, *M. bovis* is estimated to cause 2% of all human cases of tuberculosis in the Region. Slaughterhouse and dairy farms workers are most-frequently infected, with infection occurring via the respiratory tract. Various in vitro assays for the diagnosis of bovine tuberculosis have been developed and/or assessed in the Region, and DNA fingerprinting has been applied for a comprehensive understanding of the epidemiology of bovine tuberculosis at the local and regional level.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, disease control, disease control programs, quarantine, literature reviews, disease incidence, epidemiology, agricultural policy, culling animals, disease surveillance, disease diagnosis, analytical kits, DNA profiling, zoonoses, public health, tuberculosis, humans, pathogen eradication, Latin America, Caribbean.

Karls, R. **Tuberculosis in cattle: how to get the upper hand.** *Veterinary Journal*. 2006; 171 (2): 193-194. ISSN: 1090-0233. Note: An editorial.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623077/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623077/description#description)

**NAL Call Number:** SF601.V484

**Descriptors:** cattle, humans, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, zoonotic disease, disease control, vaccine development, tuberculosis, vaccination.

Katoch, R.C.; Mandeep Sharma; Kisthwaria, R.S.; Subhash Verma; Rajinder Kumar. **Confirmation of pulmonary tuberculosis by isolation and by PCR-RFLP in a crossbred cow.** *Indian Veterinary Journal*. 2006; 83 (3): 338-339. ISSN: 0019-6479

**URL:** <http://www.indvetjournal.com>

**NAL Call Number:** 41.8 IN2

**Descriptors:** crossbred cow, *Mycobacterium tuberculosis*, bovine tuberculosis, pulmonary disease, case study, Himachal Pradesh, India.

Kazwala, R.R.; Kusiluka, L.J.M.; Sinclair, K.; Sharp, J.M.; DAbstractorn, C.J. **The molecular epidemiology of *Mycobacterium bovis* infections in Tanzania.** *Veterinary microbiology*. 2006 Feb. 25; 112 (2-4): 201-210. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** A molecular epidemiological study to determine the zoonotic importance of bovine tuberculosis was carried out in Tanzania. Specimens from human cases of tuberculosis as well as from slaughtered cattle were collected from regions with a high proportion of extrapulmonary tuberculosis. In order to determine the similarity of strains from the two sources, molecular typing techniques, namely RFLP and spoligotyping, were used to determine the genetic profile of the strains involved. The results of pTBN12 typing of *M. bovis* from cattle and man have shown a rather heterogeneous population of this species spread all over Tanzania, assuming that the present sample is representative.

There were 13 different pTBN12 RFLP types encountered. The genetic relatedness between the pTBN12 RFLP patterns indicated a high degree of relatedness (86%) between the dominant pTBN12 genotypes existing in Tanzania.

There were 13 different spoligotypes found in this study, whose genetic relatedness was also high (79%). DNA profiles were also confirmed by IS986 RFLP, which revealed that strains have 1-13 copies of IS986. Geographically, there was overlap between pTBN12 RFLP and spoligotypes amongst strains isolated from various parts of Tanzania.

The diversity of the RFLP and spoligotype patterns observed in Tanzania probably reflects the extensive internal movements of cattle belonging to pastoralists. The evidence of overlap between DNA fingerprints of *M. bovis* from cattle and man has once more highlighted a need for synergy of veterinary and medical policies in the control of tuberculosis in Tanzania and probably in other developing countries.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, microbial genetics, disease incidence, strains, zoonoses, humans, tuberculosis, strain differences, pathogen identification, genotype, restriction fragment length polymorphism, genetic markers, geographical distribution, wildlife vaccination programs, Tanzania.

Khan, M.Z.; Khan, A. **Basic facts of mastitis in dairy animals: a review.** *Pakistan Veterinary Journal.* 2006; 26 (4): 204-208. ISSN: 0253-8318

**Descriptors:** buffalo, cattle, *Corynebacterium*, *Escherichia coli*, *Mycobacterium*, *Mycobacterium tuberculosis*, *Mycoplasma*, *Pseudomonas*, *Staphylococcus*, *Staphylococcus aureus*, *Streptococcus*, *Streptococcus agalactiae*, *Streptococcus dysgalactiae*, chemotherapy, milk constituents, milk contamination, Pakistan.

Kinne, J.; Johnson, B.; Jahans, K.L.; Smith, N.H.; Ul Haq, A.; Wernery, U. **Camel tuberculosis-a case report.** *Tropical Animal Health and Production.* 2006 Apr; 38 (3): 207-213. ISSN: 0049-4747

**URL:** <http://dx.doi.org/10.1007/s11250-006-4366-8>

**NAL Call Number:** SF601 .T7

**Descriptors:** dromedary camel, case report, *Mycobacterium tuberculosis* complex, tuberculosis, lungs, disease diagnosis, United Arab Emirates

Klerk, L. de; Michel, A.L.; Grobler, D.G.; Bengis, R.G.; Bush, M.; Kriek, N.P.J.; Hofmeyr, M.S.; Griffin, J.F.T.; MacKintosh, C.G. **An experimental intratonsilar infection model for bovine tuberculosis in African buffaloes, *Syncerus caffer*.** *Onderstepoort Journal of Veterinary Research.* 2006; 73 (4): 293-303. ISSN: 0030-2465

**Descriptors:** buffalo (*Syncerus-caffer*) cattle, high and low dose levels of *Mycobacterium bovis*, experimental infection, intratonsilar inoculation, vaccine evaluation, intradermal tuberculin test, invitro modified interferon gamma assay, postmortem exam, lesion development assessed.

Kruuk, H. **Control of badgers and bovine TB.** *Veterinary Record* (London). 2006; 158 (13): 455. ISSN: 0042-4900. Note: Correspondence.

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, disease, control, wildlife as a disease reservoir, UK.

Lambert, W.; Gobena-Ameni; Manaye, K.; Yalemtehay, Mekonnen. **Study on bovine tuberculosis in the Holeta dairy farm, Central Ethiopia.** *Journal of Animal and Veterinary Advances.* 2006; 5 (12): 1150-1154. ISSN: 1680-5593

**Descriptors:** dairy cattle, farm study, *Mycobacterium bovis*, bovine tuberculosis, zoonotic disease, control measures, retesting a herd after 2 years, recommend regular testing and removal of TB positive animals, Ethiopia.

Leslie, N.W. **Spread of bovine TB as a result of restocking.** *Veterinary Record* (London). 2006; 159 (12): 396. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, disease transmission, movement of cattle to restock farms, *Mycobacterium bovis*, spread of disease.

Li, Jing Jing; Zhao, De Ming; Xu, Guang Xian; Zhou, Xiang Mei; Yin, Xiao Min. **Cloning and expression of *Mycobacterium bovis* secreted protein MPB83 in *Escherichia coli*.** *Journal of China Agricultural University*. 2006; 11 (6): 19-22. ISSN: 1007-4333. Note: In Chinese with an English summary.

**NAL Call Number:** S19.C58

**Descriptors:** *Mycobacterium bovis*, cloning of the MPB83 gene, analysis of its expression, SDS-PAGE and western blotting technique, possible diagnostic tool.

Li, Rui Fang; Qin, Ai Jian; Xu, Jin Jun. **Preparation of the specific monoclonal antibody against bovine gamma - interferon and its properties.** *Chinese Journal of Zoonoses*. 2006; 22 (8): 755-758. ISSN: 1002-2694. Note: In Chinese with an English summary.

**Descriptors:** cattle, *Mycobacterium bovis*, monoclonal, antibody, fusion SP2/0cells and immunized mice spleen cells, immunogen on BALB/cmice, BovIFN-gamma 4A3 BovIFN-gamma4G5, use for surveillance and control of TB in milk cows.

Lilenbaum, W.; Fonseca, L. de S. **The use of ELISA as a complementary tool for bovine tuberculosis control in Brazil.** *Brazilian Journal of Veterinary Research and Animal Science*. 2006; 43 (2): 256-261. ISSN: 1413-9596. Note: English with a Portuguese summary.

**Descriptors:** cattle, *Mycobacterium bovis*, control program, infected herds, lung lesions, culling animals, ELISA, serological testing, diagnostic tests, Rio de Janeiro, Brazil.

Livingstone, P.G.; Ryan, T.J.; Hancox, N.G.; Crews, K.B.; Bosson, M.A.J.; Knowles, G.J.E.; McCook, W.

**Regionalisation: a strategy that will assist with bovine tuberculosis control and facilitate trade.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 291-301. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** It is expected that the revised chapter on bovine tuberculosis in the Terrestrial Animal Health Code of the Office Internationale des Epizooties (OIE) will embrace regionalisation as a functional means of assisting countries, states or regions to meet the requirements for freedom from tuberculosis and to facilitate trade. The benefits and applications of regionalisation, which comprises zoning and compartmentalisation, are discussed. Regionalisation requires that a country's veterinary administration is able to implement transparent and auditable biosecurity measures that will ensure that the tuberculosis-free status of a subpopulation of cattle is maintained despite the presence of infection in another cattle subpopulation, or in other domestic or wild animal species. Zoning, which requires cattle subpopulations to be separated by geographic boundaries, provides a practical basis whereby countries, states or regions, can progress towards freedom from tuberculosis, regardless of the source of infection for defined cattle subpopulations. Compartmentalisation however, requires that husbandry or management practices will be used to prevent a tuberculosis-free cattle subpopulation from contacting inter-specific and intra-specific sources of infection. This will be difficult to achieve except for specialised cases such as artificial breeding centers.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control, disease control programs, international trade, disease transmission, biosecurity, disease prevention, wild animals, animal diseases, tuberculosis, geographical distribution, animal husbandry, disease surveillance, wildlife, case studies, disease reservoirs, pathogen eradication, regionalization, New Zealand.

Lopes, L.B.; Cunha, A.P. da; Mota, R.A.; Leite, R.C. **Comparacao de duas tecnicas de tuberculinizacao em bufalos. [Comparison of two tuberculin tests in buffaloes.]** *Ciencia Animal Brasileira*. 2006; 7 (2): 187-191. ISSN: 1518-2797

**Descriptors:** buffalo, 11 different herds, *Mycobacterium bovis*, diagnostic test, comparison study, single tuberculin test, comparative tuberculin test, mammalian antigen, combined mammalian and avian antigens, Brazil.

Macdonald, D.W.; Riordan, P.; Mathews, F. **Biological hurdles to the control of TB in cattle: a test of two hypotheses concerning wildlife to explain the failure of control.** *Biological Conservation*. 2006; 131 (2): 268-286. ISSN: 0006-3207

**URL:** <http://www.sciencedirect.com/science/journal/00063207>

**NAL Call Number:** S900.B5

**Descriptors:** badgers (*Meles meles*), wildlife as disease reservoirs, culling badgers, disease transmission, *Mycobacterium bovis*, bovine tuberculosis, control programs, disease surveillance, Britain, United Kingdom.

Mathews, Fiona; Macdonald, David W.; Taylor, G Michael; Gelling, Merryl; Norman, Rachel A.; Honess, Paul E.; Foster, Rebecca; Gower, Charlotte M.; Varley, Susan; Harris, Audrey; Palmer, Simonette; Hewinson, Glyn; Webster, Joanne P. **Bovine tuberculosis (*Mycobacterium bovis*) in British farmland wildlife: the importance to agriculture.** *Proceedings of the Royal Society Biological Sciences Series B.* 2006; 273 (1584): 357-365. ISSN: 0962-8452

**URL:** <http://journals.royalsociety.org/home/main.mpx>

**NAL Call Number:** 501 L848

**Descriptors:** British cattle herd, cattle diseases, *Mycobacterium bovis*, wildlife disease reservoirs, bank voles, badgers, pathogen levels, probably not the most important source of disease, economic costs.

Meade, K.G.; Gormley, E.; Park, S.D.E.; Fitzsimons, T.; Rosa, G.J.M.; Costello, E.; Keane, J.; Coussens, P.M.; MacHugh, D.E. **Gene expression profiling of peripheral blood mononuclear cells (PBMC) from *Mycobacterium bovis* infected cattle after in vitro antigenic stimulation with purified protein derivative of tuberculin (PPD).** *Veterinary Immunology and Immunopathology.* 2006; 113 (1/2): 73-89. ISSN: 0165-2427

**URL:** <http://www.sciencedirect.com/science/journal/01652427>

**NAL Call Number:** SF757.2.V38

**Descriptors:** cattle, *Mycobacterium bovis*, bovine tuberculosis, immunity reactions, immunological reactions, mRNA, peripheral blood mononuclear cells, purified protein derivative, PPD.

Michel, A.L.; Bengis, R.G.; Keet, D.F.; Hofmeyr, M.; de Klerk, L.M.; Cross, P.C.; Jolles, A.E.; Cooper, D.; Whyte, I.J.; Buss, P. **Wildlife tuberculosis in South African conservation areas: implications and challenges.** *Veterinary Microbiology.* 2006 Feb. 25; 112 (2-4): 91-100. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Tuberculosis, caused by *Mycobacterium bovis*, was first diagnosed in African buffalo in South Africa's Kruger National Park in 1990. Over the past 15 years the disease has spread northwards leaving only the most northern buffalo herds unaffected. Evidence suggests that 10 other small and large mammalian species, including large predators, are spillover hosts. Wildlife tuberculosis has also been diagnosed in several adjacent private game reserves and in the Hluhluwe-iMfolozi Park, the third largest game reserve in South Africa. The tuberculosis epidemic has a number of implications, for which the full effect of some might only be seen in the long-term. Potential negative long-term effects on the population dynamics of certain social animal species and the direct threat for the survival of endangered species pose particular problems for wildlife conservationists. On the other hand, the risk of spillover infection to neighboring communal cattle raises concerns about human health at the wildlife-livestock-human interface, not only along the western boundary of Kruger National Park, but also with regards to the joint development of the Greater Limpopo Trans-frontier Conservation Area with Zimbabwe and Mozambique. From an economic point of view, wildlife tuberculosis has resulted in national and international trade restrictions for affected species. The lack of diagnostic tools for most species and the absence of an effective vaccine make it currently impossible to contain and control this disease within an infected free-ranging ecosystem. Veterinary researchers and policy-makers have recognized the need to intensify research on this disease and the need to develop tools for control, initially targeting buffalo and lion.

**Descriptors:** African buffalo, (*Syncerus caffer*), wild animals, *Mycobacterium bovis*, animal pathogenic bacteria, tuberculosis, wildlife, animal diseases, conservation areas, disease outbreaks, alternative hosts, disease transmission, endangered species, literature reviews, lions (*Panthera leo*), disease control, disease reservoirs, South Africa, Zimbabwe, Mozambique.

Miller, R.A.; Kaneene, J.B. **Evaluation of historical factors influencing the occurrence and distribution of *Mycobacterium bovis* infection among wildlife in Michigan.** *American Journal of Veterinary Research.* 2006 Apr; 67 (4): 604-615. ISSN: 0002-9645.

**NAL Call Number:** 41.8 Am3A

**Descriptors:** cattle, white tailed deer, *Mycobacterium bovis*, bovine tuberculosis, disease reservoirs, spatial distribution, disease outbreaks, *Odocoileus virginianus*, temporal variation, risk factors, disease prevalence, wildlife livestock relations, population density, population size, environmental factors, animal husbandry, wildlife management, ribotypes, zoonoses, Michigan.

Mitchell, A. **Bovine TB: modelling and predicting its distribution in GB using CTS data.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 46-52. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle, *Mycobacterium bovis*, modeling of disease distribution, zoonotic infections, Great Britain.

Mobius, P.; Lentzsch, P.; Moser, I.; Naumann, L.; Martin, G.; Kohler, H. **Comparative macrorestriction and RFLP analysis of *Mycobacterium avium* subsp. *avium* and *Mycobacterium avium* subsp. *hominissuis* isolates from man, pig, and cattle.** *Veterinary Microbiology*. 2006 Oct 31; 117 (2-4): 284-291. ISSN: 0378-1135

**URL:** <http://dx.doi.org/10.1016/j.vetmic.2006.05.005>

**NAL Call Number:** SF601.V44

**Abstract:** In Germany, tuberculous lesions in slaughtered pigs due to infection with members of the *Mycobacterium avium* complex are increasingly reported. Contaminated food originating from pig or other livestock is discussed as potential source of human infection. *M. avium* isolates from man (n = 45), pig (n = 29), and cattle (n = 13) were characterised by restriction fragment length polymorphism (RFLP) with respect to insertion sequences IS1245 and IS901 as well as by XbaI-based pulsed-field gel electrophoresis (PFGE) and the results were compared by computer cluster correlation analysis, to determine potential sources of infection in man. By PCR, 55% of animal isolates was identified as *M. avium* subsp. *avium*, and 45% as *M. a. hominissuis*. All human isolates belonged to *M. a. hominissuis*. IS1245-RFLP and PFGE resulted in two distinct main groupings reflecting the two subspecies, and dividing the isolates into several subgroups. Animal isolates of *M. a. hominissuis* were widely distributed within the subgroups of human isolates. *M. a. avium* isolates, further discriminated by IS901-RFLP, formed host-associated subgroups for animals. Comparison of RFLP patterns with those of PFGE resulted in different subgroups as well as different pairs of isolates with high similarities. Only two isolates exhibited identical patterns by both methods. In general, results of both methods support the possibility that *M. a. hominissuis* isolates from livestock represent a source of infection for man, probably by common environmental reservoirs. There was no evidence of human infections caused by *M. a. avium* in Germany.

**Descriptors:** pigs, humans, *Mycobacterium avium avium*, *Mycobacterium avium hominissuis*, bacterial isolates, zoonotic tb strains, food contamination, RFLP characterization, Germany.

Moda, G. **Non-technical constraints to eradication: the Italian experience.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 253-258. ISSN: 0378-1135. Note: *Paper presented at the 4th International Conference on Mycobacterium bovis, Held August 22-26, 2005, Dublin, Ireland.*

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Although technical constraints to eradication of bovine tuberculosis are well-recognized, non-technical constraints can also delay progress towards eradication, leading to inefficiency and increased programme costs. This paper seeks to analyze the main non-technical constraints that can interfere with the successful implementation of tuberculosis eradication plans, based on experiences from an area of high tuberculosis prevalence in Regione Piemonte, Italy. The main social and economic constraints faced in the past 20 years are reviewed, including a social reluctance to recognize the importance of seeking eradication as the goal of disease control, effective communication of technical issues, the training and the organization of veterinary services, the relationship between the regional authority and farmers and their representatives, and data management and epidemiological reporting. The paper analyses and discusses the solutions that were applied in Regione Piemonte and the benefits that were obtained. Tuberculosis eradication plans are one of the most difficult tasks of the Veterinary Animal Health Services, and non-technical constraints must be considered when progress towards eradication is less than expected. Organizational and managerial resources can help to overcome social or economic obstacles, provided the veterinary profession is willing to address technical, but also non-technical, constraints to eradication.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control, disease control programs, disease prevalence, pathogen eradication, economic analysis, economic costs, social behavior, social barriers, veterinarians, social environment, Italy.

Monies, R.J. **Tuberculous pneumonia and BVD in housed calves.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 81-86. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** calves, cattle, disease levels, bovine diarrhea virus, BVD, cattle, *Mycobacterium bovis*, postmortem inspections, autopsy reports, clinical picture, mucosal diseases, multiple infections, death rates, United Kingdom.

More, S.J.; Collins, J.D.; Gormley, E.; Good, M.; Skuce, R.A.; Pollock, J.M. **Proceedings of the 4th International Conference on *Mycobacterium bovis*, Dublin, Ireland, 22-26 August 2005.** *Veterinary Microbiology*. 2006; 112 (2/4): 89-391. ISSN: 0378-1135. Note: Special issue: S.J. More; J.D. Collins; E. Gormley; M. Good; R.A. Skuce; J.M. Pollock (editors). *Proceedings of the 4th International Conference on Mycobacterium bovis, Dublin, Ireland, 22-26 August 2005*.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** humans, livestock domestic animals, cattle, wild animals, *Mycobacterium bovis*, diagnosis, epidemiology, zoonotic disease prevalence, pathogenesis, diagnosis and control, vaccination, animal reservoirs, vaccine development.

More, S.J.; Collins, J.D.; Gormley, E.; Good, M.; Skuce, R.A.; Pollock, J.M. **4th International Conference on *Mycobacterium bovis*: workshop reports.** *Veterinary Microbiology*. 2006; 112 (2/4): 383-391. ISSN: 0378-1135. Note: Special issue: S.J. More; J.D. Collins; E. Gormley; M. Good; R.A. Skuce; J.M. Pollock (editors). *Proceedings of the 4th International Conference on Mycobacterium bovis, Dublin, Ireland, 22-26 August 2005*.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** conference workshop reports, policy, strategy, *Mycobacterium bovis*, disease control, disease eradication programs, diagnosis, molecular epidemiology, wild animals as disease reservoirs, vaccines, vaccination of animals, cattle, livestock.

More, S.J.; Good, M. **The tuberculosis eradication programme in Ireland: a review of scientific and policy advances since 1988.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 239-251. ISSN: 0378-1135. Note: Paper presented at the *4th International Conference on Mycobacterium bovis, held August 22-26, 2005, Dublin, Ireland*.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** A national programme to eradicate bovine tuberculosis commenced in Ireland in 1954. During the last 15-20 years, research has been conducted to address gaps in knowledge of disease epidemiology, to objectively evaluate alternative strategy options, and to critically assess the implementation of disease control strategies. This paper provides a review of scientific and policy advances in Ireland since 1988, relevant to the tuberculosis eradication programme in Ireland. There have been substantial advances in knowledge of aspects of disease epidemiology, relating to cattle-to-cattle transmission, the role of wildlife, transmission of infection from wildlife and methods to minimise wildlife-to-cattle transmission. Further, scientific advances have been made both in the detection and management of infected herds. With respect to policy, the paper describes current policy and policy advances in both the detection and management of infected herds, as well as current strategies to prevent herd breakdowns. The Irish programme is a useful example of science-informed policy in a national context.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, disease control, disease control programs, disease surveillance, disease outbreaks, culling animals, wildlife, animal diseases, tuberculosis, disease reservoirs, diagnosis, disease transmission, pathogen identification, pathogen eradication, literature reviews, agricultural policy, Irish Republic.

Mores, N.; Amaral, A.L.; Ventura, L.; Silva, R.A.M.; Silva, V.S.; Barioni-Junior, W. **Comparacao entre metodos de tuberculinizacao no diagnostico da infeccao por agentes do complexo *Mycobacterium avium* ou *M. bovis* em suinos.** [Comparative study of methods of tuberculin skin test with the avium and bovine tuberculin in the diagnosis of the infection by agents of the *Mycobacterium avium*-complex or *M. bovis* in swine.] *Arquivo Brasileiro de Medicina Veterinaria e Zootecnia*. 2006; 58 (5): 708-717. ISSN: 0102-0935. Note: In Portuguese with an English summary.

**NAL Call Number:** SF604.A76

**Descriptors:** hogs, swine, naturally and experimentally infected hogs, tuberculin skin test with avian and bovine PPD,

detection of pathogen, skin readings compared to gross lesions and histological changes in lymph nodes, diameter of reaction.

Mustafa, A.S.; Skeiky, Y.A.; Al Attiyah, R.; Alderson, M.R.; Hewinson, R.G.; Vordermeier, H.M. **Immunogenicity of *Mycobacterium tuberculosis* antigens in *Mycobacterium bovis* BCG-vaccinated and *M. bovis*-infected cattle.**

*Infection and immunity (IAI)*. 2006 Aug.; 74 (8): 4566-4572. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The development of novel vaccine strategies supplementing *Mycobacterium bovis* BCG (BCG) constitutes an urgent research challenge. To identify potential subunit vaccine candidates, we have tested a series of eight recently identified *Mycobacterium tuberculosis* antigens in *M. bovis*-infected and BCG-vaccinated cattle. These antigens were characterized on the basis of their ability to induce in vitro gamma interferon responses in infected or BCG-vaccinated calves. We were able to establish a hierarchy of these antigens based on how frequently they were recognized in both groups of animals. In particular, we were able to prioritize frequently recognized proteins like Rv0287, Rv1174, and Rv1196 for future evaluation as subunit vaccines to be used in BCG-protein heterologous prime-boost vaccination scenarios. In addition, the antigen most dominantly recognized in *M. bovis*-infected cattle in this study, Rv3616c, was significantly less frequently recognized by BCG vaccinees and could be a target to improve BCG, for example, by increasing its secretion, in a recombinant BCG vaccine.

**Descriptors:** cattle, vaccines, subunit vaccine candidates, eight *Mycobacterium tuberculosis* antigens, *Mycobacterium bovis*-infected and BCG-vaccinated cattle, Rv3616c antigen.

Nassar, A.F.de C.; Roxo, E.; Portugal, M.A.da S.C. **Revisao: tuberculose genital em bovinos e bubalinos. [Review: genital tuberculosis in cattle and water buffaloes.]** *Revista de Educacao Continuada do CRMV-SP*. 2005; 8 (2): 135-144. ISSN: 1516-3326. Note: In Portuguese with English and Spanish summaries.

**Descriptors:** cattle, water buffalo, *Mycobacterium bovis*, genital tuberculosis, endometritis, incidence over 30 years, economic impact, zoonotic disease public health concern, contaminated raw milk and cheese, bovine mastitis, complications, disease prevalence; epidemiology, Sao Paulo, Brazil.

Nishath Latheef; Ganesan, P.I. **Haematological and biochemical parameters in tuberculin reactor and non reactor cattle.** *Indian Veterinary Journal*. 2006; 83 (8): 918-919. ISSN: 0019-6479

**URL:** [www.indvetjournal.com](http://www.indvetjournal.com)

**NAL Call Number:** 41.8 IN2

**Descriptors:** cattle, *Mycobacterium bovis*, intradermal tuberculin test reactions, description of positive reaction, hematology of test reactors, blood cell counts, hemoglobin, hematocrit, serum biochemistry, clinical responses.

Nishi, J.S.; Shury, T.; Elkin, B.T. **Wildlife reservoirs for bovine tuberculosis (*Mycobacterium bovis*) in Canada: strategies for management and research.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 325-338. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** In Canada, there are two known regional foci where wildlife populations are infected with bovine tuberculosis (*Mycobacterium bovis*) and considered to be disease reservoirs. Free-ranging populations of wood bison (*Bison bison athabasca*) in and around Wood Buffalo National Park (WBNP) and wapiti (*Cervus elaphus manitobensis*) in and around Riding Mountain National Park (RMNP) are infected with bovine tuberculosis. In this paper, we provide an overview of these diseased wild ungulate populations and the complexities of attempting to manage issues relating to bovine tuberculosis in and around protected areas. We do not describe the quantitative science and epidemiological data in detail from these case histories, but instead compare and contrast these two cases from a broader perspective. This is achieved by reviewing the context and process by which a diverse group of stakeholders engage and develop strategies to address the controversial problems that diseased wildlife populations often present. We suggest that understanding the factors that drive the strategic-level management processes is equally important for addressing a wildlife disease problem as the tactical-level issues, such as design and implementation of technically sound field research and management programs. Understanding the experiences within the WBNP and RMNP areas, particularly the strategies that have failed or succeeded, may prove useful to understanding and improving management approaches when wildlife are infected with *M. bovis*. Applying this understanding is consistent

with the principles of adaptive management in which we learn from previous experiences to develop better strategies for the future.

**Descriptors:** cattle, food animals, *Mycobacterium bovis*, wood bison (*Bison bison athabasca*), Wood Buffalo National Park, wapiti (*Cervus elaphus manitobensis*), Riding Mountain National Park, diseased wild ungulate populations, disease management issues in protected areas, how to approach strategic level management processes, disease vectors, disease transmission, control programs, literature reviews, wildlife management, wild animals, wildlife, animal diseases, tuberculosis, alternative hosts, disease outbreaks, disease transmission, conservation areas, case studies, disease control programs, disease reservoirs, Alberta, Canada.

O'Brien, D.J.; Schmitt, S.M.; Fitzgerald, S.D.; Berry, D.E.; Hickling, G.J. **Managing the wildlife reservoir of *Mycobacterium bovis*: The Michigan, USA, experience.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 313-323. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Historical, social and economic factors combined to provide a focus where bovine tuberculosis has become established in free-ranging wildlife in northeastern lower Michigan. White-tailed deer, the primary reservoir and maintenance host of tuberculosis, are highly valued by the public, and particularly hunters, for cultural and economic reasons. Since 1995, significant progress has been made in defining and reducing the reservoir of tuberculosis in deer. As yet, no other wildlife species has been shown to play an epidemiologically important role in the disease cycle. The importance of deer and deer hunting to Michigan has uniquely shaped tuberculosis control policies, and poses ongoing challenges as wildlife managers strive to maintain momentum for broad control strategies, and develop focused strategies that are publicly acceptable. Even if momentum and funding can be maintained, tuberculosis will likely continue to be present for a decade or longer. Thus, cattle producers waiting for tuberculosis to be eradicated from wildlife to eliminate risks to their herds and markets face disappointment for the foreseeable future. Such unrealistic expectations also place Michigan's federal tuberculosis accreditation status at perpetual risk. Accredited free status is unlikely to be regained without accompanying changes in cattle management. In Michigan, management of tuberculosis has clearly demonstrated that social issues and public approval are likely to be the critical limiting factors in control.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, wildlife management, deer, wild animals, wildlife, tuberculosis, alternative hosts, disease outbreaks, disease transmission, case studies, social barriers, public opinions, sport hunting, disease control programs, disease control programs, disease reservoirs, Michigan.

Olea-Popelka, F.; Butler, D.; Lavin, D.; McGrath, G.; O'Keeffe, J.; Kelton, D.; Berke, O.; More, S.; Martin, W. **A case study of bovine tuberculosis in an area of County Donegal, Ireland.** *Irish Veterinary Journal*. 2006; 59 (12): 683-690. ISSN: 0368-0762

**URL:** [www.veterinary-ireland.org](http://www.veterinary-ireland.org)

**Descriptors:** cattle, badgers, disease level, herd to herd transmission, bovine tuberculosis, *Mycoabacterium bovis*, animal disease control-programs, Eire, Irish Republic.

Olea-Popelka, F.J.; Phelan, J.; White, P.W.; McGrath, G.; Collins, J.D.; O'Keeffe, J.; Duggan, M.; Collins, D.M.; Kelton, D.F.; Berke, O. **Quantifying badger exposure and the risk of bovine tuberculosis for cattle herds in county Kilkenny, Ireland.** *Preventive Veterinary Medicine*. 2006 July 17; 75 (1-2): 34-46. ISSN1: 0167-5877

**URL:** <http://dx.doi.org/10.1016/j.prevetmed.2006.01.014>

**NAL Call Number:** SF601.P7

**Descriptors:** cattle, cattle diseases, bovine tuberculosis, *Mycobacterium bovis*, epidemiological studies, disease transmission, wildlife, disease reservoirs, badgers, *Meles meles*, risk assessment, wildlife livestock relations, pastures, cattle grazing, cattle housing, herd health, disease incidence, quantitative analysis, Irish Republic.

Oloya, J.; Opuda-Asibo, J.; Djonne, B.; Muma, J.B.; Matope, G.; Kazwala, R.; Skjerve, E. **Responses to tuberculin among Zebu cattle in the transhumance regions of Karamoja and Nakasongola district of Uganda.** *Tropical Animal Health and Production*. 2006 May; 38 (4): 275-283. . ISSN: 0049-4747

**URL:** <http://dx.doi.org/10.1007/s11250-006-4322-7>

**NAL Call Number:** SF601.T7

**Descriptors:** zebu, seroprevalence, bovine tuberculosis, risk factors, drinking water, dry season, *Mycobacterium bovis*, transhumance regions, skin tests, zoonoses, Uganda.

Palmer, M.V.; Waters, W.R. **Advances in bovine tuberculosis diagnosis and pathogenesis: what policy makers need to know.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 181-190. ISSN: 0378-1135. Note: Paper presented at the *4th International Conference on Mycobacterium bovis, Held August 22-26, 2005, Dublin, Ireland*.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** The mainstay of tuberculosis diagnosis in cattle and deer has been the tuberculin skin test. Recent advances have allowed the incorporation of blood based assays to the diagnostic arsenal for both cattle and deer. Use of defined and specific antigens has allowed for improved specificity of cell mediated assays in both cattle and deer and advances in antibody tests for tuberculosis have potential for use in free-ranging and captive cervid populations. Combined use of blood-based assays with skin testing will require further understanding of the effect of skin testing on the accuracy of blood based assays. Models of experimental infection of cattle have allowed for increased understanding of natural disease pathogenesis. Differences likely exist; however, between cattle and deer in both disease distribution and primary route of inoculation in naturally infected animals.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease diagnosis, pathogenesis, disease course, agricultural policy, health policy, zoonoses, diagnostic techniques, deer, wild animals, animal diseases, tuberculosis, disease transmission, epidemiology, interferons, tuberculin, bacterial antigens.

Palmer, M.V.; Waters, W.R.; Thacker, T.C.; Greenwald, R.; Esfandiari, J.; Lyashchenk, K.P. **Effects of different tuberculin skin-testing regimens on gamma interferon and antibody responses in cattle experimentally infected with *Mycobacterium bovis*.** *Clinical and Vaccine Immunology*. 2006; 13 (3): 387-394. ISSN: 1556-6811

**URL:** <http://cvi.asm.org/>

**NAL Call Number:** RB46.5

**Descriptors:** Holstein calves, experimental infection, *Mycobacterium bovis*, whole blood cellular immunoassay, bovine gamma interferon, INF gamma, comparative cervical test, caudal fold test, timing of testing may affect results.

Pavlik, I. **The experience of new European Union Member States concerning the control of bovine tuberculosis.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 221-230. ISSN: 0378-1135. Note: Paper presented at the *4th International Conference on Mycobacterium bovis, Held August 22-26, 2005, Dublin, Ireland*.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** On 1 May 2004, 10 new States joined the European Union, including Cyprus (CY), the Czech Republic (CR), Estonia (ES), Hungary (HU), Latvia (LA), Lithuania (LI), Malta (MA), Poland (PO), Slovakia (SK), and Slovenia (SN). Using OIE and published data, this paper summarizes the status of bovine and human tuberculosis in animals in these countries between 1996 and 2003. National control programmes against bovine tuberculosis in cattle have been successful: the current herd incidence of this disease in cattle is currently lower than 0.2%, so all countries meet the OIE requirements for freedom from the disease. Furthermore, two countries have already been officially declared bovine tuberculosis-free EU States: the CR on 31 March 2004 (European Commission Decision No. 2004/320/EC) and SK on 4 March 2005 (Commission Decision No. 2005/179/EC). The last outbreak of bovine tuberculosis was diagnosed in cattle in CY (1928), ES (1986), LA (1989), SK (1993), CR (1995), and MA (2001).

However, several issues of concern remain including the potential existence of a wildlife reservoir, the presence of *Mycobacterium bovis*, *M. caprae*, and other members of the *M. tuberculosis* complex (particularly *M. tuberculosis* or *M. microti*) in imported domestic or wild animals, and the potential for delayed detection of bovine tuberculosis in those States where annual tuberculin testing is no longer performed on cattle older than 24 months.

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium bovis*, *Mycobacterium caprae*, members of the *Mycobacterium tuberculosis* complex (particularly *Mycobacterium tuberculosis*, *ycobacterium microti*), animal pathogenic bacteria, bovine tuberculosis, disease control, disease control programs, humans, tuberculosis, zoonoses, disease incidence, herd health, disease outbreaks, wildlife, animal diseases, disease diagnosis, disease surveillance, disease reservoirs, European Union.

Pereira-Suarez, A.L.; Estrada-Chavez, C.; Arriaga-Diaz, C.; Espinosa-Cueto, P.; Mancilla, R. **Coexpression of NRAMP1, iNOS, and nitrotyrosine in bovine tuberculosis.** *Veterinary Pathology*. 2006; 43 (5): 709-717. ISSN: 0300-9858

**URL:** <http://www.acvp.org>

**NAL Call Number:** 41.8 P27

**Abstract:** In murine models the inducible nitric oxide synthase (iNOS) and the natural resistance associated macrophage protein (NRAMP1) play major roles in host defence against mycobacteria. iNOS regulates nitric oxide (NO) production, which is noxious for ingested mycobacteria, and NRAMP1 displays pleiotropic antimicrobial effects, including upregulation of iNOS expression. Little is known about the role of these molecules in bovine tuberculosis (TB). In this work we demonstrate by Western blot a high expression of NRAMP1 in peripheral blood mononuclear cells (PBMCs), alveolar macrophages (obtained by bronchioalveolar lavage), and lymph node granulomas from 8 Holstein-Friesian cattle with autopsy-proven bovine TB. Immunohistochemistry revealed the abundant expression of NRAMP1 and iNOS in lymph node and lung granulomas. Immunoreactivity was abundant in the cytoplasm of many epithelioid macrophages and multinucleated giant cells of the Langhans type. A striking accumulation of nitrotyrosine (NT), an indicator of iNOS activity and local NO production, was observed in granuloma cells, particularly in multinucleated Langhans cells. This study shows that the expression of NRAMP1 and iNOS is costimulated in granulomas, which are protective T-cell reactions against mycobacteria..

**Descriptors:** Holstein-Friesian cattle, murine model, lymph node granulomas, T cells, nitric oxide synthase; nitrotyrosine *Mycobacterium bovis*.

Perrin, G.; Heraud, J.L. **Patologie dei piccoli ruminanti la diagnosi della tubercolosi nei caprini. [Diagnosis of tuberculosis in goats.]** *Summa, Animali da Reddito*. 2006; 1 (2): 45-48. ISSN: 1125-6745. Note: In Italian.

**Descriptors:** goats, diagnosis of TB, *Mycobacterium bovis*, disease surveillance, Italy.

Pfeiffer, D.U. **Communicating risk and uncertainty in relation to development and implementation of disease control policies.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 259-264. ISSN: 0378-1135. Note: Paper presented at the *4th International Conference on Mycobacterium bovis, Held August 22-26, 2005, Dublin, Ireland*.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Scientific evidence is one of the key factors to be considered in the development of disease control policies. It is generated using investigations into cause-effect relationships, which usually produce results that are associated with a varying degree of uncertainty. Experience has shown that taking account of these uncertainties can become a formidable challenge for policy makers when devising the strategies and when communicating them to stakeholders. The situation has been further complicated by a reduction in public trust in scientific evidence. It is now recognized that this challenge cannot be managed by simply providing more information, but it is also necessary to consider the influence that variation in risk perception amongst stakeholders has on their response to and commitment towards the policies.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control programs, disease prevalence, risk assessment, agricultural policy, health policy, communication human, public opinion, risk communication, consumer information, scientific evidence.

Proano-Perez, Freddy; Rigouts, Leen; Brandt, Jef; Dorny, Pierre; Ron, Jorge; Chavez, Maria Augusta; Rodriguez, Richar; Fissette, Krista; Van Aerde, Anita; Portaels, Francoise; Benitez-Ortiz, Washington. **Preliminary observations on *Mycobacterium* ssp in dairy cattle in Ecuador.** *American Journal of Tropical Medicine and Hygiene*. 2006; 75(2): 318-323.

**URL:** [www.ajtmh.org](http://www.ajtmh.org)

**Descriptors:** bovine tuberculosis, dairy cattle production, 1,012 cattle, 59 farms, tuberculin test, comparative tuberculin test, slaughter house tissue, *Mycobacterium bovis*, effect of dairy herd size, Mejia canton, Ecuador.

Proud, A.J. **Some lessons from the history of the eradication of bovine tuberculosis in Great Britain.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 11-18. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle. *Mycobacterium bovis*, history of eradication programs, lessons learned, disease distribution, zoonotic infections, Great Britain.

Radunz, B. **Surveillance and risk management during the latter stages of eradication: experiences from Australia.** *Veterinary Microbiology*. 2006 Feb 25; 112(2-4): 283-290. ISSN: 0378-1135. Note: Paper presented at the *4th International Conference on Mycobacterium bovis, Held August 22-26, 2005, Dublin, Ireland*

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** The paper reviews the eradication of bovine tuberculosis from Australia with special reference to surveillance and managing the risk of animals exposed to tuberculosis infected animals during the latter stages of eradication. The successful eradication was based on a sound technical program with strong industry and government support. The model of joint industry and government funding and decision-making first used during the brucellosis and tuberculosis eradication campaign (BTEC) has been successfully incorporated within subsequent livestock disease control programs in Australia. An overview of the history of tuberculosis eradication in Australia provides a background to the surveillance approach. Australia was fortunate that there were no wildlife reservoir hosts. Feral animal reservoir hosts were removed during the eradication program. Surveillance to detect rare diseases is recognized to be statistically challenging with high resource requirements. Australian veterinary authorities have a high level of confidence that the combination of increasing sensitivity of abattoir surveillance systems by the submission of all granulomas detected at slaughter with increasing risk management of animals exposed to tuberculosis infected animals during the final stages of eradication provides a high level of assurance that *Mycobacterium bovis* has been eradicated.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control programs, disease outbreaks, disease transmission, risk management, disease surveillance, decision making, agricultural history, wildlife, animal diseases, tuberculosis, disease reservoirs, slaughterhouses, meat inspection, pathogen eradication, culling animals, Australia

Ramirez-Casillas, I.C.; Santillan-Flores, M.A.; Arellano-Reynoso, B.; Morales-Alvarez, F.; Tenorio-Gutierrez, V.R.

**Detection of *Mycobacterium bovis* nucleotide sequences from nasal mucus of experimentally inoculated goats.** *Veterinaria Mexico*. 2006; 37 (2): 191-196. ISSN: 0301-5092. Note: In English and Spanish.

**URL:** <http://www.medigraphic.com/veterinariamexico/>

**NAL Call Number:** SF604.V485

**Descriptors:** goats, fast reliable molecular method for *Mycobacterium bovis*, field application, M-PCR technique, detecting bacterial pathogen DNA in mucus, experimental infection, experimental transmission, immunity reactions, immunological reactions.

Reviriego-Gordejo, F.J.; Vermeersch, J.P. **Towards eradication of bovine tuberculosis in the European Union. An update on bovine tuberculosis programmes in Latin American and Caribbean countries.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 101-109. ISSN: 0378-1135. Note: Paper presented at the *4th International Conference on Mycobacterium bovis, Held August 22-26, 2005, Dublin, Ireland*.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** This paper reviews the developments and progress towards eradication of bovine tuberculosis in the European Union (EU). A historical view of the EU legislation aimed at mainly approximating provisions on intra-community in cattle trade explains the present EU policies. The variety of cattle breeding systems and environmental conditions in the EU leads to different epidemiological situations. The current situation of bovine tuberculosis in the EU Member States is summarized, and current policy in the EU is outlined.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, international trade, disease control, disease control programs, quarantine, literature reviews, European Union, epidemiology, agricultural policy, pathogen eradication, Europe.

Reynolds, D. **TB policy developments.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 5-10. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle, *Mycobacterium bovis*, badgers (*Meles meles*), eradication and control programs, lessons learned, disease distribution, zoonotic infections, UK.

Reynolds, D. **A review of tuberculosis science and policy in Great Britain.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 119-126. ISSN: 0378-1135. Note: Paper presented at the *4th International Conference on Mycobacterium bovis, Held August 22-26, 2005, Dublin, Ireland*.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** Bovine tuberculosis is one of the most complex animal health problems that the farming industry in Great Britain faces today. In leading and facilitating the changes to policy required to reverse the long-term upward trend in

the disease, Government is heavily reliant on evidence emerging from its wide-ranging bovine tuberculosis research programme. The paper outlines development of policy in Great Britain and its relationship to research findings.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, disease control, disease control programs, literature reviews, disease incidence, disease outbreaks, agricultural research, information sources, Great Britain.

Rishendra Verma; Samir Das. **Zoonotic tuberculosis due to *Mycobacterium bovis* in India.** *Intas Polivet.* 2006; 7 (2): 227-235. ISSN: 0972-1738

**Descriptors:** zoonotic tuberculosis, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, economic losses, humans, animals, wildlife, diagnosis, clinical picture, antibiotic treatment, disease surveillance, zoonotic infections, India.

Romero, B.; Bezos, J.; Alvarez, J.; Aranaz, A.; Juan, L. de; Lozano, F.; Mateos, A.; Dominguez, L.; Travnicek, M. **Bovinná tuberkulóza v EU - prítomnosť a budúcnosť. [Bovine tuberculosis in EU - the presence and future.]** *Slovenský Veterinársky Casopis.* 2006; 31 (3): 165-168. ISSN: 1335-0099. Note: In Slovakian.

**Descriptors:** cattle, *Mycobacterium bovis*, Common Market, EC; EEC; European Communities, European Economic Communities.

Romero-Tejeda, Aurora; Arriaga-Diaz, Camila; Guevara-Vivero, Jesus; Garcia-Salazar, Jose Alfredo; Torres-Leon, Ruben Arturo; Estrada-Chavez, Ciro. **Confirmación de la excreción de *Mycobacterium bovis* en exudados nasales mediante PCR anidada en un hato lechero. [Confirmation of *Mycobacterium bovis* excretion in nasal exudates using nested PCR in a dairy cattle herd.]** *Veterinaria Mexico.* 2006; 37(1): 137-143. ISSN: 0301-5092. Note: In Spanish.

**NAL Call Number:** SF604.V485

**Descriptors:** dairy cattle, disease transmission, *Mycobacterium bovis*, respiratory excretion of bacteria and relationship with immune response, nasal exudates analyzed, nested PCR, IFN gamma.

Rosseels, Valerie; Marche, Sylvie; Roupie, Virginie; Govaerts, Marc; Godfroid, Jacques; Walravens, Karl; Huygen, Kris. **Members of the 30- to 32-kilodalton mycolyl transferase family (Ag85) from culture filtrate of *Mycobacterium avium* subsp. *paratuberculosis* are immunodominant Th1-type antigens recognized early upon infection in mice and cattle.** *Infection and Immunity.* 2006 Jan; 74 (1): 202-212. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The characterization of protective antigens is essential for the development of an effective, subunit-based vaccine against paratuberculosis. Surface-exposed and secreted antigens, present abundantly in mycobacterial culture filtrate (CF), are among the well-known protective antigens of *Mycobacterium tuberculosis* and *Mycobacterium bovis*. Culture filtrate, prepared from *Mycobacterium avium* subsp. *paratuberculosis* ATCC 19698 grown as a surface pellicle on synthetic Sauton medium, was strongly and early recognized in experimentally infected B6 bg/bg beige mice and cattle, as indicated by elevated spleen cell gamma interferon (IFN-[gamma]) secretion and lympho-proliferative responses of peripheral blood mononuclear cells, respectively. Strong proliferative and ex vivo IFN-[gamma] responses against antigen 85 (Ag85) complex (a major protein component from *M. bovis* BCG culture filtrate) could be detected in cattle as early as 10 weeks after oral *M. avium* subsp. *paratuberculosis* infection. Synthetic peptides from the Ag85A and Ag85B components of this complex were strongly recognized, whereas T-cell responses were weaker against peptides from the Ag85C protein. A promiscuous T-cell epitope spanning amino acids 145 to 162 of Ag85B (identical sequence in *M. bovis* and *M. avium* subsp. *paratuberculosis*) was identified in experimentally infected cattle. Finally, young calves, born from cows with confirmed paratuberculosis, demonstrated proliferative responses to purified, recombinant Ag85A and Ag85B from *M. avium* subsp. *paratuberculosis*. These results indicate that the *M. avium* subsp. *paratuberculosis* Ag85 homologues are immunodominant T-cell antigens that are recognized early in experimental and natural infection of cattle.

**Descriptors:** cattle, *Mycobacterium avium paratuberculosis*, *Mycobacterium bovis*, protective antigens, synthetic Sauton medium, cultural filtrate, experimental infections, B6 bg/bg beige mice, cattle, elevated spleen cell gamma interferon (IFN-[gamma]) secretion, lympho-proliferative responses of peripheral blood mononuclear cells, Ag85 homologues.

Rua-Domenech, R. de la; Goodchild, T.; Vordermeier, M.; Clifton-Hadley, R. **Ante mortem diagnosis of bovine tuberculosis: the significance of unconfirmed test reactors.** *GVJ-Government Veterinary Journal.* 2006; 16 (1): 65-

71. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle, *Mycobacterium bovis*, diagnostic testing, intradermal tests, test reactors, zoonotic diseases.

Rua-Domenech, R.de la. **Bovine tuberculosis in the European Union and other countries: current status, control programmes and constraints to eradication.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 19-45. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle, *Mycobacterium bovis*, disease levels and distribution, zoonotic infections, control programs, issues limiting eradication, EC, USA, Africa, Canada, New Zealand, EU.

Rua-Domenech, R. de la; Goodchild, A.T.; Vordermeier, H.M.; Hewinson, R.G.; Christiansen, K. H.; Clifton-Hadley, R.S. **Ante mortem diagnosis of tuberculosis in cattle: a review of the tuberculin tests, gamma-interferon assay and other ancillary diagnostic techniques.** *Research in Veterinary Science*. 2006; 81 (2): 190-210. ISSN: 0034-5288

**URL:** <http://www.sciencedirect.com/science/journal/00345288>

**NAL Call Number:** 41.8 R312

**Descriptors:** cattle, *Mycobacterium bovis*, diagnostic testing, live animals, cellular immunity tests, humoral antibody immunity tests, *Mycobacterium bovis*, PCR probes, electronic nose technology, sensitivity and specificity issues, eradication by culling skin reactors.

Rudolph, B.A.; Riley, S.J.; Hickling, G.J.; Frawley, B.J.; Garner, M.S.; Winterstein, S.R. **Regulating hunter baiting for white-tailed deer in Michigan: biological and social considerations.** *Wildlife Society Bulletin*. 2006; 34 (2): 314-321. ISSN: 0091-7648

**URL:** [http://joomla.wildlife.org/index.php?option=com\\_content&task=view&id=186&Itemid=248](http://joomla.wildlife.org/index.php?option=com_content&task=view&id=186&Itemid=248)

**NAL Call Number:** SK357.A1W5

**Abstract:** Eradication of bovine tuberculosis (TB) from free-ranging white-tailed deer (*Odocoileus virginianus*) requires mortality rates of infected deer exceed the rate of new infection. Efforts to reduce TB transmission in Michigan, USA, are based on 2 assumptions: (1) deer mortality may be increased through recreational hunting and (2) encounter rates between infected and noninfected deer may be reduced by prohibiting baiting and supplemental feeding. Spatial correlation of TB-infected deer and supplemental feeding sites detected using aerial surveys validated a ban on artificial feeding in Michigan. Similar analysis could not be used to evaluate the effects of a baiting ban because bait distribution was unknown. Furthermore, a ban on deer baiting could confound attempts to increase deer mortality through reduced hunter participation or efficacy. We reviewed the process used to evaluate a strategy for regulating bait use by hunters. This review included an assessment of 5 factors: statewide spatial analysis of apparent TB prevalence, deer intraspecific interactions at bait sites, effects of bait on hunter harvest rates, impacts of disease presence and practice of eradication efforts on hunting participation in the infected area and input from law enforcement personnel. Our analysis suggested that restricting baiting to a limited, consistent region incurred less biological risk than allowing bait to be used statewide and less political risk than a statewide ban.

**Descriptors:** cattle, white tailed deer (*Odocoileus virginianus*), *Mycobacterium bovis*, feeding wild white tailed deer, transmission of disease, death rates, intraspecific interactions at bait sites, restricting baiting to a consistent region, feeding regulations, Michigan, USA.

Ryan, T.J.; Livingstone, P.G.; Ramsey, D.S.L.; de Lisle, G.W.; Nugent, G.; Collins, D.M.; Buddle, B.M. **Advances in understanding disease epidemiology and implications for control and eradication of tuberculosis in livestock: the experience from New Zealand.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 211-219. ISSN: 0378-1135.

Note: Paper presented at the *4th International Conference on Mycobacterium bovis, Held August 22-26, 2005, Dublin, Ireland*.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** A deteriorating tuberculosis problem in cattle and deer in New Zealand has been halted and then reversed over the last decade. *Mycobacterium bovis* infection in both wild and domestic animal populations has been controlled. This has been achieved by applying a multi-faceted science-based program. Key features of this have been a comprehensive understanding of the epidemiology of tuberculosis in animals, confidence in sampling wild animal populations, effective application of diagnostic tests in cattle and deer, and the ability to map *M. bovis* genotypes.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control, disease control programs, deer, wildlife, animal diseases, tuberculosis, disease transmission, disease surveillance, diagnostic techniques, disease diagnosis, genotype, microbial genetics, strains, strain differences, pathogen eradication, serodiagnosis, New Zealand.

Sarma, K.K.; Bhawal, A.; Yadav, V.K.; Saikia, G.; Jogiraj Das. **Investigation of tuberculosis in captive Asian elephants of Assam vis-a-vis its cross infections with the handlers.** *Intas Polivet.* 2006; 7 (2): 269-274. ISSN: 0972-1738

**Descriptors:** *Elephas maximus*, disease screening, serum testing, indirect hemagglutination test (IHA), *Mycobacterium*, chemotherapy, clinical picture, disease surveillance, isonicotinic acid hydrazide, zoonotic infections, cross infection with human handlers, antibiotic treatment, isoniazid, streptomycin, Assam, India.

Scantlebury, M.; Harris, S.; Allcroft, D.J.; Hutchings, M.R. **Individual trade-offs between nutrition and risk of interspecific transmission of disease by grazing: cows, badger latrines and bovine tuberculosis.** *Behaviour.* 2006; 143 (2): 141-158.

**URL:** [www.brill.nl](http://www.brill.nl)

**Descriptors:** bovine-tuberculosis, badgers (*Meles meles*), cattle, *Mycobacterium bovis*, cattle behaviors, dairy cows, use of pastures, correlations with physiological states, disease transmission from pastures, badger excreta, milk levels, differences in cattle behavior with just badger urine alone, disease risks, UK.

Scott-Park, F.; Biggs, A. **Premovement testing for bovine TB.** *Veterinary Record* (London) . 2006; 158 (16): 571. ISSN: 0042-4900. Note: Correspondence.

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, *Mycobacterium bovis*, predicting bovine TB movement, England, UK.

Semret, M.; Bakker, D.; Smart, N.; Olsen, I.; Haslov, K.; Behr, M.A. **Genetic analysis of *Mycobacterium avium* complex strains used for producing purified protein derivatives.** *Clinical and Vaccine Immunology.* 2006; 13 (9): 991-996. ISSN: 1556-6811

**URL:** <http://cvi.asm.org/>

**Abstract:** For over a century, purified protein derivatives (PPD) have been used to detect mycobacterial infections in humans and livestock. Among these, reagents to detect infections by *Mycobacterium avium* complex organisms have been produced, but the utility of these reagents has not been clearly established due in part to limited biologic and immunologic standardization. Because there is little information about the strains used to produce these reagents (*avian* PPD, *intracellulare* PPD, *scrofulaceum* PPD, and *Johnin*), we have performed genetic characterizations of strains used to produce these products. Sequence analysis of 16S rRNA and the hsp65 gene provided results concordant with species designations provided for *M. avium*, *Mycobacterium intracellulare*, and *Mycobacterium scrofulaceum* organisms. For *M. avium* strains, comparative genomic hybridization was performed on a whole-genome DNA microarray, revealing one novel 7.9-kilobase genomic deletion in certain Johnin-producing strains, in addition to genomic variability inherent to the particular *M. avium* subspecies. Our findings indicate that considerable genomic differences exist between organisms used for reagents and the infecting organism being studied. These results serve as a baseline for potency studies of different preparations and should aid in comparative studies of newly discovered antigens for the diagnosis of infection and disease by *M. avium* complex organisms.

**Descriptors:** humans, livestock, diagnostic testing, genetic characterizations of strains used for PPD, *Mycobacterium avium*, *Mycobacterium intracellulare*.

Shitaye, J. E.; Getahun, B.; Alemayehu, T.; Skoric, M.; Trembl, F.; Fictum, P.; Vrbas, V.; Pavlik, I. **A prevalence study of bovine tuberculosis by using abattoir meat inspection and tuberculin skin testing data, histopathological and IS6110 PCR examination of tissues with tuberculous lesions in cattle in Ethiopia.** *Veterinarni Medicina.* 2006; 51 (11): 512-522.

**URL:** <http://www.vri.cz/docs/vetmed/51-11-512.pdf>

**NAL Call Number:** 41.9 C333

**Descriptors:** cattle, goats, sheep, *Mycobacterium bovis*, 10 year study, trends, tubercular lesions, abattoirs, prevalence levels, Addis Abba, Debre Zeit, Ethiopia.

Shitaye, J.E.; Parmova, I.; Matlova, L.; Dvorska, L.; Horvathova, A.; Vrbas, V.; Pavlik, I. **Mycobacterial and *Rhodococcus equi* infections in pigs in the Czech Republic between the years 1996 and 2004: the causal factors and distribution of infections in the tissues.** *Veterinarni Medicina*. 2006; 51(11): 497-511

**URL:** <http://www.vri.cz/docs/vetmed/51-11-497.pdf>

**Descriptors:** pigs, tuberculous/tuberculoid lesions, distribution of mycobacterial species and *Rhodococcus equi* in tissues, 3630 slaughtered pigs, microscopic examination and in vitro culture, various organ tissue sampled, gross lesions percentages, disease levels, Czech.

Silva, P.E.G. da; Pinheiro, S.R.; Leal, M.L.do R.; Bertagnon, H.G.; Motta, P.M.P.C.; Sinhorini, I.L.; Vasconcellos, S.A.; Benesi, F.J. **Teste de tuberculinizacao em caprinos (*Capra hircus*) experimentalmente sensibilizados. [Tuberculin test in experimentally sensitized goats (*Capra hircus*)].** *Ciencia Rural*. 2006; 36 (3): 880-886. ISSN: 0103-8478. Note: In Portuguese with an English summary.

**URL:** [http://www.scielo.br/scielo.php/script\\_sci\\_serial/pid\\_0103-8478/lng\\_en/nrm\\_iso](http://www.scielo.br/scielo.php/script_sci_serial/pid_0103-8478/lng_en/nrm_iso)

**NAL Call Number:** S192.R4

**Descriptors:** experimentally infected goats, tuberculin skin test, 3 test groups, sensitized with *Mycobacterium avium* sample D4, sensitized with *Mycobacterium bovis* sample AN5, saline inoculation control, sample cervical test, diagnostic techniques, skin fold thickness, mononuclear inflammatory infiltrates.

Simion, N. **The evolution of bovine tuberculosis incidence in Romania, in the period 2001-2005.** *Slovenian Veterinary Research*. 2006; 43(Supplement 10): 292. Note: Conference proceedings. Edited by B. Zemljic. 7th Middle European Buiatric Congress, Radenci, Slovenia, 29 March-1 April 2006. *Veterinarska Fakulteta, Univerza v Ljubljani, Slovenia*.

**Descriptors:** cattle, animal health surveillance, zoonotic diseases, tuberculosis, *Mycobacterium bovis*, bovine enzootic leucosis, bovine leukemia virus, disease incidence, disease prevalence, disease eradication, epidemiology, Romania.

Singh, A.S.; Pal, D.T. **Nutritional status of crossbred cows suffering from mastitis, metritis and tuberculosis.** *Indian Veterinary Journal*. 2006; 83 (7): 748-751. ISSN: 0019-6479

**URL:** [www.indvetjournal.com](http://www.indvetjournal.com)

**NAL Call Number:** 41.8 IN2

**Descriptors:** cattle, crossbred cows, *Mycobacterium tuberculosis*, mastitis, metritis, tuberculosis, nutritional status of diseased animals vs healthy animals, therapeutic nutrition of sick animals.

Singh, J.P.N.; Rishendra Verma; Chaudhuri, P. **Random amplified polymorphic DNA (RAPD) analysis of *Mycobacterium bovis* strain in India.** *Indian Journal of Animal Sciences*. 2006; 76 (11): 873-877. ISSN: 0367-8318

**NAL Call Number:** 41.8 IN22

**Descriptors:** buffalo, cattle, deer, *Mycobacterium bovis* AN5, *M. bovis* BCG, 20 field isolates, strain typing, RAPD-PCR, polymorphic amplicons, genetic defects, hereditary defects, heterogeneity, India.

Smith, G.C. **Persistence of disease in territorial animals: insights from spatial models of Tb.** *New Zealand Journal of Ecology*. 2006; 30 (1): 35-41. ISSN: 0110-6465

**NAL Call Number:** QH540.N43

**Descriptors:** cattle, bovine tuberculosis, wildlife disease transmission, disease, modeling factors, chance, model artifacts, population (e.g. demographic, genetic) heterogeneity, environmental heterogeneity.

Soares-Magalhaes, R.; Smith, N.H.; Dale, J.; Gover, K.; Mitchell, A.; Mawdsley, J.; Stoker, N.G. **Investigating the cluster of *Mycobacterium bovis* spoligotype 13 strains in the southeast of England.** *Society for Veterinary Epidemiology and Preventive Medicine Proceedings of a Meeting Held at Exeter, UK, 29-31 March 2006*. 2006: 215-227. ISBN: 0948073748

**Descriptors:** cattle, badgers (*Meles meles*), high concentration of bovine tuberculosis, *Mycobacterium bovis* isolates, clonal relationships, spoligotype 13, cluster analysis, wildlife as disease reservoirs, East Sussex county England.

Swai, E.S.; Shirima, G.; Bwanga, S.; Moshly, W. **Bovine tuberculosis survey in urban and peri urban dairy farms in coastal humid region of Tanga, Tanzania.** *Bulletin of Animal Health and Production in Africa*. 2006; 54 (1): 75-78. ISSN: 0378-9721

**NAL Call Number:** 41.8 B872

**Descriptors:** dairy cattle, *Mycobacterium bovis*, disease surveillance, intradermal comparative tuberculin test, disease prevalence, Tanzania, Tanganyika.

Sweeney, F.P.; Courtenay, O.; Ul Hassan, A.; Hibberd, V.; Reilly, L.A.; Wellington, E.M.H. **Immunomagnetic recovery of *Mycobacterium bovis* from naturally infected environmental samples.** *Letters in Applied Microbiology*. 2006; 43 (4): 364-369. ISSN: 0266-8254

**URL:** <http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=lam>

**Descriptors:** cattle, environmental sampling for *Mycobacterium bovis*, *Mycobacterium bovis* BCG, seeded and naturally occurring soil, feces, urine, immunomagnetic capture technique, epidemiological importance of organism in the environment, bovine tuberculosis persistence.

Tadayon, K.; Mosavari, N.; Shahmoradi, A.H.; Sadeghi, F.; Azarvandi, A.; Forbes, K. **The epidemiology of *Mycobacterium bovis* in buffalo in Iran.** *Journal of Veterinary Medicine B*. 2006 Dec; 53 (1): 41-42. ISSN: 0931-1793

**URL:** <http://www3.interscience.wiley.com/journal/118573245/abstract>

**NAL Call Number:** 41.8 Z52

**Abstract:** *Mycobacterium bovis* is the cause of bovine tuberculosis (bovine Tb) in animals and is considered to be zoonotic and accordingly it infects humans, although cattle are the main host. Buffalo can also be infected and develop bovine Tb. In Iran, almost half a million buffaloes are farmed, mainly in three provinces. In West Azerbaijan, which has the largest numbers of buffaloes, cattle and buffalo are often farmed together. According to the reports of the Iranian Veterinary Organization over the last 25 years, there have been no reports of bovine Tb in buffalo, although the disease is often reported in cattle in this province. Eighteen and 140 pathology specimens from cattle and buffalo, respectively, collected from West Azerbaijani abattoirs were cultured. From one buffalo specimen out of 140, *M. bovis* was recovered, whereas the pathogen was isolated from 13 cattle specimens. Spoligotyping showed a relatively higher polymorphism within these isolates compared with *M. bovis* isolated from other Iranian provinces.

**Descriptors:** *Mycobacterium bovis*, cattle, buffalo, epidemiology of the disease, post slaughter survey, West Azerbaijan, Iran.

Tanwar, R.K. **Pulmonary tuberculosis in camels (*Camelus dromedarius*).** *Veterinary Practitioner*. 2006; 7 (1): 17-18. ISSN: 0972-4036

**Descriptors:** dromedary camels, *Mycobacterium*, tuberculosis, clinical picture, lung effects, treatment, NSAIDS, sulfamethazine, sulphadimidine, terramycin, Rajasthan, India.

Taylor, C.; Jahans, K.; Palmer, S.; Okker, M.; Brown, J.; Steer, K. ***Mycobacterium microti* isolated from two pigs.** *Veterinary Record* (London). 2006; 159 (2): 59-60. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** 8 month old, sand and black cross bred pigs, *Mycobacterium microti* UK type 19, *Mycobacterium microti*, vole tuberculosis, case report, clinical picture, granuloma lesions, submandibular lymph nodes, multiple PCR, tuberculosis complex, spoligotyping, west Wales, UK.

Thoen, Charles O.; Steele, James H.; Gilsdorf, Michael J. ***Mycobacterium bovis* infection in animals and humans. 2nd ed.** Ames, Iowa: Blackwell Pub. 2006. 329 p.: ill., maps. ISBN: 0813809193 (alk. paper)

**URL:** <http://catdir.loc.gov/catdir/toc/ecip0515/2005018463.html>

**NAL Call Number:** RC311.19 .M93 2006

**Descriptors:** tuberculosis in cattle. *Mycobacterium bovis*, AIDS disease complications.

Thoen, C.; LoBue, P.; Kantor, I. de. **The importance of *Mycobacterium bovis* as a zoonosis.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 339-345. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** *Mycobacterium bovis* and closely associated acid-fast bacilli cause disease in humans. Epidemiologic investigations reveal that the organism may be ingested or inhaled. Extra pulmonary lesions may occur associated to the consumption of infected milk, even though with the practice of boiling milk, and the growth of milk pasteurization

plants all over the world, the digestive route of infection became less important. On the other hand, airborne infection continues to occur among meat industry and slaughterhouse workers, in regions where the infection is still prevalent in cattle. Evidence of person to person transmission is rare. Main causes of concern related to *M. bovis* in industrialized countries are: epizootics in domesticated and wild mammals and latent infection in immigrants. Although multi-drug-resistant (MDR) strains of *M. bovis* have been identified, case reports reveal that anti-tuberculosis drugs routinely used to treat *Mycobacterium tuberculosis*-infected patients are effective when properly administered.

**Descriptors:** cattle, food animals, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, zoonoses, humans, tuberculosis, disease transmission, lesions animal, health hazards, occupational health and safety, livestock and meat industry, slaughterhouses, disease outbreaks, wild animals, latent period, multiple drug resistance, asymptomatic infections.

Thom, M.L.; Hope, J.C.; McAulay, M.; Villarreal-Ramos, B.; Coffey, T.J.; Stephens, S.; Vordermeier, H.M.; Howard, C.J. **The effect of tuberculin testing on the development of cell-mediated immune responses during *Mycobacterium bovis* infection.** *Veterinary Immunology and Immunopathology*. 2006 Nov 15; 114 (1-2): 25-36.

ISSN 0165-2427

**URL:** <http://dx.doi.org/10.1016/j.vetimm.2006.07.001>

**NAL Call Number:** SF757.2.V38

**Abstract:** Protection against tuberculosis (TB) is associated with Th1-type cell-mediated immunity (CMI). Whilst the intradermal injection of partially purified derivatives of tuberculin (PPD) represents the classic test assessing the delayed type hypersensitivity (DTH) response used in both humans and cattle for diagnosing TB, it has been suggested that the test may modulate host CMI responses. To investigate the kinetics of the development of the DTH response and its subsequent effect on CMI responses, groups of 6-month old calves were inoculated intranasally with  $8 \times 10^4$  cfu of *Mycobacterium bovis*, subjected to the comparative intradermal tuberculin test (TT) using bovine and avian PPD (PPD-B, PPD-A) at various time intervals post-infection, and immune responses compared. These included DTH, lymphocyte proliferation, IgG production, and synthesis of the cytokines: IFN(Sd(B, IL-10, IL-4, IL-6, and IL-13. All animals were subjected to post-mortem examination. The kinetics of the development of the DTH response assessed in the TT was such that infected cattle could be identified as early as 3 weeks post-infection, which correlated with the detection of an antigen-specific IFN(Sd(B response. Transient increases in plasma-derived IFN(Sd(B as a result of TT during an established TB infection were more pronounced when blood was stimulated with PPD-A compared with PPD-B stimulation. This has the potential to mask diagnosis of infection as a result of the stronger avian-bias if the IFN(Sd(B test is used the week following TT. Disease pathology was not affected by TT. A transient failure to a second TT was observed in 1 of 30 animals and the time (post-infection) at which the TT is administered may be of significance. In serum, IgG responses to PPD-B, which were undetectable prior to TT, were elevated after TT and were most pronounced in cattle that were TT at 6 weeks post-infection. Other cytokines were also affected by the TT; IL-4 mRNA levels increased and IL-6 mRNA levels decreased, whilst PPD-B specific IL-10 protein synthesis was enhanced. These observations may offer the potential for further diagnostic assays that could complement the TT and IFN(Sd(B test.

**Descriptors:** 6 month old calves, intranasal inoculation, *Mycobacterium bovis*, cell mediated immunity, intradermal immunity testing, IFN (Sd(B, cytokines, IL-4mRNA levels increased, IL6 mRNA decreased, PPD-B specific IL-10 protein synthesis enhanced, diagnostic assays.

Twomey, D.F.; Crawshaw, T.R.; Anscombe, J.E.; Farrant, L.; Evans, L.J.; McElligott, W.S.; Higgins, R.J.; Dean, G.; Vordermeier, M.; Jahans, K.; Rua-Domenech, R. de la. **TB in llamas caused by *Mycobacterium bovis*.** *Veterinary Record*. 2007; 160 (5): 170. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/archive/>

**NAL Call Number:** 41.8 V641

**Descriptors:** llama herd, diagnosis of tuberculosis, *Mycobacterium bovis*, seroprevalence, antibody tests, intradermal tuberculin test, Devon, UK.

UK Department for Environment Food and Rural Affairs. **Special Issue: Bovine TB.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 91 pp. ISSN: 0269-5545. Note: Special issue contains 10 articles on TB.

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle, other species, *Mycobacterium bovis*, TB disease levels and distribution, TB policies, disease modeling, Bovigam assay, antemortem diagnosis, tuberculin skin test, zoonotic infections, control programs, issues

limiting eradication, EC, USA, Africa, Canada, New Zealand, EU.

Vazquez-Flores, Felicitas; Alonso, Rogelio; Villegas-Sepulveda, Nicolas; Arriaga, Camila; Pereira-Suarez, Ana Laura; Mancilla, Raul; Estrada-Chavez, Ciro. **A microsatellite study of bovine solute carrier family 11 a1 (*Slc11a1*) gene diversity in Mexico in relation to bovine tuberculosis.** *Genetics and Molecular Biology*. 2006; 29 (3): 503-507.

ISSN:

**NAL Call Number:** QH426.R48

**Descriptors:** cattle, *Mycobacterium bovis*, genetic susceptibility, polymorphisms, surveyed 34 European, 18 Asian, 20 Creole and 23 hybrid bovines, bovine solute carrier family 11 a1 (*Slc11a1*) gene, two microsatellite loci closely linked to this gene, levels of heterozygosity, 3' UTR microsatellite locus.

Vengust, G.; Zele, D. **Nekatere infekcijske bolezni pri jelenjadi v oborah s poudarkom na zoonozah.** [Some infectious diseases of deer in enclosures with emphasis on zoonosis.] *Veterinarske Novice*. 2006; 32 (3/4): 57-62.

ISSN: 0351-5842. Note: In Slovenian with an English summary.

**Descriptors:** fallow deer, red deer, deer farming, levels of disease, clinical signs, diagnosis, treatment and prevention, *Bacillus anthracis*, *Brucella abortus*, *Cervus elaphus*, Herpesviridae, *Leptospira*, *Listeria monocytogenes*, Malignant catarrhal fever virus, *Mycobacterium avium* ssp *paratuberculosis*, *Mycobacterium bovis*, *Salmonella*, *Yersinia pseudotuberculosis*, Slovenia.

Vitale, Fabrizio; Reale, Stefano; Petrotta, Enrico; Caracappa, Santo; Barera, Annalisa; La Manna, Marco Pio; Macaluso, Pasquale; Caccamo, Nadia; Dieli, Francesco; Vordermeier, Hans Martin; Sireci, Guido; Salerno, Alfredo. **ESAT-6 peptide recognition by bovine CD8(+) lymphocytes of naturally infected cows in herds from southern Italy.**

*Clinical and Vaccine Immunology*. 2006; 13 (4): 530-533. ISSN:

**URL:** <http://cvi.asm.org/>

**NAL Call Number:** RB46.5

**Descriptors:** define epitopes of *Mycobacterium bovis* from ESAT-6 (early secretory antigen of 6 kDa) recognized by CD8(+) T lymphocytes from cows naturally infected with *Mycobacterium bovis*, bovine CD8' T cells recognized 10 out of 11 ESAT-6 peptides tested.

Vordermeier, H.M.; Chambers, M.A.; Buddle, B.M.; Pollock, J.M.; Hewinson, R.G. **Progress in the development of vaccines and diagnostic reagents to control tuberculosis in cattle.** *Veterinary Journal*. 2006 Mar; 171 (2): 229-244. ISSN: 1090-0233

**URL:** <http://dx.doi.org/10.1016/j.tvjl.2004.11.001>

**NAL Call Number:** SF601.V484

**Abstract:** The sharp rise of bovine tuberculosis (TB) in Great Britain and the continuing problem of wild life reservoirs in countries such as New Zealand and Great Britain have resulted in increased research efforts into the disease. Two of the goals of this research are to develop (1) cattle vaccines against TB and (2) associated diagnostic reagents that can differentiate between vaccinated and infected animals (differential diagnosis). This review summarises recent progress and describes efforts to increase the protective efficacy of the only potential TB vaccine currently available, *Mycobacterium bovis* BCG, and to develop specific reagents for differential diagnosis. Vaccination strategies based on DNA or protein subunit vaccination, vaccination with live viral vectors as well as heterologous prime-boost scenarios are discussed. In addition, we outline results from studies aimed at developing diagnostic reagents to allow the distinction of vaccinated from infected animals, for example antigens that are not expressed by vaccines like *Mycobacterium bovis* Bacille-Calmette-Guerin, but recognised strongly in *Mycobacterium bovis* infected cattle.

**Descriptors:** cattle, bovine tuberculosis, *Mycoplasma bovis*, drugs, vaccine development, literature reviews, *Mycobacterium bovis* BCG, BCG vaccine, live vaccines, subunit vaccines, disease detection, analytical methods, reagents, laboratory techniques, immunologic techniques, serodiagnosis, *Mycobacterium tuberculosis* complex.

Vordermeier, H. Martin; Huygen, Kris; Singh, Mahavir; Hewinson, R. Glyn; Xing, Zhou. **Immune responses induced in cattle by vaccination with a recombinant adenovirus expressing mycobacterial antigen 85A and *Mycobacterium bovis* BCG.** *Infection and Immunity*. 2006 Feb.; 74 (2) 1416-1418. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** Cattle were vaccinated with an adenovirus expressing the mycobacterial antigen 85A (rAd85A), with *Mycobacterium bovis* BCG followed by rAd85A heterologous boosting, or with rAd85A followed by BCG boosting,

BCG/rAd85A resulted in the highest direct gamma interferon responses. Cultured enzyme-linked immunospot assay analysis demonstrated that memory responses were induced by all three protocols but were strongest after BCG/rAd85A and rAd85A/BCG vaccination.

**Descriptors:** cattle, *Mycobacterium bovis* BCG, vaccination, adenovirus expressing mycobacterial antigen 85A (rAd85A), 3 protocols, immune response.

Walravens, K.; Allix, C.; Supply, P.; Rigouts, L.; Godfroid, J.; Govaerts, M.; Portaels, F.; Dufey, J.; Vanholme, L.; Fauville-Dufaux, M.; Saegerman, C. **Dix années d'épidémiologie moléculaire de la tuberculose bovine en Belgique. [Ten years of molecular epidemiology of bovine tuberculosis in Belgium.]** *Epidemiologie et Sante Animale*. 2006; (49): 103-111. ISSN: 0754-2186. Note: In French with an English summary.

**Descriptors:** cattle, *Mycobacterium bovis*, control and eradication programs, infections sporadic, 10 years of epidemiological data, Belgium.

Ward, A.I.; Tolhurst, B.A.; Delahay, R.J. **Farm husbandry and the risks of disease transmission between wild and domestic mammals: a brief review focusing on bovine tuberculosis in badgers and cattle.** *Animal Science* (Penicuik). 2006; 82 (Part 6): 767-773. ISSN: 1357-7298.

**URL:** <http://journals.cambridge.org/action/displayJournal?jid=ASC>

**Descriptors:** wildlife as disease reservoirs, mammals, domesticated animals, disease transmission, European badgers (*Meles meles*), brushtail possums (*Trichosurus vulpecula*), culling strategies, changing livestock husbandry, farm management, *Mycobacterium bovis*, UK.

Waters, W.R.; Palmer, M.V.; Thacker, T.C.; Bannantine, J.P.; Vordermeier, H.M.; Hewinson, R.G.; Greenwald, R.; Esfandiari, J.; McNair, J.; Pollock, J.M.; Andersen, P.; Lyashchenko, K.P. **Early antibody responses to experimental *Mycobacterium bovis* infection of cattle.** *Clinical and Vaccine Immunology*. 2006; 13 (6): 648-654. ISSN: 1556-6811 (print). ISSN: 1556-679X (on line)

**URL:** <http://cvi.asm.org/>

**NAL Call Number:** RB46.5

**Descriptors:** *Mycobacterium bovis*, zoonotic disease, infected cattle sampling, seroreactivity to mycobacterial antigens, experimental infection, various inoculation methods, aerosol, intratracheal, intranasal, multiantigen print immunoassay of antigen recognition patterns, immunoblot analysis for sensitive kinetic studies, VetTB STAT-PAK test based on lateral flow technology, MPB83, ESAT-6, CFP-10, and MPB70, rapidity of immune responses, potential of new antibody-based testing.

Waters, W.R.; Palmer, M.V.; Thacker, T.C.; Payeur, J.B.; Harris, N.B.; Minion, F.C. Greenwald, R.; Esfandiari, J.; Andersen, P.; McNair, J.; Pollock, J.M.; Lyashchenko, K.P. **Immune responses to defined antigens of *Mycobacterium bovis* in cattle experimentally infected with *Mycobacterium kansasii*.** *Clinical and Vaccine Immunology*. 2006; 13 (6): 611-619. ISSN: 1556-6811

**URL:** <http://cvi.asm.org/>

**NAL Call Number:** RB46.5

**Descriptors:** calves, cross reactivity responses, *Mycobacterium bovis*, *Mycobacterium kansasii*, specificity of diagnostic tests, responses of calves shows responses that can confound testing for *M. bovis*.

Watrelet-Virieux, D.; Drevon-Gaillot, E.; Toussaint, Y.; Belli, P. **Comparison of three diagnostic detection methods for tuberculosis in French cattle.** *Journal of Veterinary Medicine B*. 2006; 53 (7): 321-325. ISSN: 0931-1793

**URL:** <http://www3.interscience.wiley.com/journal/118573200/abstract>

**NAL Call Number:** 41.8 Z52

**Abstract:** Three additional techniques (Ziehl-Neelsen, auramine O/rhodamine and immunostaining using polyclonal anti-*Mycobacterium bovis*) to hematoxylin-eosin histopathology were evaluated for bovine tuberculosis diagnosis on 39 samples from several slaughterhouses. The immunohistochemical technique was more sensitive and could detect a greater number of positive cattle. It has about the same sensibility as the bacteriology but it was faster.

**Descriptors:** French cattle, slaughtered animals, *Mycobacterium bovis*, pathogen detection methods, comparison study, France.

Werling, D.; Piercy, J.; Coffey, T.J. **Expression of TOLL-like receptors (TLR) by bovine antigen-presenting cells - potential role in pathogen discrimination?** *Veterinary Immunology and Immunopathology*. 2006; 112 (1/2): 2-11.

ISSN: 0165-2427

URL: <http://www.sciencedirect.com/science/journal/01652427>

NAL Call Number: SF757.2.V38

**Descriptors:** cattle, *Mycobacterium*, antigenicity, immunogens, B and T lymphocytes, cellular defense mechanisms, immunity reactions, immunological reactions, mRNA, T cells, TOLL-like receptors (TLR), pathogen-associated molecular patterns, TLR2 in host defense against mycobacteria, mycobacteria species-specific response to bovine macrophages.

Winder, C.L.; Gordon, S.V.; Dale, J; Hewinson, R.G.; Goodacre, R. **Metabolic fingerprints of *Mycobacterium bovis* cluster with molecular type: implications for genotype-phenotype links.** *Microbiology* (Reading). 2006; 152 (9): 2757-2765. ISSN: 1350-0872

URL: <http://mic.sgmjournals.org>

**Descriptors:** cattle, *Mycobacterium bovis*, bovine tuberculosis, tracing reservoirs of infection, Fourier-transform infrared spectroscopy (FT-IR), rapid phenotypic typing technique, multivariate cluster analysis, spoligotypes, genotype systematics, Britain, United Kingdom.

Widdison, S.; Schreuder, L.J.; Villarreal-Ramos, B.; Howard, C.J.; Watson, M.; Coffey, T.J. **Cytokine expression profiles of bovine lymph nodes: effects of *Mycobacterium bovis* infection and bacille Calmette-Guerin vaccination.** *Clinical and Experimental Immunology*. 2006; 144 (2): 281-289. ISSN: 0009-9104

URL: <http://www.blackwellpublishing.com/journal.asp?ref=0009-9104>

NAL Call Number: QR180.C5

**Descriptors:** cattle, experimental infection, intranasal inoculation, comparison with non-inoculated animals, cytokine expression in lymph nodes, vaccination with *Mycobacterium bovis* BCG, lymph nodes with established tuberculosis and a persisting bacterial infection, maintenance of the pro-inflammatory response in combination with suppressed anti-inflammatory response may control the infection but contribute to host-induced tissue damage.

Woodroffe, R.; Donnelly, C.A.; Cox, D.R.; Bourne, F.J.; Cheeseman, C.L.; Delahay, R.J.; Gettinby, G.; McInerney, J.P.; Morrison, W.I. **Effects of culling on badger *Meles meles* spatial organization: implications for the control of bovine tuberculosis.** *Journal of Applied Ecology*. 2006; 43 (1): 1-10. ISSN: 0021-8901

URL: <http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=jpe>

NAL Call Number: 410.J828II

**Abstract:** The incidence of bovine tuberculosis (TB) in British cattle has risen markedly over the last two decades.

Failure to control the disease in cattle has been linked to the persistence of a reservoir of infection in European badgers *Meles meles*, a nationally protected species. Although badger culling has formed a component of British TB control policy for many years, a recent large-scale randomized field experiment found that TB incidence in cattle was no lower in areas subject to localized badger culling than in nearby areas where no experimental culls occurred. Indeed, analyses indicated that cattle incidence was higher in culled areas. One hypothesis advanced to explain this pattern is that localized culling disrupted badgers' territorial behaviour, potentially increasing the rate of contact between cattle and infected badgers. This study evaluated this hypothesis by investigating badger activity and spatial organization in 13 study areas subjected to different levels of culling. Badger home ranges were mapped by feeding colour-marked baits at badger dens and measuring the geographical area in which colour-marked faeces were retrieved. Badger home ranges were consistently larger in culling areas. Moreover, in areas not subjected to culling, home range sizes increased with proximity to the culling area boundary. Patterns of overlap between home ranges were also influenced by culling. Synthesis and applications. This study demonstrates that culling badgers profoundly alters their spatial organization as well as their population density. These changes have the potential to influence contact rates between cattle and badgers, both where culls occur and on adjoining land. These results may help to explain why localized badger culling appears to have failed to control cattle TB, and should be taken into account in determining what role, if any, badger culling should play in future control strategies..

**Descriptors:** cattle, badgers (*Meles meles*), bovine tuberculosis, culling of wild badger, wild animal disease reservoirs, home ranges, increased contact between badgers and cattle, UK.

## 2005

AAEMA. **Journee AEEMA: 20 Mai 2005. AEEMA Meeting, 20 May 2005.** *Epidemiologie et Sante Animale*. 2005; (48): 144 pp. ISSN: 0754-2186. Note: In French. A conference proceedings of 16 papers on infectious

diseases in livestock.

**Descriptors:** pigs, goats, Piedmont cattle breed, sheep, birds, avian influenza virus, bluetongue virus, bovine diarrhea virus, *Dermanyssus gallinae*, *Lawsonia* bacteria, *Mycobacterium*, rabies virus, *Salmonella*, *Toxoplasma*, *Lawsonia intracellularis*, epidemiology, disease controls, clinical picture, Burgundy, Chad, Corsica, France, Italy, Piedmont, South East Asia, West Africa.

Araujo, C.P. de; Leite, C.Q.F.; Prince, K.A. de; Jorge, K. dos S.G.; Osorio, A.L.A.R. ***Mycobacterium bovis* identification by a molecular method from post-mortem inspected cattle obtained in abattoirs of Mato Grosso do Sul, Brazil.** *Memorias do Instituto Oswaldo Cruz*. 2005; 100 (7): 749-752. ISSN: 0074-0276

**URL:** [http://www.scielo.br/scielo.php/script\\_sci\\_serial/pid\\_0074-0276/Ing\\_en/nrm\\_iso](http://www.scielo.br/scielo.php/script_sci_serial/pid_0074-0276/Ing_en/nrm_iso)

**NAL Call Number:** 448.9 IN74

**Descriptors:** *Mycobacterium bovis*, bovine tuberculosis, post-slaughter testing, meat quality, contaminated meat products, carcasses with lesions, 23.6 % of samples positive for mycobacteria, Ziehl-Neelsen staining, PCR restriction enzyme patterns, 4 isolates identified, Mato Grosso do Sul, Brazil.

Arpan Maheshwari; Rishendra Verma **Evaluation of three antigens by enzyme-linked immunosorbent assay (ELISA) for the detection of *Mycobacterium bovis* infection in Indian cattle for field use.** *Indian Journal of Animal Sciences*. 2005; 75 (4): 401-406. ISSN: 0367-8318

**NAL Call Number:** 41.8 IN22

**Descriptors:** cattle herd testing, sera samples, *Mycobacterium bovis*, diagnosis, detection, purified protein derivative, protein rich soluble extract, species-specific phenolic glycolipid of *Mycobacterium bovis* AN5, antigens, ELISA, India.

Asseldonk, M.A.P.M. van; Roermund, H.J.W. van; Fischer, E.A.J.; Jong, M.C.M. de; Huirne, R.B.M. **Stochastic efficiency analysis of bovine tuberculosis-surveillance programs in the Netherlands.** *Preventive Veterinary Medicine*. 2005; 69 (1/2): 39-52. ISSN: 0167-5877

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503315/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503315/description#description)

**NAL Call Number:** SF601.P7

**Descriptors:** bovine tuberculosis, stochastic bio-economic model, cost efficient surveillance program, epidemiological module, dynamics of detection, probability of detection, visual examination of carcass lesions at slaughter, GAMMA-interferon testing of blood samples, two state tuberculin testing, future may use ELISA testing of bulk tank milk in combination with slaughter examination, Netherlands.

Baird, G. **Caseous lymphadenitis in goats.** *Goat Veterinary Society Journal*. 2005; 21: 21-23. ISSN: 0961-2548

**Descriptors:** goats, caseous lesions, bacterial pathogens found, *Actinobacillus lignieresii*, *Arcanobacterium pyogenes*, *Corynebacterium pseudotuberculosis*, *Mycobacterium*, *Staphylococcus aureus*, *Yersinia pseudotuberculosis*, UK.

Barrett, D.C. **Cattle Review 2005 Parts 41-43.** *Cattle Practice*. 2005; 13 (3): 277-280. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, dairy cows, housing, fertility, semen storage, sperm survival, artificial insemination, estrous cycle, hormones, progesterone, reproduction, embryonic development, dry period in dairy cows, nutrition and energy balance, lactation, mammary glands, lameness, estrous cycle, progesterone, reproduction, bovine tuberculosis, *Mycobacterium bovis*, reviews.

Bernard, F.; Vincent, C.; Matthieu, L.; David, R.; James, D. **Tuberculosis and brucellosis prevalence survey on dairy cattle in Mbarara milk basin (Uganda).** *Preventive Veterinary Medicine*. 2005; 67 (4): 267-281. ISSN: 0167-5877

**URL:** <http://www.sciencedirect.com/science/journal/01675877>

**Descriptors:** dairy cattle, *Brucella*, *Mycobacterium bovis*, 340 herds tested, intradermal skin test, prevalence survey, age differences, sex differences, breed differences, seroprevalence of pathogens, Mbarara, Uganda.

Bernardelli, A.; Nicola, A.; Alonso, B.; Alonso, Z.; Ulens, K.; Morcillo, N.; Cordero, G.; Cataldi, A.; Zumarraga, M.; Paolicchi, F.; Torres, P.; Kistermann, J.C.; Madero, J.E. **Tuberculosis Bovina: evaluacion de tecnicas de diagnostico. [Bovine tuberculosis: evaluation of diagnostic techniques.]** *Revista de Medicina Veterinaria Buenos Aires*. 2005; 86 (5): 183, 194. ISSN: 0325-6391. Note: In Spanish with an English summary.

**Descriptors:** cattle; *Mycobacterium bovis*; diagnostic techniques; sensitivity; specificity; agreement; kappa Bovigam<sup>TM</sup> CSL kit was 88%, 73%, 82% and 0.62; LCx *Mycobacterium tuberculosis* ASSAY-ABBOTT was 28%, 91%, 46% and

0.13; Mycobacterial Growth Indicator Tube system was 0, 100%, 37% and 0; Ziehl-Neelsen stained method it was 1%, 92%, 47% and -0.6; culture in Lowenstein-Jensen was 0, 99%, 51% and -0.12; culture in Stonebrink was 2%, 93%, 51% and -0.5; PCR IS6110 probe in milk samples of 55%, specificity was 96%, agreement was 73% and kappa was 0.49.

Bourne, J.; Donnelly, C.A.; Cox, D.R.; Gettinby, G.; McInerney, J.P.; Morrison, I.; Woodroffe, R. **Bovine tuberculosis: towards a future control strategy.** *Cattle Practice*. 2005; 13 (4): 289-294. ISSN: 0969-1251. Note: Reprinted from *Veterinary Record*. 2003; 167: 207-210.

**NAL Call Number:** SF961.C37

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, pathogenesis, diagnosis, disease prevalence, disease control programs, disease prevention, wildlife as disease reservoirs, disease transmission, UK.

Bourne, J.; Donnelly, C.A.; Cox, D.R.; Gettinby, G.; McInerney, J.P.; Morrison, W.I.; Woodroffe, R. **Bovine tuberculosis - towards a science based control strategy.** *Cattle Practice*. 2005; 13 (4): 319-322. ISSN: 0969-1251. Note: Reprinted from *Science in Parliament*. 2005; 62: 25-28.

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, badgers (*Meles meles*), wild animal disease reservoir, transmission risks, *Mycobacterium bovis*, animal welfare, control programs; culling, diagnosis, disease control, disease prevalence and prevention, disease surveys, epidemiological surveys, epidemiology, molecular epidemiology, vaccination, vaccines.

Buddle, B.M.; Wedlock, D.N.; Denis, M.; Skinner, M.A. **Identification of immune response correlates for protection against bovine tuberculosis.** *Veterinary Immunology and Immunopathology*. 2005 Oct. 18; 108 (1-2): 45-51. ISSN: 0165-2427. Note: Paper presented at the 7th International Veterinary Immunology Symposium Held July 25-30, 2004, Quebec, Canada.

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Descriptors:** calves, bovine tuberculosis, disease prevention, immune response, vaccines, *Mycobacterium bovis*, vaccination, cell mediated immunity, interferons, subcutaneous injection, messenger RNA, gene expression, interleukin 4, tuberculin, disease detection, disease severity, literature reviews.

Buddle, B.M.; Aldwell, F.E.; Skinner, M.A.; Lisle, G.W. de; Denis, M.; Vordermeier, H.M.; Hewinson, R.G.; Wedlock, D.N. **Effect of oral vaccination of cattle with lipid-formulated BCG on immune responses and protection against bovine tuberculosis.** *Vaccine*. 2005; 23 (27): 3581-3589.

**URL:** <http://www.sciencedirect.com/science/journal/0264410X>

**Descriptors:** calves, *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain vaccine, oral route, 108 colony forming units or 10 pellets of 109 CFU, subcutaneous injections with 106 CFU, varied immune responses, challenge with virulent *Mycobacterium bovis*, caudal fold tuberculin skin test post vaccination, interferon, interleukin 2, T lymphocytes, lungs, procedure produced significant level of protection compared to non-vaccination.

Cadmus, S.I.B.; Arinola, O.G. **Evaluation of the 48 hour, 72 hour and 96 hour readings of tuberculin test for the screening of tuberculosis in cattle.** *African Journal of Clinical and Experimental Microbiology*. 2005; 6 (3): 223-226. ISSN: 1595-689X

**URL:** [http://www.ajol.info/viewarticle.php?](http://www.ajol.info/viewarticle.php?jid=47&id=23100&layout=abstract&OJSSID=37fb63efacde72211b5d1fd3c840f425)

[jid=47&id=23100&layout=abstract&OJSSID=37fb63efacde72211b5d1fd3c840f425](http://www.ajol.info/viewarticle.php?jid=47&id=23100&layout=abstract&OJSSID=37fb63efacde72211b5d1fd3c840f425)

**Descriptors:** cattle, *Mycobacterium tuberculosis*, tuberculin testing, screening, comparison of reading times.

Cadmus, S.I.B.; Atsanda, N.N.; Oni, S.O.; Akang, E.E.U. **Bovine tuberculosis in one cattle herd in Ibadan in Nigeria.** *Veterinari Medicina*. 2004; 49 (11): 406-412. ISSN: 0375-8427

**Descriptors:** 1 private herd, N'dama and White Fulani (i.e. Bunaji) breeds, bovine tuberculosis survey, intradermal comparative cervical tuberculin test, clinical aspects, diagnosis, diagnostic techniques, disease prevalence, epidemiology, histopathology, molecular epidemiology, Nigeria.

Cai, H.; Tian, X.; Hu, X.D.; Li, S.X.; Yu, D.H.; Zhu, Y.X. **Combined DNA vaccines formulated either in DDA or in saline protect cattle from *Mycobacterium bovis* infection.** *Vaccine*. 2005; 23 (30): 3887-3895. ISSN: 0264-410X

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/30521/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/30521/description#description)

**Descriptors:** DNA vaccines, *Mycobacterium tuberculosis* antigens Ag85B, MPT64, MPT83, testing on calves, vaccine plus dimethyldioctyldecyl ammonium bromide (DDA) or saline elicited a strong gamma interferon (IFN-gamma)

response, 1 or 2 months post 3rd vaccination, titers, BCG challenge.

Carrique-Mas, J.J.; Medley, G.F.; Green, L.E. **Risk of bovine tuberculosis breakdowns in post-foot-and-mouth disease restocked cattle herds in Great Britain.** In: Mellor, D.J.; Russell, A.M.; Wood, J.L.N. (Editors). *Society for Veterinary Epidemiology and Preventive Medicine Proceedings of a Meeting Held at Nairn, Inverness, Scotland, 30<sup>th</sup> March 1<sup>st</sup> April-2005*. Published by the Society. 2005: 27-41. ISBN: 0948073691

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, disease control, foot and mouth disease virus, FMD, hazards, risk assessment of animal movements, repopulation purchasing risk factors; survival, Great Britain.

Cedeno, I.; de Obaldia, R.; Sanjur, O.; Bayard, V.; Ortega-Barria, E.; Escobar, C. **Use of the polymerase chain reaction for diagnosing bovine tuberculosis in Panama.** *Revue Scientifique et Technique Office International des Epizooties*. 2005; 24(3): 1067-1075. ISSN: 0253-1933

**NAL Call Number:** SF781.R4

**Descriptors:** cattle industry, *Mycobacterium bovis*, 60 nasal mucus samples, diagnostic testing, PCR species specific primers for diagnostic program, zoonotic threat to public health, Panama.

Cobos-Marin, L.; Montes-Vargas, J.; Zumarraga, M.; Cataldi, A.; Romano, M.I.; Estrada-Garcia, I.; Gonzalez-y-Merchand, J.A. **Spoligotype analysis of *Mycobacterium bovis* isolates from Northern Mexico.** *Canadian Journal of Microbiology*. 2005 Nov.; 51 (11): 996-1000. Note: In English with a French summaryEnglish. ISSN: 0008-4166

**URL:** <http://pubs.nrc-cnrc.gc.ca/rp-ps/journalDetail.jsp?jcode=cjm&lang=eng>

**NAL Call Number:** 448.8 C162

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, strains, bovine tuberculosis, genetic techniques and protocols, polymerase chain reaction, loci, repetitive sequences, spoligotyping, spacer oligonucleotide typing, spoligotypes, Mexico.

Collins, J.D. **The control of tuberculosis in cattle: an Irish view.** *Cattle Practice*. 2005; 13 (4): 361-367. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, badgers (*Meles meles*), *Mycobacterium bovis*, Irish Republic.

Cousins, D.V.; Florisson, N. **A review of tests available for use in the diagnosis of tuberculosis in non-bovine species.** *Revue Scientifique et Technique Office International des Epizooties*. 2005 December; 24 (3): 1039-1059. ISSN: 0253-1933. Note: In English with summaries in English, French and Spanish.

**Descriptors:** bovine tuberculosis, negative social and economic impacts, affects domestic and wild animals, animal diversity, zoonotic diseases, intradermal tuberculin test, ELISA, prescribed test for diagnosis in cattle, *Mycobacterium bovis*, review of various tests used for diagnosis, validated diagnostics for different species, number of animals used for test validation.

Cox, D.R.; Donnelly, C.A.; Bourne, F.J.; Gettinby, G.; McInerney, J.P.; Morrison, W.I.; Woodroffe, R. **Simple model for tuberculosis in cattle and badgers.** *Proceedings of the National Academy of Sciences of the United States of America*. 2005 Dec 6; 102 (49): 17588-17593. ISSN: 0027-8424

**URL:** <http://www.pnas.org/>

**NAL Call Number:** 500 N21P

**Abstract:** As an aid to the study of bovine tuberculosis (TB), a simple model has been developed of an epidemic involving two species, cattle and badgers. Each species may infect the other. The proportion of animals affected is assumed relatively small so that the usual nonlinear aspects of epidemic theory are avoided. The model is used to study the long-run and transient effect on cattle of culling badgers and the effect of a period without routine testing for TB, such as occurred during the 2001 epidemic of foot-and-mouth disease in Great Britain. Finally, by examining the changes in cattle TB over the last 15 years, and with some other working assumptions, it is estimated that the net reproduction number of the epidemic is approximately equal to 1.1. The implications for controlling the disease are discussed.

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, disease transmission, epidemiology, badgers (*Meles meles*), modeling disease transmission, effects of culling badgers, testing interruption, disease control, UK.

Dean, Gillian S.; Rhodes, Shelley G.; Coad, Michael; Whelan, Adam O.; Cockle, Paul J.; Clifford, Derek J.; Hewinson,

R. Glyn; Vordermeier, H. Martin. **Minimum infective dose of *Mycobacterium bovis* in cattle.** *Infection and Immunity*. 2005 Oct; 73 (10): 6467-6471. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The aim of this work was to determine the minimum infective dose of *Mycobacterium bovis* necessary to stimulate specific immune responses and generate pathology in cattle. Four groups of calves (20 animals) were infected by the intratracheal route with 1,000, 100, 10, or 1 CFU of *M. bovis*. Specific immune responses (gamma interferon {IFN-[gamma]} and interleukin-4 [IL-4] responses) to mycobacterial antigens were monitored throughout the study, and the responses to the tuberculin skin test were assessed at two times. Rigorous post mortem examinations were performed to determine the presence of pathology, and samples were taken for microbiological and histopathological confirmation of *M. bovis* infection. One-half of the animals infected with 1 CFU of *M. bovis* developed pulmonary pathology typical of bovine tuberculosis. No differences in the severity of pathology were observed for the different *M. bovis* doses. All animals that developed pathology were skin test positive and produced specific IFN-[gamma] and IL-4 responses. No differences in the sizes of the skin test reactions, the times taken to achieve a positive IFN-[gamma] result, or the levels of the IFN-[gamma] and IL-4 responses were observed for the different *M. bovis* doses, suggesting that diagnostic assays (tuberculin skin test and IFN-[gamma] test) can detect cattle soon after *M. bovis* infection regardless of the dose. This information should be useful in modeling the dynamics of bovine tuberculosis in cattle and in assessing the risk of transmission.

**Descriptors:** cattle, *Mycobacterium bovis*, experimental infection, varying dosages, skin test reactions, diagnostic assays, progress of infection, mathematical modeling of disease, risk of transmission.

Delahay, R.J.; Cheeseman, C.L; Mallinson, P.J; Rogers, L.M.; Smith, G.C. **Badgers and bovine tuberculosis: a review of studies in the ecology of a wildlife disease reservoir.** *Cattle Practice*. 2005; 13(4): 295-299. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** wild badgers (*Meles meles*), cattle, wild animals as disease reservoirs, *Mycobacterium bovis*, UK.

Denis, Michel; Keen, Denise L.; Wedlock, D. Neil; de Lisle, Geoffrey W.; Buddle, Bryce M. **Susceptibility of brushtail possums (*Trichosurus vulpecula*) infected with *Mycobacterium bovis* is associated with a transient macrophage activation profile.** *Tuberculosis* (Amsterdam). 2005; 85 (4): 235-244. ISSN: 1472-9792

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/638428/description?navopenmenu=-2](http://www.elsevier.com/wps/find/journaldescription.cws_home/638428/description?navopenmenu=-2)

**Descriptors:** Australian brushtail possum (*Trichosurus vulpecula*), wildlife reservoir for pathogen, *Mycobacterium bovis* virulent strain, pathogenesis, disease process, experimental infection, aerosol exposure, lung lesions, livers, spleens, blood lymphocytes proliferated, nitric oxide levels in lungs, tumor necrosis factor alpha, transient activation of alveolar macrophages, New Zealand.

Dhakal, M.; Shrestha, R.G.; Jha, V.C.; Dhakal, P.R.; Sato, T.; Morita, Y.; Kozawa, K.; Kimura, H. **Heat treatment effects on *Mycobacterium* spp. isolated from ruminants in Nepal.** *Veterinary Microbiology*. 2005; 106 (3-4): 303-304. ISSN: 0378-1135

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** Jersey cow, Murrah buffalo, *Mycobacterium avium*, *Mycobacterium bovis*, strains NPMb-2 and NPMb-1, *Mycobacterium thermoresistible* strains NPMth-2 and NPMth-1, *Mycobacterium fortuitum* strain NPMfo-1, heat treatment effects, applied and field techniques, single intradermal cervical tuberculin test: SICT, clinical techniques, diagnostic techniques, Nepal.

Dunn, John R.; Kaneene, John B.; Grooms, Daniel L.; Bolin, Steven R.; Bolin, Carole A.; Bruning Fann, Colleen S.

**Effects of positive results for *Mycobacterium avium* subsp *paratuberculosis* as determined by microbial culture of feces or antibody ELISA on results of caudal fold tuberculin test and interferon-gamma assay for tuberculosis in cattle.** *Journal of the American Veterinary Medical Association*. 2005; 226(3): 429-435. ISSN: 0003-1488

**URL:** <http://avmajournals.avma.org/loi/javma>

**NAL Call Number:** 41.8 AM3

**Descriptors:** cattle, comparison study, positive potential of false positives for *Mycobacterium bovis* if positive for *M. avium* ssp *paratuberculosis*, microbial culture of feces or antibody ELISA, caudal fold tuberculin test or interferon-gamma assay for *M. bovis*, no significant association was established, 10 herds in Michigan.

Efford, M.; Norbury, G. **Ferret population assessment: progress and challenges.** In: *13<sup>th</sup> Australasian Vertebrate Pest Conference, Wellington, New Zealand, 2-6 May 2005*. Published by Manaaki Whenua Press, Landcare Research. Lincoln, New Zealand. 2005: 75-80.

**Descriptors:** cattle, ferrets, *Mycobacterium bovis*, wild animal disease reservoirs, disease vectors, bait traps; baiting, baits, capture of feral animals, control programs, dispersal of feral animals, invasions, population levels, methodology, pest control, pest management, population density, population dynamics, reservoir hosts, trapping, vertebrate pests, wild animals, New Zealand.

Fend, R.; Geddes, R.; Lesellier, S.; Vordermeier, H.M.; Corner, L.A.L.; Gormley, E.; Costello, E.; Hewinson, R.G.; Marlin, D.J.; Woodman, A.C.; Chambers, M.A. **Use of an electronic nose to diagnose *Mycobacterium bovis* infection in badgers and cattle.** *Journal of Clinical Microbiology*. 2005; 43 (4): 1745-1751. ISSN: 0095-1137

**URL:** <http://jcm.asm.org/cgi/content/abstract/43/4/1745>

**NAL Call Number:** QR46.J6

**Abstract:** It is estimated that more than 50 million cattle are infected with *Mycobacterium bovis* worldwide, resulting in severe economic losses. Current diagnosis of tuberculosis (TB) in cattle relies on tuberculin skin testing, and when combined with the slaughter of test-positive animals, it has significantly reduced the incidence of bovine TB. The failure to eradicate bovine TB in Great Britain has been attributed in part to a reservoir of the infection in badgers (*Meles meles*). Accurate and reliable diagnosis of infection is the cornerstone of TB control. Bacteriological diagnosis has these characteristics, but only with samples collected postmortem. Unlike significant wild animal reservoirs of *M. bovis* that are considered pests in other countries, such as the brushtail possum (*Trichosurus vulpecula*) in New Zealand, the badger and its sett are protected under United Kingdom legislation (The Protection of Badgers Act 1992). Therefore, an accurate in vitro test for badgers is needed urgently to determine the extent of the reservoir of infection cheaply and without destroying badgers. For cattle, a rapid on-farm test to complement the existing tests (the skin test and gamma interferon assay) would be highly desirable. To this end, we have investigated the potential of an electronic nose (EN) to diagnose infection of cattle or badgers with *M. bovis*, using a serum sample. Samples were obtained from both experimentally infected badgers and cattle, as well as naturally infected badgers. Without exception, the EN was able to discriminate infected animals from controls as early as 3 weeks after infection with *M. bovis*, the earliest time point examined postchallenge. The EN approach described here is a straightforward alternative to conventional methods of TB diagnosis, and it offers considerable potential as a sensitive, rapid, and cost-effective means of diagnosing *M. bovis* infection in cattle and badgers..

**Descriptors:** *Mycobacterium bovis* detection, electronic nose, badgers (*Meles meles*), cattle, sero testing.

Fischer, E.A.J.; van Roermund, H.J.W.; Hemerik, L.; van Asseldonk, M.A.P.M.; De Jong, M.C.M. **Evaluation of surveillance strategies for bovine tuberculosis (*Mycobacterium bovis*) using an individual based epidemiological model.** *Preventive Veterinary Medicine*. 2005; 67 (4): 283-301. ISSN: 0167-5877

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503315/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503315/description#description)

**NAL Call Number:** SF601.P7

**Descriptors:** bovine tuberculosis status, surveillance system, visual inspection of carcasses at slaughter, ELISA blood sampling post slaughter, gamma-interferon, pre-slaughter of herds and ELISA test on bulk milk, stochastic individual based model simulating a chain of infected herds, epidemiological modeling, possible effects of one infected animal into one herd, analysis of optimization of a 6 approaches, Netherlands.

Fishwick, J. (editor). **Cattle practice.** *Cattle Practice*. 2005; 13 (4): 183 pp. ISSN: 0969-1251. Note: Special issue on bovine tuberculosis.

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain, *Trichosurus vulpecula*, *Meles meles*, diagnosis, diagnostic techniques, disease control programs, disease prevalence, disease transmission, disease vectors and reservoirs, vaccination, wild animals.

Fikru, R.; Bonnet, P.; Moges, W. **Prevalence of bovine tuberculosis in indigenous Zebu cattle under extensive farming system in Western Ethiopia.** *Bulletin of Animal Health and Production in Africa*. 2005; 53(1): 85-88. ISSN: 0378-9721. Note: In English with a French summary.

**URL:** [http://www.ajol.info/journal\\_index.php?ab=bahpa](http://www.ajol.info/journal_index.php?ab=bahpa)

**NAL Call Number:** 41.8 B872

**Descriptors:** indigenous zebu cattle, bovine tuberculosis, *Mycobacterium bovis*, disease survey, 35 small holder extensive production, housing, feeding, cattle movement patterns, cattle diseases, purpose of cattle keeping, respiratory diseases, trypanosomiasis, black leg, anthrax, diarrhea, etc, intradermal tuberculin tests, modes of disease transmission, Bodji district, Ethiopia.

Foote, M.R.; Nonnecke, B.J.; Waters, W.R.; Palmer, M.V.; Beitz, D.C.; Fowler, M.A.; Miller, B.L.; Johnson, T.E.; Perry, H.B. **Effects of increased dietary protein and energy on composition and functional capacities of blood mononuclear cells from vaccinated, neonatal calves.** *International Journal for Vitamin and Nutrition Research*. 2005 Sept.; 75 (5): 357-368. ISSN: 0300-9831

**URL:** <http://www.verlag-hanshuber.com/zeitschriften/journal.php?abbrev=VIT>

**NAL Call Number:** 389.8 Z33

**Abstract:** Effects of increased protein and energy provided by an intensified milk replacer on the antigen-specific, cell-mediated immune response of the neonatal calf were examined. Calves were fed a standard (0.45 kg/day of a 20% crude protein, 20% fat milk replacer; n = 11) or intensified (1.14 kg/day of a 28% crude protein, 20% fat milk replacer; n = 11) diet from 0 to 6 weeks of age. All calves were vaccinated with *Mycobacterium bovis* bacillus Calmette-Guerin (BCG) at 1 week of age. The daily weight gain of intensified-diet calves (0.62 kg/day) was greater than the weight gain of standard-diet calves (0.29 kg/day). Liver, kidney, heart, thymus, and subcervical lymph nodes from intensified-diet calves were heavier than the same organs from standard-diet calves. Flow cytometric analysis of peripheral blood mononuclear cell (PBMC) populations indicated that CD4+ cells, gamma delta TCR+ cells, and monocyte percentages, although unaffected by diet during the first 5 weeks of the study, were higher in intensified-diet calves at week 6. The decline in gamma delta TCR+ cell percentages and increase in B cell percentages with increasing age seen in all calves are characteristic of the maturing immune system of the calf. CD8+ T cell or B cell percentages were not affected by diet. In intensified-diet calves, percentages of CD4+ expressing interleukin-2 receptor increased and percentages of gamma delta TCR+ cells expressing interleukin-2 receptor decreased with time. The same populations in standard-diet calves did not change with time. Percentages of CD4+ and CD8+ T cells, and B cells expressing MHC class II antigen, were unaffected by diet or age. Although mitogen-induced interferon (IFN)-gamma and nitric oxide (NO) secretion increased with age for all calves, PBMC from intensified-diet calves produced less IFN-gamma and more NO than did cells from standard-diet calves at week 6 of the study. Antigen-induced secretion of IFN-gamma and NO also increased with age but was unaffected by diet. Antigen-elicited delayed-type hypersensitivity was unaffected by diet, suggesting increased dietary protein and energy did not alter adaptive immunity in vivo. Overall, these results suggest that feeding calves a commercially available, intensified milk replacer affects minimally the composition and functional capacities of PBMC populations. Additional research is necessary to determine whether these subtle effects influence the calf's susceptibility to infectious disease.

**Descriptors:** calves, neonates, calf feeding, dietary protein, dietary energy sources, monocytes, vaccination, milk replacer, immune response, cell mediated immunity, crude protein, CD8+ T lymphocytes, *Mycobacterium bovis* BCG, BCG vaccine, bovine tuberculosis, liveweight gain, animal organs, tissue weight, CD4+T lymphocytes, B lymphocytes, interleukin 2, major histocompatibility complex, histocompatibility antigens, interferons.

Gallagher, J. **Tuberculosis: tracing the dilemma.** *Veterinary Times*. 2005; 35 (27): 14-17. ISSN: 1352-9374

**Descriptors:** badgers (*Meles meles*) as pathogenic disease reservoirs, cattle, *Mycobacterium bovis*, epidemiology, disease prevalence and transmission, seasonal effects, disease control strategies, trapping, pathobiology, abscesses, various organs with lesions, latent infections, vaccines, bites, wounds, mortality rates, England.

Gilbert, M.; Mitchell, A.; Bourn, D.; Mawdsley, J.; Clifton-Hadley, R.; Wint, W. **Cattle movements and bovine tuberculosis in Great Britain.** *Nature*. 2005; 435 (7041): 491-496. ISSN: 0028-0836

**URL:** <http://www.nature.com/index.html>

**NAL Call Number:** 472 N21

**Abstract:** For 20 years, bovine tuberculosis (BTB) has been spreading in Great Britain (England, Wales and Scotland) and is now endemic in the southwest and parts of central England and in southwest Wales, and occurs sporadically elsewhere. Although its transmission pathways remain poorly understood, the disease's distribution was previously modelled statistically by using environmental variables and measures of their seasonality. Movements of infected animals have long been considered a critical factor in the spread of livestock diseases, as reflected in strict import/export regulations, the extensive movement restrictions imposed during the 2001 foot-and-mouth disease outbreak, the tracing procedures after a new case of BTB has been confirmed and the Government's recently published

strategic framework for the sustainable control on BTB. Since January 2001 it has been mandatory for stock-keepers in Great Britain to notify the British Cattle Movement Service of all cattle births, movements and deaths. Here we show that movements as recorded in the Cattle Tracing System data archive, and particularly those from areas where BTB is reported, consistently outperform environmental, topographic and other anthropogenic variables as the main predictor of disease occurrence. Simulation distribution models for 2002 and 2003, incorporating all predictor categories, are presented and used to project distributions for 2004 and 2005.

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, animal transport, geographical distribution, disease transmission tracking, epidemiology, simulation models, Great Britain.

Green, L.E.; Cornell, S.J. **Investigations of cattle herd breakdowns with bovine tuberculosis in four counties of England and Wales using VETNET data.** *Preventive Veterinary Medicine*. 2005 Sept 12; 70 (3-4): 293-311. ISSN: 0167-5877

**NAL Call Number:** SF601.P7

**Abstract:** Cattle herd breakdown (HBR) with bovine tuberculosis (BTB) was investigated for farms in four counties of England and Wales outside southwest England from 1986 to early 2000. Data from the national database of TB testing history (VETNET) were used. Factors that influenced HBR included calendar time, herd size, number of cattle tested, the test type, the inter-test interval and spatial grouping of farms. Herd tests other than routine herd tests had an increased risk of HBR in all four counties. In all counties, the risk of HBR increased with calendar time and in Shropshire a test interval of 3 years was associated with an increased risk of HBR compared with a 1-year test interval. In Staffordshire and Sussex, a 4-year test interval was associated with a lower risk of HBR compared with a 1-year test interval. There was no evidence of spatial clustering of HBR in West Glamorgan (equal spatial risk in a 15-30 km radius) and weak evidence of spatial clustering in Shropshire (7-15 km) and Sussex (5-10 km). In Staffordshire, there was evidence of spatial (2-4 km) and time (3-4 years) clustering of HBR. The locally increased rate of testing following a confirmed HBR increased the detection of infected herds but did not prevent local spread in two of the four counties (Shropshire and Staffordshire) since the rate of HBR increased linearly from 1988 to 2000. The main conclusion is that there were both local and distant components of spread.

**Descriptors:** dairy cattle, *Mycobacterium bovis*, bovine tuberculosis, disease prevalence, disease transmission, herd size, risk assessment, risk factors, herd health, databases, herd breakdown, VETNET database, England, Wales.

Green, L. **Modelling disease - a guide for the cattle practitioner.** *Cattle Practice*. 2005; 13 (3): 243-248. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, cattle diseases, *Mycobacterium bovis*, foot and mouth disease, disease models, mathematical models, statistical models, analysis, risk assessment, infectious disease processes, disease transmission hypotheses.

Griffin, J.M.; Williams, D.H.; Kelly, G.E.; Clegg, T.A.; O'Boyle, I.; Collins, J.D.; More, S.J. **The impact of badger removal on the control of tuberculosis in cattle herds in Ireland.** *Preventive Veterinary Medicine*, 2004; 67: 237-266. ISSN: 0167-5877

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503315/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503315/description#description)

**NAL Call Number:** SF601.P7

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, diagnosis, disease prevention and control programs, disease-prevalence, wild life as disease reservoirs, epidemiology, regression analysis, trapping, vector control, wild animals, Irish Republic.

Griffin, J.M.; More, S.J.; Clegg, T.A.; Collins, J.D.; O'Boyle, I.; Williams, D.H.; Kelly, G.E.; Costello, E.; Sleeman, D.P.; O'Shea, F.; Duggan, M.; Murphy, J.; Lavin, D.P.T. **Tuberculosis in cattle: the results of the four-area project.** *Irish Veterinary Journal*. 2005; 58 (11): 629-636. ISSN: 0368-0762.

**URL:** [www.veterinary-ireland.org](http://www.veterinary-ireland.org)

**NAL Call Number:** 41.8 IR4

**Descriptors:** *Mycobacterium bovis*, outbreaks, cattle, badgers (*Meles meles*), epidemiology, disease control and prevention, disease prevalence, disease transmission, wild badgers as a disease pathogen reservoir, reviews, Irish Republic.

Griffin, J.M.; Clegg, T.A.; Kelly, G.E.; Williams, D.H.; O'Boyle, I.; Collins, J.D.; More, S.J. **The impact of badger removal on the control of tuberculosis in cattle herds in Ireland.** In: D.J. Mellor; A.M. Russell; J.L.N. Wood

(Editors). *Society for Veterinary Epidemiology and Preventive Medicine Proceedings of a Meeting Held at Nairn, Inverness, Scotland, 30<sup>th</sup> March 1<sup>st</sup> April 2005*. Published by Society for Veterinary Epidemiology and Preventive Medicine. Roslin, UK. 2005; 42-54. ISBN: 0948073691

**Descriptors:** cattle, badgers (*Meles meles*), *Mycobacterium bovis*, disease control, disease vectors, risk assessment, survival, tuberculosis, Ireland.

Hewes, C.A.; Schneider, R.K.; Baszler, T.V.; Oaks, J.L. **Septic arthritis and granulomatous synovitis caused by infection with *Mycobacterium avium* complex in a horse**. *Journal of the American Veterinary Medical Association*. 2005 June 15; 226 (12): 2035-2038. ISSN: 0003-1488

**NAL Call Number:** 41.8 Am3

**Descriptors:** horses, arthritis, sepsis (infection), horse diseases, synovitis, *Mycobacterium avium* complex, mycobacterial diseases, lameness, case studies, pain, granulomatous-synovitis

Hope, J.C.; Thom, M.L.; Villareal-Ramos, B; Vordermeier, H.M.; Hewinson, R G; Howard, C J. **Exposure to *Mycobacterium avium* induces low-level protection from *Mycobacterium bovis* infection but compromises diagnosis of disease in cattle** (vol 141, pg 432, 2005). *Clinical and Experimental Immunology*. 2005; 142 (3): 595. ISSN: 0009-9104. Note: Errata: article.

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0009-9104>

**NAL Call Number:** QR180.C5

**Descriptors:** *Mycobacterium bovis*, effects of exposure to *Mycobacterium avium*, skin testing, cattle testing and diagnosis unreliable.

Hope, J.C.; Thom, M.L.; Villarreal-Ramos, B.; Vordermeier, H.M.; Hewinson, R.G.; Howard, C.J. **Exposure to *Mycobacterium avium* induces low-level protection from *Mycobacterium bovis* infection but compromises diagnosis of disease in cattle**. *Clinical and Experimental Immunology*. 2005; 141 (3): 432-439. ISSN: 0009-9104

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0009-9104>

**NAL Call Number:** QR180.C5

**Descriptors:** calves, *Mycobacterium avium* exposure, *Mycobacterium bovis* challenge, immune responses, exposure to *Mycobacterium avium* may mask diagnosis of *Mycobacterium bovis* infection even with specific antigens can contribute to disease transmission in the field.

Hope, J.C.; Thom, M.L.; Villarreal-Ramos, B.; Vordermeier, H.M.; Hewinson, R.G.; Howard, C.J. **Exposure to *Mycobacterium avium* induces low-level protection from *Mycobacterium bovis* infection but compromises diagnosis of disease in cattle**. *Clinical and Experimental Immunology*. 2005; 141 (3): 432-439. ISSN: 0009-9104

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0009-9104>

**NAL Call Number:** QR180.C5

**Descriptors:** calves, cattle diseases, *Mycobacterium avium*, *Mycobacterium bovis*, bacterial antigens, diagnosis, diagnostic techniques, experimental infections, development of immune response, immunity, interferon, T lymphocytes, pathogenesis, postmortem examinations, skin tests, tuberculin.

Hope, J.C.; Thom, M.L.; Villarreal-Ramos, B.; Vordermeier, H.M.; Hewinson, R.G.; Howard, C.J. **Vaccination of neonatal calves with *Mycobacterium bovis* BCG induced protection against intranasal challenge with virulent *M. bovis*** (vol 139, pg 48, 2005). *Clinical and Experimental Immunology*. 2005; 140 (1): 192. ISSN: 0009-9104. Note: Errata; Article.

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0009-9104>

**NAL Call Number:** QR180.C5

**Descriptors:** neonatal calves, vaccination with *Mycobacterium bovis*, BCG, level of protection with trans-nasal challenge with virulent *Mycobacterium bovis*.

Hope, J.C.; Thom, M.L.; Villarreal-Ramos, B.; Vordermeier, H.M.; Hewinson, R.G.; Howard, C.J. **Vaccination of neonatal calves with *Mycobacterium bovis* BCG induces protection against intranasal challenge with virulent *M. bovis***. *Clinical and Experimental Immunology*. 2005; 139 (1): 48-56. ISSN: 0009-9104

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0009-9104>

**NAL Call Number:** QR180.C5

**Descriptors:** 2 week old calves, neonates vaccinated with *Mycobacterium bovis* BCG, *Mycobacterium bovis*, virulent

strain challenge intra-nasally, experimental infection, tissue examined for lesions, chest lymph nodes, neonate vaccination induced significant protection against disease, potential for disease control.

Jahans, K.L.; Worth, D.; Brown, J.; Monies, R.J. **Detection of bovine tuberculosis in spill-over hosts.** *Research in Veterinary Science*. 2005; 78 (Suppl. A): 23-24. ISSN: 0034-5288. Note: Meeting abstract. 59th Annual Conference of the Association for Veterinary Teaching and Research Work, Scarborough, England; March 21 -23, 2005  
**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Descriptors:** *Mycobacterium bovis*, cattle, buffalo, bison, sheep, goats, dogs, deer, cats, badgers, pigs, domestic and wildlife species, spill over hosts, end hosts, animal pathogen reservoirs, maintenance hosts.

Jesenska, Andrea; Pavlova, Martina; Strouhal, Michal; Chaloupkova, Radka; Tesinska, Iva; Monincova, Marta; Prokop, Zbynek; Bartos, Milan; Pavlik, Ivo; Rychlik, Ivan; Moebius, Petra; Nagata, Yuji; Damborsky, Jiri. **Cloning, biochemical properties, and distribution of mycobacterial haloalkane dehalogenases.** *Applied and Environmental Microbiology*. 2005; 71 (11): 6736-6745. ISSN: 0099-2240

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=83>

**NAL Call Number:** 448.3 Ap5

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, haloalkane dehalogenases, enzymes, cloning of enzyme genes dmbA and dmbB of *M. bovis* 5033/66, dehalogenase activity of translation products, distribution of genes in following species--*Mycobacterium bovis*, *Mycobacterium bovis* BCG, *Mycobacterium africanum*, *Mycobacterium caprae*, *Mycobacterium microti*, and *Mycobacterium pinnipedii*, characterization of proteins, evolution and distribution of haloalkane dehalogenases among mycobacteria.

Jiang, XiuYun; He, ZhaoYang. **DNA injection via in vivo electroporation: a new immunisation technique for bovine tuberculosis.** *Chinese Journal of Zoonoses*. 2005; 21 (2): 182-184. ISSN: 1002-2694. Note: In Chinese.

**Descriptors:** cattle, pigs, sheep, *Mycobacterium bovis*, DNA injection technique, immune reactions, vaccines, electroporation, immunization, 2 different vaccines used with no interference between them.

Kumar, K.; Swamy, M. **Miliary tuberculosis in cross-bred cows.** *Indian Journal of Veterinary Pathology*. 2005; 29 (1): 50-51. ISSN: 0250-4758

**Descriptors:** cattle, tuberculosis, *Mycobacterium tuberculosis*, India.

Lutze Wallace, C.; Turcotte, C.; Sabourin, M.; Berlie-Surujballi, G.; Barbeau, Y.; Watchorn, D.; Bell, J. **Spoligotyping of *Mycobacterium bovis* isolates found in Manitoba.** *Canadian Journal of Veterinary Research = Revue Canadienne de Recherche Veterinaire*. 2005 Apr; 69 (2): 143-145. ISSN: 0830-9000. Note: In English with a French summary.

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=133>

**NAL Call Number:** SF601.C24

**Descriptors:** deer, cattle, elk, *Cervus elaphus Canadensis*, *Mycobacterium bovis*, microsatellite repeats, 44 isolates, tissue sources, hybridized with oligonucleotide 12 (MB-1 type), oligonucleotide 12 (MB-1 type), oligonucleotide 12 (MB-2 type), Manitoba, Canada.

Lutze-Wallace, C.; Turcotte, C. **Laboratory diagnosis of bovine tuberculosis in Canada for calendar year 2004.** *Canadian Veterinary Journal*. 2005; 46 7(9): 797-799. ISSN: 0008-5286. Note: In English and French.

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=202>

**NAL Call Number:** 41.8 R3224

**Descriptors:** wild animals, zoo animals, livestock, bison, cattle, *Cervus elaphus*, deer, elephants, equines, cats, bacterial disease, *Mycobacterium*, *Mycobacterium avium*, *Mycobacterium avium* ssp *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium fortuitum*, *Mycobacterium kansasii*, *Mycobacterium flavescens*, *Mycobacterium triviale*, *Mycobacterium terrae*, red deer, pigs, Suiformes, disease diagnosis, disease surveys, Alberta, British Columbia, Manitoba, Ontario, Quebec, Saskatchewan, Canada.

Mahendra-Pal **Importance of zoonoses in public health.** *Indian Journal of Animal Sciences*. 2005; 75 (5): 586-591. ISSN: 0367-8318

**NAL Call Number:** 41.8 IN22

**Descriptors:** cattle, humans, wild animals, *Mycobacterium bovis*, *Yersinia pestis*, zoonotic diseases, animal diseases, disease prevalence, control programs, disease prevention, epidemiology, human diseases, morbidity, mortality, plague,

public health, sanitation, hygiene, zoonoses, Gujarat, Maharashtra, India, USA.

Maheshwari, Arpan; Verma, Rishendra. **Evaluation of three antigens by enzyme-linked immunosorbent assay (ELISA) for the detection of *Mycobacterium bovis* infection in Indian cattle for field use.** *Indian Journal of Animal Sciences*. 2005; 75 (4): 401-406. ISSN: 0367-8318

**NAL Call Number:** 41.8 IN22

**Descriptors:** *Mycobacterium bovis* AN5, crude antigens form purified protein derivative PPD, species specific phenolic glycolipid, 3 groups of cattle, cattle testing with tuberculin, not tuberculin tested, tuberculin testing in last 14 days, sera collected, ELISA assay, histogram cut off values ELISA assay with PPD, sensitivity and specificity of assay depends on population tested.

Manal, S.H.; Hamid, M.E.; El Jalii, I.M.; Ali, A.S. **Correlation between microscopic examination and culture for detection and differentiation of mycobacterial isolates from cattle in the Sudan.** *Pakistan Journal of Biological Sciences*. 2005; 8 (2): 284-286.

**Descriptors:** cattle, postmortem sampling, slaughtered animals, lymph nodes, tuberculous lungs, histopathology, microscopic examination Zeilh-Neelsen stain, culture on Lowenstein-Jensen (L-J) medium, detection and differentiation of mycobacterium species isolates, *Mycobacterium farcinogenes*, *Mycobacterium bovis*, differential detection, Khartoum State, Sudan.

Maue, Alexander C.; Waters, W. Ray; Davis, William C.; Palmer, Mitchell V.; Minion, F. Chris; Estes, D. Mar. **Analysis of immune responses directed toward a recombinant early secretory antigenic target six-kilodalton protein-culture filtrate protein 10 fusion protein in *Mycobacterium bovis* infected cattle.** *Infection and Immunity*. 2005 Oct; 73 (10): 6659-6667. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** Cell-mediated immune responses are critical for protective immunity to mycobacterial infections. Recent progress in defining mycobacterial antigens has determined that region of difference 1 (RD1) gene products induce strong T-cell responses, particularly the early secretory antigenic target 6-kDa (ESAT-6) protein and culture filtrate protein 10 (CFP10). However, comprehensive analysis of the immune response towards these antigens is incompletely characterized. To evaluate recall responses to ESAT-6 and CFP10, peripheral blood mononuclear cells from *M. bovis*-infected cattle were stimulated in vitro with a recombinant ESAT-6 (rESAT-6)-CFP10 fusion protein and compared to responses induced by *M. bovis*-derived purified protein derivative. Following antigenic stimulation, activation marker expression was evaluated. Significant proliferative responses ( $P < 0.05$ ) were evident in CD4+, CD8+, immunoglobulin M-positive, and CD172a+ cell fractions after 6 days of culture. Expression of CD25 and CD26 was increased ( $P < 0.05$ ) on CD4+, CD8+, and  $[\gamma][\delta]$  T-cell-receptor-positive cells. CD4+ and CD8+ cells also exhibited significant changes ( $P < 0.05$ ) in expression of CD45 isoforms. Using a flow cytometry-based proliferation assay, it was determined that CD45R expression is downregulated ( $P < 0.05$ ) and that CD45RO expression is upregulated ( $P < 0.05$ ) on proliferating (i.e., activated) CD4+ cells. Collectively, data indicate that recall immune responses directed toward the rESAT-6-CFP10 fusion protein or purified protein derivative are comparable and that recall to mycobacterial antigens correlates with a CD45RO+ phenotype.

**Descriptors:** cattle, cell-mediated responses, mycobacterian antigens, 1 (RD1) gene products, T cell responses, 6kDa (ESAT 6) protein and culture filtrate protein 10 (CFP10), animal experiment.

McCorry, T.; Whelan, A.O.; Welsh, M.D.; McNair, J.; Walton, E.; Bryson, D.G.; Hewinson, R.G.; Vordermeier, H.M.; Pollock, J.M. **Shedding of *Mycobacterium bovis* in the nasal mucus of cattle infected experimentally with tuberculosis by the intranasal and intratracheal routes.** *Veterinary Record*. 2005 Nov. 12; 157 (20) 613-618. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/>

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, *Mycobacterium bovis*, disease transmission, experimental infection, routes of infection, pathogen shedding, nasal mucus.

Mdegela, R.H.; Karimuribo, E.; Kusiluka, L.J.M.; Kabula, B.; Manjurano, A.; Kapaga, A.M.; Kambarage, D.M. **Mastitis in smallholder dairy and pastoral cattle herds in the urban and peri-urban areas of the Dodoma municipality in Central Tanzania.** *Livestock Research for Rural Development*. 2005; 17 (11): 123. ISSN: 0121-

**Descriptors:** 64 small holder dairy cattle, disease levels, ELISA, single comparative intradermal tuberculin tests, *Arcanobacterium pyogenes*, *Aspergillus*, *Bacillus*, *Brucella*, *Escherichia coli*, *Klebsiella*, *Mucor*, *Mycobacterium* sp, *Mycobacterium avium* complex, *Mycobacterium fortuitum*, *Mycobacterium phlei*, *Mycobacterium smegmatis*, *Serratia*, *Staphylococcus*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Staphylococcus intermedius*, Hyphomycetes, Mucoraceae, *Mycobacterium flavescens*, *Mycobacterium gordonae*, Dodoma, Tanzania.

Mellor, D.J.; Russell, A.M.; Wood, J.L.N. (Editors). ***Society for Veterinary Epidemiology and Preventive Medicine. Proceedings of a Meeting Held at Nairn, Inverness, Scotland, 30th March-1st April 2005.*** Published by the Society. 2005. 277 pp. ISBN: 0948073691.

**Descriptors:** many papers, topics include animals diseases, epidemiology, disease prevalence, disease transmission and spread, disease control and prevention, diagnosis, reservoir hosts, public health aspects, bovine tuberculosis, *Mycobacterium bovis*, classical swine fever, rabies, pancreatic necrosis virus, foot and mouth disease, avian influenza A virus, *Streptococcus suis*, *Escherichia coli*, *Campylobacter*, *Salmonella* spp., *Ostertagia ostertagi*, broilers, domestic livestock, wild animal disease carriers, UK.

Menzies, F.D.; Neill, S.D. **Bovine tuberculosis: controlling cattle-to-cattle transmission.** *Cattle Practice.* 2005; 13 (4): 441-446. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, *Mycobacterium bovis*, transmission between cattle, controlling disease spread.

Monaghan, M.L.; Doherty, M L.; Collins, J.D.; Kazda, J.F.; Quinn, P.J. **The tuberculin test.** *Cattle Practice.* 2005; 13 (4): 337-345. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculin skin testing, efficacy, UK.

Morales, A.; Martinez, I.; Carlos, A.; Alvarez, G.; Alvarez, M.; Maldonado, J. **Comparacion de histopatologia, cultivo y PCR en el diagnostico de tuberculosis bovina. [Comparison of histopathology, culture and PCR in the diagnosis of bovine tuberculosis.]** *Revista Cientifica, Facultad de Ciencias Veterinarias, Universidad del Zulia.* 2005; 15 (2): 103-108. ISSN: 0798-2259. Note: In Spanish with an English summary.

**Descriptors:** cattle, *Mycobacterium bovis*, bovine tuberculosis, tuberculin testing, diagnosis, diagnostic techniques, histopathology, PCR of tissue, histopathological analysis, bacterial isolation, Mexico.

More, S.J. **Towards eradication of bovine tuberculosis in Ireland: a critical review of progress.** *Cattle Practice.* 2005; 13 (4): 313-318. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle diseases, *Mycobacterium bovis*, tuberculosis control program, disease transmission from wildlife to cattle, wildlife disease reservoir, cattle to cattle transmission, epidemiology, development of a vaccine for badgers (*Meles meles*), eradication strategy, Irish Republic.

More, S.J. **Towards eradication of bovine tuberculosis in Ireland: a critical review of progress.** In: D.J. Mellor; A.M. Russell; J.L.N. Wood. (Editors). *Society for Veterinary Epidemiology and Preventive Medicine Proceedings of a Meeting Held at Nairn, Inverness, Scotland, 30<sup>th</sup> March-1<sup>st</sup> April, 2005.* Published by the Society. 2005; 13-23. ISBN: 0948073691

**Descriptors:** *Mycobacterium bovis*, bovine tuberculosis, eradication program, evidence of disease transmission badgers to cattle, wildlife reservoirs difficult to control, program for effective vaccine for badgers, Ireland.

Morrison, W.I.; Bourne, F.J.; Cox, D.R.; Donnelly, C.A.; Gettinby, G.; McInerney, J.P.; Woodroffe, R. **Pathogenesis and diagnosis of infections with *Mycobacterium bovis* in cattle.** *Cattle Practice.* 2005; 13 (4): 351-360. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, *Mycobacterium bovis*, disease development, pathogenesis, diagnostic approaches, UK.

Neill, S.D.; Skuce, R.A.; Pollock, J.M. **Tuberculosis - new light from an old window.** *Journal of Applied Microbiology.* 2005; 98 (6): 1261-1269. ISSN: 1364-5072

**URL:** <http://www3.interscience.wiley.com/journal/118490255/home>

**NAL Call Number:** QR1.J687

**Descriptors:** bovine tuberculosis, zoonotic aspects, new information about *Mycobacterium bovis*, recent developments, pathogenesis, epidemiology, disease eradication, diagnosis, vaccination.

Nonnecke, B.J.; Waters, W.R.; Foote, M.R.; Palmer, M.V.; Miller, B.L.; Johnson, T.E.; Perry, H.B.; Fowler, M.A.

**Development of an adult-like cell-mediated immune response in calves after early vaccination with *Mycobacterium bovis* bacillus Calmette-Guerin.** *Journal of Dairy Science*. 2005 Jan.;88(1): 195-210. ISSN: 0022-0302

**URL:** <http://jds.fass.org/contents-by-date.0.shtml>

**NAL Call Number:** 44.8 J822

**Descriptors:** *Mycobacterium bovis* BCG, lymphocyte proliferation, T lymphocytes.

Nonnecke, B.J.; Waters, W.R.; Foote, M.R.; Palmer, M.V.; Miller, B.L.; Johnson, T.E.; Perry, H.B.; Fowler, M.A.

**Development of an adult-like cell-mediated immune response in calves after early vaccination with *Mycobacterium bovis* bacillus Calmette-Guerin.** *Journal of Dairy Science*. 2005; 88 (1): 195-210. ISSN: 0022-0302

**URL:** <http://jds.fass.org/contents-by-date.0.shtml>

**NAL Call Number:** 44.8 J822

**Descriptors:** Holstein bull calves, effects of neonatal vaccination, young adults, attenuated strain of *Mycobacterium bovis* BCG, effects on antigen-specific cellular and humoral immune responses, ontogeny of adaptive immune response, functional capacities of blood mononuclear cell populations, 1-12 week time periods, nulliparous heifers vaccinated, effects of animal maturity on response, bovine neonate can mount a vigorous, adult like cell mediated immune response after early age vaccination.

Norby, B.; Bartlett, P.C.; Grooms, D.L.; Kaneene, J.B.; Bruning-Fann, C.S. **Use of simulation modeling to estimate herd-level sensitivity, specificity, and predictive values of diagnostic tests for detection of tuberculosis in cattle.** *American Journal of Veterinary Research*. 2005; 66 (7): 1285-1291

**Descriptors:** cattle herds, *Mycobacterium bovis*, diagnosis, diagnostic techniques, estimation, computer simulation models for testing scenarios for tuberculosis, Michigan, US.

O'Rourke, K. **Teasing out *Mycobacterium bovis*' role in the tuberculosis crisis.** *Journal of the American Veterinary Medical Association*. 2005; 227 (6): 871. ISSN: 0003-1488

**URL:** <http://avmajournals.avma.org/loi/javma>

**NAL Call Number:** 41.8 AM3

**Descriptors:** cattle, humans, meat, meat products, milk, food contamination, *Mycobacterium bovis*, epidemiology, disease distribution, disease prevalence, disease transmission, zoonoses.

Oakey, J.; Forbes-Faulkner, J.; Gilpin, C.; Murdoch, B.; Johnson, S. **Pyogranuloma caused by *Mycobacterium asiaticum* infection in a steer.** *Journal of Veterinary Diagnostic Investigation*. 2005 July; 17 (4): 378-382. ISSN: 1040-6387

**NAL Call Number:** SF774.J68

**Abstract:** In 2003, a steer carcass was condemned at a Central Queensland abattoir because of metastatic tumors. In addition, a granulomatous lesion was found in the mediastinal lymph node. Histological examination showed this to be a pyogranuloma, typically associated with *Rhodococcus* or the *Nocardia/Streptomyces* group. However, in this case, the only etiological agent was an acid-fast bacillus, which would normally be associated with a more fibrous lesion. A number of nucleic acid-based techniques were used, and the isolate was identified as *Mycobacterium asiaticum*. This organism is a rarely encountered opportunistic pathogen of humans, associated with subtropical climates. This is the first report of this organism causing infection in cattle. The similarities between this case and cases of human disease are discussed.

**Descriptors:** cattle, steer, *Mycobacterium asiaticum*, granulomatous lesions, mycobacterial diseases, case study, neoplasms, inflammation, pathogenesis, disease diagnosis, pyogranuloma, Australia.

Olea-Popelka, F.J.; Flynn, O.; Costello, E.; McGrath, G.; Collins, J.D.; O'Keeffe, J.; Kelton, D.F.; Berke, O.; Martin, S.W. **Spatial relationship between strains in cattle and badgers in four areas in Ireland.** *Preventive Veterinary Medicine*. 2005; 71 (1-2): 57-70. ISSN: 0167-5877

**URL:**[http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503315/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503315/description#description)

**NAL Call Number:** SF601.P7

**Descriptors:** *Mycobacterium bovis* strains, cattle, *Meles meles*, badgers setts, centroid of a cattle farm, logistic model, spatial clusters of strains, can be both in cattle and badgers, wild animals as reservoirs, dynamics of badger movements, epidemiology, transmission of bacteria from badgers to cattle, 4 areas of Ireland.

Olea-Popelka, F.J.; Phelan, J.; White, P.W.; McGrath, G.; Collins, J.D.; O' Keffe, J.; Duggan, M.; Collins, D.M.; Kelton, D.F.; Berke, O; More, S.J.; Martin, S.W. **Quantifying badger exposure and the risk of bovine tuberculosis for cattle herds in county Kilkenny, Ireland.** *Preventive Veterinary Medicine*. 2006; 75 (1/2): 34-46.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503315/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503315/description#description)

**NAL Call Number:** SF601.P7

**Descriptors:** badgers (*Meles meles*), quantifying badger exposure, cattle, bovine tuberculosis risk, Ireland.

Oru C, E. **Meningoencephalitis tuberculosa in a Holstein Cow.** *Veterinary Pathology*. 2005 Nov; 42 (6): 856-858. ISSN: 0300-9858

**NAL Call Number:** 41.8 P27

**Abstract:** The gross and histopathologic lesions of meningoencephalitis tuberculosa in a 4-year-old Holstein cow showing clinical signs compatible with bovine spongiform encephalopathy are described in this report. Grossly, numerous gray to yellow, firm and caseous nodules were seen on the ventral surfaces of the brain and in the lateral and fourth ventricles. Histopathologically, foci of caseation and dystrophic mineralization were surrounded by multinucleated giant cells, epithelioid macrophages, plasma cells, lymphocytes and fibrous proliferation. Ziehl-Neelsen stains of the lesions revealed masses of slender acid-fast bacilli in the necrotic centers of lesions and within surrounding giant cells.

**Descriptors:** dairy cows, brain infection, histopathology, bovine tuberculosis, *Mycobacterium*, disease diagnosis, case study.

Palmer, Mitchell V.; Waters, W. Ray; Thacker, Tyler C.; Stoffregen, William C.; Thomsen, Bruce V.; Slaughter, Ralph E.; Jones, Stephen L.; Pitzer, Josh E.; Minion, F. Chris. **Experimental infection of reindeer (*Rangifer tarandus*) with *Mycobacterium bovis*: pathological & immunological findings.** *Proceedings. Annual Meeting of the United States Animal Health Association*. 2005; 108: 113-116. ISSN: 0082-8750

**URL:** <http://www.usaha.org/Meetings.aspx/>

**NAL Call Number:** 49.9 UN3R

**Descriptors:** reindeer (*Rangifer tarandus*), *Mycobacterium bovis*, bovine tuberculosis, experimental infection, disease pathology, disease process, immunological responses, diagnostic techniques.

Parra, A.; Larrasa, J.; Garcia, A.; Alonso, J.M.; Hermoso de Mendoza, J. **Molecular epidemiology of bovine tuberculosis in wild animals in Spain: A first approach to risk factor analysis.** *Veterinary Microbiology*. 2005 Oct. 31; 110 (3-4): 293-300. ISSN: 0378-1135

**URL:**[http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** *Mycobacterium bovis*, animal pathogenic bacteria, risk factors, epidemiology, bovine tuberculosis, wild animals, ungulates, genetic markers, hosts, loci, symptoms, seasonal variation, disease prevalence, molecular epidemiology, reproductive season, hunting season, Spain.

Pavlik, I.; Trcka, I.; Parmova, I.; Svobodova, J.; Melicharek, I.; Nagy, G.; Cvetnic, Z.; Ocepek, M.; Pate, M.; Lipiec, M. **Detection of bovine and human tuberculosis in cattle and other animals in six Central European countries during the years 2000-2004.** *Veterinarni Medicina*. 2005; 50 (7): 291-299. ISSN: 0375-8427

**Descriptors:** cattle, zoo animals, Bactrian camels (*Camelus ferus*) in Czech Republic, a Siberian tiger (*Panthera tigris f. altaica*) in Hungary, a bison (*Bison bison*), an eland (*Taurotragus oryx*) in Poland, a dromedary camel (*Camelus dromedarius*), two bison in Slovenia, in wild animals, wild boar, wild red deer, European bison, roe deer, skin testing, disease status, *Mycobacterium bovis*, 6 Central European countries, Croatia, the Czech Republic, Hungary, Poland, Slovakia, and Slovenia.

Pavlik, I.; Jahn, P.; Chvatal, O.; Kalova, L.; Matlova, L.; Dvorska, L.; Tremel, F.; Nesnalova, E.; Novotny, L.; Halouzka, R. **Plicni tuberkuloza u kone zpusobena puvodcem aviarni tuberkulozy. [Pulmonary tuberculosis in a horse**

**caused by the causal agent of avian tuberculosis.]** *Veterinarstvi*. 2005; 55 (3): 140-145. ISSN: 0506-8231. Note: In Czech with an English summary. ISSN: 0506-8231

**Descriptors:** horses, 16 year old mare, interstitial pneumonia, lung infection, case study, *Mycobacterium avium*, *Mycobacterium avium* ssp. *avium* serotype 2 and genotypes dnaJ+, IS901+ and IS1245+isolates, Commission Decision No. 2004/320/EC of 31 March 2004, free of bovine tuberculosis, sporadic findings, Czech Republic.

Pfeiffer, D.U. **TB: current status and control: a view from the outside.** *Cattle Practice*. 2005; 13 (4): 305-311. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, *Mycobacterium bovis*, eradication and control concerns, disease levels, UK.

Pollock, J.M.; Skuce, R.A.; Mackie, D.P.; Neill, S.D. **Bovine tuberculosis: research in Northern Ireland.** *Cattle Practice*. 2005; 13 (4): 301-303. ISSN: 0969-1251

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, Northern Ireland.

Pollock, J.M.; Welsh, M.D.; McNair, J. **Immune responses in bovine tuberculosis: towards new strategies for the diagnosis and control of disease.** *Veterinary Immunology and Immunopathology*. 2005 Oct. 18; 108 (1-2): 37-43. ISSN: 0165-2427. Note: Paper presented at the 7th International Veterinary Immunology Symposium Held July 25-30, 2004, Quebec, Canada.

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Descriptors:** cattle, bovine tuberculosis, immune response, disease diagnosis, disease control, *Mycobacterium bovis*, tuberculin, vaccines, diagnostic techniques, disease detection, literature reviews.

Sattelmair, H. **Die Tuberkulose des Rindes - ein Beitrag zur Geschichte der Haustierkrankheiten. [Tuberculosis of the Cattle - A Contribution to the History of Diseases in Domesticated Animals.]** Freie Universitat Berlin. Berlin, Germany. 2005. 211 pp. Note: A thesis in German with an English summary.

**Descriptors:** historical review, *Mycobacterium bovis*, cattle, clinical aspects of the disease, pathogenesis, epidemiology, epidemics, disease control, tuberculosis in animals, zoonotic diseases.

Skinner, Margot A.; Wedlock, D. Neil; de Lisle, Geoffrey W.; Cooke, Michèle M.; Tascon, Ricardo E.; Ferraz, Jose C.; Lowrie, Douglas B.; Vordermeier, H. Martin; Hewinson, R. Glyn; Buddle, Bryce M. **The order of prime-boost vaccination of neonatal calves with *Mycobacterium bovis* BCG and a DNA vaccine encoding mycobacterial proteins Hsp65, Hsp70, and Apa is not critical for enhancing protection against bovine tuberculosis.** *Infection and Immunity*. 2005; 73 (7): 4441-4444. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** Priming neonatal calves at birth with a *Mycobacterium bovis* bacillus Calmette-Guerin (BCG) vaccine and boosting with a DNA vaccine consisting of plasmids encoding mycobacterial antigens Hsp65, Hsp70, and Apa or the reverse prime-boost sequence induced similar levels of protection against experimental challenge with *Mycobacterium bovis*. When *M. bovis* was isolated from a thoracic lymph node following challenge, the two groups of calves given the prime-boost regimen had significantly lower numbers of *M. bovis* isolates than those vaccinated with BCG alone.

These observations suggest that the exact sequence of administration of a prime-boost vaccination regimen in a neonatal animal model is not critical to the development of immunity.

**Descriptors:** *Mycobacterium bovis*, neonatal animal model, calves, prime-boost vaccination regimen, development of immunity.

Underwood, S.C.; Carfagnini, J.C. **Comparacion de dos criterios para la interpretacion de la prueba tuberculínica cervical comparativa en caprinos. [Comparison between two criterions to interpret the tuberculin cervical comparative test in caprines.]** *Revista Argentina de Produccion Animal*. 2005; 25 (3/4): 199-205 ISSN: 0326-0550. Note: In Spanish with an English summary.

**Descriptors:** goats, caprine test, compare test results between cattle and goats, cervical comparative test, OOIE interpretation rules, criterion proposed by Garcia Marin and Gutierrez Cancela, differences were found, Argentina.

Veeregowda, B.M.; Isloor, S.; Leena, G.; Rajsekhar, M. **Assessment of an enzyme linked immunosorbent assay for detection of bovine tuberculosis.** *Journal of Veterinary Public Health*. 2005; 3(2): 111-114. ISSN: 0972-7485

**Descriptors:** cattle, *Mycobacterium bovis*, serum antibody detection, avidin-biotin ELISA, sensitivity and specificity were low, not suitable for a diagnostic tool.

Villarreal-Ramos, B.; McAulay, M.; Reed, S.; Prentice, H.; Coffey, T.; Cherleston, B.; Howard, C. **Effect of the nature of the antigen on the boosting of responses to mycobacteria in *M bovis* BCG vaccinated cattle.**

*Immunology*. 2005; 116 (Suppl. 1): 22. ISSN: 0019-2805. Note: A meeting abstract.

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0019-2805&site=1>

**NAL Call Number:** 448.3 IM6

**Descriptors:** cattle, antibody, antigen, BCG, immunologic drug, immunostimulant drug, vaccine, *Mycobacterium bovis* infection, bovine tuberculosis, animal pathogens, prevention and control, Th1 cell, immune system, Th2 cell.

Vordermeier, M.; Buddle, B.; Hewinson, R.G. **Development of cattle vaccines against bovine tuberculosis.**

*Research in Veterinary Science*. 2005; 78 (Suppl. A): 11-12. ISSN: 0034-5288. Note: A meeting abstract. 59th Annual Conference of the Association for Veterinary Teaching and Research Work, Scarborough, England; March 21 -23, 2005.

**URL:**[http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Descriptors:** cattle, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, DNA, vaccine antigens, tuberculosis vaccine, immunostimulant drug.

Vordermeier, -M; Goodchild, A; Clifton-Hadley, R; Rua, R. de la. **The interferon-gamma field trial: background, principles and progress.** *Cattle Practice*. 2005; 13 (4): 323-325. ISSN: 0969-1251. Note: Reprinted from

*Veterinary Record*. 2004; 155: 37-38.

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, *Mycobacterium bovis*, diagnosis, diagnostic techniques, disease prevalence, epidemiology, interferon, skin tests, tuberculin test, UK.

Wangoo, A.; Rhodes, S.; Gough, G.; Inglut, S.; Ackbar, R.; Spencer, Y.; Hewinson, R.G.; Vordermeier, M.; Johnson, L. **Low dose *Mycobacterium bovis* infection in cattle results in pathology resembling to that of high dose infection.**

*Research in Veterinary Science*. 2005; 78 (Suppl. A): 41. ISSN: 0034-5288 . Note: Meeting abstract. 59th Annual Conference of the Association for Veterinary Teaching and Research Work, Scarborough, England; March 21 -23, 2005

**URL:**[http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Descriptors:** cattle, *Mycobacterium bovis*, low dose infection, comparison to high dose infection, pathology, etiology, transmission.

Wangoo, A.; Johnson, L.; Gough, J.; Ackbar, R.; Inglut, S.; Hicks, D.; Spencer, Y.; Hewinson, G.; Vordermeier, M. **Advanced granulomatous lesions in *Mycobacterium bovis*-infected cattle are associated with increased expression of type I procollagen, gamma delta (WC1+) T cells and CD 68+ cells.** *Journal of Comparative Pathology*. 2005 Nov.; 133 (4): 223-234. ISSN: 0021-9975

*Pathology*. 2005 Nov.; 133 (4): 223-234. ISSN: 0021-9975

**NAL Call Number:** 41.8 J82

**Descriptors:** granuloma, disease course, gene expression, *Mycobacterium bovis*, type I procollagen, gamma delta (WC1+) T cells, CD 68+ cells.

Wedlock, D. Neil; Denis, Michel; Skinner, Margot A.; Koach, Jessica; de Lisle, Geoffrey W.; Vordermeier, H. Martin; Hewinson, R. Glyn; van Drunen Little van den Hurk, Sylvia; Babiuk, Lorne A.; Hecker, Rolf; Buddle, Bryce M.

**Vaccination of cattle with a CpG oligodeoxynucleotide-formulated mycobacterial protein vaccine and *Mycobacterium bovis* BCG induces levels of protection against bovine tuberculosis superior to those induced by vaccination with BCG Alone.** *Infection and Immunity*. 2005; 73 (6): 3540-3546. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The development of a subunit protein vaccine for bovine tuberculosis which could be used either in combination with *Mycobacterium bovis* BCG (to improve the efficacy of that vaccine) or alone would offer significant advantages over currently available strategies. A study was conducted with cattle to determine the protective efficacy

of a strategy based on concurrent immunization with an *M. bovis* culture filtrate (CFP) vaccine and BCG compared to vaccination with either vaccine alone. One group of calves (10 animals per group) was vaccinated subcutaneously with CFP formulated with Emulsigen and combined with a CpG oligodeoxynucleotide (ODN). A second group was vaccinated with both the CFP vaccine and BCG injected at adjacent sites (CFP-BCG). One further group was vaccinated subcutaneously with BCG, while another group served as nonvaccinated control animals. Vaccination with CFP-BCG induced levels of antigen-specific gamma interferon (IFN- $\gamma$ ) and interleukin-2 (IL-2) in whole-blood cultures that were higher than those induced by vaccination with BCG alone. The combination of CFP and BCG did not enhance the production of antibodies to *M. bovis* CFP compared to vaccination with CFP alone. Vaccination with CFP alone led to delayed antigen-specific IFN- $\gamma$  and IL-2 responses. Vaccination with CFP-BCG induced a high level of protection against an intratracheal challenge with virulent *M. bovis*, based on a significant enhancement of six pathological and microbiological parameters of protection compared with the nonvaccinated group. In contrast, vaccination with BCG alone induced a significant enhancement of protection in only one parameter, while CFP alone induced no protection. These results suggest that a combination of a CpG ODN-formulated protein vaccine and BCG offers better protection against bovine tuberculosis than does BCG alone.

**Descriptors:** bovine tuberculosis, subunit protein vaccine, development, *Mycobacterium bovis*, culture filtrate-based vaccine, BCG vaccine, calves, experimental model, efficacy of several regimens.

Wedlock, D.N.; Skinner, M.A.; De Lisle, G.W.; Vordermeier, H.M.; Hewinson, R.G.; Hecker, R.; Van Drunen-Little van den Hurk, S.; Babiuk, L.A.; Buddle, B.M. **Vaccination of cattle with *Mycobacterium bovis* culture filtrate proteins and CpG oligodeoxynucleotides induces protection against bovine tuberculosis.** *Veterinary Immunology and Immunopathology*. 2005; 106 (1-2) 53-63. ISSN: 0165-2427

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Descriptors:** cattle, *Mycobacterium bovis*, bovine tuberculosis, vaccination, culture filtrates, nucleotide sequences, disease prevention, vaccine adjuvants, immunomodulators, immune response, organic acids and salts, granulocyte macrophage colony stimulating factor, recombinant proteins, interferons, cell mediated immunity, bacterial antigens, subunit vaccines, molecular sequence data, CpG islands, polyinosinic acid, polycytidylic acid.

Welsh, Michael D.; Cunningham, Rodat T.; Corbett, David M.; Girvin, R Martyn; McNair, James; Skuce, Robin A.; Bryson, David G.; Pollock, John M. **Influence of pathological progression on the balance between cellular and humoral immune responses in bovine tuberculosis.** *Immunology*. 2005; 114 (1): 101-111. ISSN: 0019-2805. Online ISSN: 1365-2567

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0019-2805&site=1>

**NAL Call Number:** 448.3 IM6

**Descriptors:** cattle, *Mycobacterium bovis*, suppressed cell-mediated immune responses, and increased humoral responses, study on balance of evolving immune responses, pathogenesis, CD4 T-cell clones, increased ratio of Th0 [interleukin-4-positive/interferon-gamma-positive (IL-4(+)/IFN-gamma(+)) clones to Th1 (IFN-gamma(+)) clones.

Whelan, A.O.; Coad, M.; Cockle, P.J. Hewinson, R.G. Gordon, S; Vordermeier, H.M. **Comparative virulence and immunology of *M. tuberculosis* and *M. bovis* in cattle.** *Immunology*. 2005; 116 (Suppl. 1): 77. ISSN: 0019-2805. Note: Abstract, Annual Congress of the British Society for Immunology, Harrogate, England; December 06 -09, 2005

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0019-2805&site=1>

**NAL Call Number:** 448.3 IM6

**Descriptors:** cattle, humans, zoonotic diseases, bacterial pathogens, *Mycobacterium tuberculosis* Rv3879c-gene, *Mycobacterium bovis* Rv3879c gene, interferon-gamma; antigen, PPD, ESAT6, CFP10.

Winthrop, K.L.; Scott, J.; Brown, D; Jay, M.T.; Rios, R.; Mase, S.; Richardson, D.; Edmonson, A.; MacLean, M.; Flood, J. **Investigation of human contacts: a *Mycobacterium bovis* outbreak among cattle at a California dairy.** *International Journal of Tuberculosis and Lung Disease*. 2005; 9 (7): 809-813. ISSN: 1027-3719. Note: In English with summaries in French and Spanish.

**Descriptors:** dairy cattle, *Mycobacterium bovis*, dairy farms, occupational health study, working with infection animals, drinking raw milk, dairy workers, families, slaughterhouse workers, tuberculin skin test, disease-transmission; Mexican-American ethnic groups, human diseases milk-borne diseases, outbreaks, risk factors, tuberculosis, zoonoses, California, US.

- Woodroffe, R.; Donnelly, C.A.; Johnston, W.T.; Bourne, F.J.; Cheeseman, C.L.; Clifton-Hadley, R.S.; Cox, D.R.; Gettinby, G.; Hewinson, R.G.; Le Fevre, A.M. **Spatial association of *Mycobacterium bovis* infection in cattle and badgers *Meles meles***. *Journal of Applied Ecology*. 2005 Oct 42 (5 ): 852-862. ISSN: 0021-8901  
**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0021-8901&site=1>  
**NAL Call Number:** 410 J828  
**Descriptors:** cattle, badgers (*Meles Meles*), *Mycobacterium bovis*, bovine tuberculosis, strains, zoonoses, spatial distribution, disease prevalence, disease reservoirs, disease transmission, disease control, cluster analysis, Great Britain.
- Woolhouse, M.E.J. **Dangers of moving cows**. *Nature*. 2005; 435 (7041): 431-432. ISSN: 0028-0836  
**URL:** <http://www.nature.com/index.html>.  
**NAL Call Number:** 472 N21  
**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, animal transport, movement of animals, geographical distribution, disease transmission, badgers, epidemiology, Great-Britain.
- Zanini, M.S.; Moreira, E.C.; Salas, C.E.; Lopes, M.T.P.; Barouni, A.S.; Roxo, E.; Telles, M.A.; Zumarraga, M.J. **Molecular typing of *Mycobacterium bovis* isolates from south-east Brazil by spoligotyping and RFLP**. *Journal of Veterinary Medicine Series B*. 2005 Apr; 52 (3) 129-133. ISSN: 0931-1793  
**NAL Call Number:** 41.8 Z52  
**Descriptors:** dairy cattle, beef cattle, bovine tuberculosis, *Mycobacterium bovis*, pathogen identification, microbial genetics, strains, genetic polymorphism, molecular genetics, antibiotic resistance, diagnostic techniques, spoligotyping, ethionamide rifampicin, isoniazid, strain differences, disease surveillance, diagnostic-techniques, post slaughter tissue collection, identification of 163 strains, polymerase chain reaction (PCR) and microbiological tests, 252 tuberculous-like lesions, 3 genotyping techniques, IS6110-restriction fragment length polymorphism (RFLP), polymorphic guanine-cytosine-rich sequence (PGRS)-RFLP and direct repeat (DR)-spoligotyping, fails to show a correlation between main cluster found by the 3 techniques, Brazil.

## 2004

- Allsopp, B.A.; Babiuk, L.A.; Babiuk, S.L. **Vaccination: an approach to the control of infectious diseases**. In: J.A.W. Coetzer and R. C. Tustin (editors). *Infectious Diseases of Livestock*, Volume One. 2004; (Ed.2): Oxford University Press, Oxford, UK. 2004: 239-247. ISBN: 01915761693. Note: A book chapter.  
**Descriptors:** livestock animals, animal diseases, *Escherichia coli*, *Listeria monocytogenes*, *Mycobacterium bovis*, disease control measures, vaccination, live vaccines, DNA vaccines, inactivated vaccines, BCG vaccines, passive immunization, disease prevention and control.
- Asseged, B.; Woldesenbet, Z.; Yimer, E.; Lemma, E. **Evaluation of abattoir inspection for the diagnosis of *Mycobacterium bovis* infection in cattle at Addis Ababa abattoir**. *Tropical Animal Health and Production*. 2004; 36 (6): 537-546. ISSN: 0049-4747. Note: In English with summaries in French and Spanish.  
**URL:** <http://www.springerlink.com/content/103008/>  
**NAL Call Number:** SF601-.T7  
**Descriptors:** cattle, *Mycobacterium bovis*, slaughter, meat inspection, bovine tuberculosis, Ethiopia.
- Baptista, F.; Moreira, E.C.; Santos, W.L.M.; Naveda, L.A.B. **Prevalencia da tuberculose em bovinos abatidos em Minas Gerais. [Prevalence of tuberculosis in cattle slaughtered in Minas Gerais, Brazil.]** *Arquivo Brasileiro de Medicina Veterinaria e Zootecnia*. 2004; 56 (5): 577-580. ISSN: 0102-0935. Note: In Portuguese with an English summary.  
**Descriptors:** humans, slaughter cattle survey, *Mycobacterium bovis* disease levels, disease prevalence, epidemiology, geographical distribution, zoonoses, Minas Gerais, Brazil.
- Belgium Federal Agency for the Safety of the Food Chain. **Report on Zoonotic Agents in Belgium 2003: Working Group on Foodborne Infections and Intoxications**. Published by the Federal Agency for the Safety of the Food Chain (FASFC). Brussels. 2004; 74 pp.  
**Descriptors:** common disease agents, domestic and wild animals, zoonotic potential, *Mycobacterium bovis*, *Brucella melitensis*, *Brucella abortus*, *Brucella suis*, *Salmonella* spp., *Trichinella* spp., rabies virus, *Campylobacter* spp., *Echinococcus granulosus*, *Echinococcus multilocularis*, *Listeria monocytogenes*, *Yersinia enterocolitica*, verotoxin

producing *Escherichia coli* O157:H7, *Taenia saginata*, *Sarcocystis hominis*, *Sarcocystis suihominis*, *Toxoplasma gondii*, food borne illness, clinical aspects, routes of infection, recommendations, numbers of animals slaughtered in 2003, Belgium.

Bengis, R.G.; Kock, R.A.; Thomson, G.R.; Bigalke, R.D. **Infectious diseases of animals in sub-Saharan Africa: the wildlife/livestock interface.** In: J.A.W. Coetzer and R.C. Tustin (editors). *Infectious Diseases of Livestock, Volume One.* 2004; (Ed.2). Oxford University Press. Oxford. 2004: 225-238. ISBN: 01915761693. Note: A book chapter. **Descriptors:** cattle, goats, pigs, horses, dogs, wildlife diseases, ruminants, *Syncerus caffer*, animal diseases, epidemics, African horse sickness, African swine fever, anthrax, brucellosis, epidemiology, foot and mouth disease, bovine tuberculosis, malignant catarrhal fever, rabies, Rift Valley fever, rinderpest, trypanosomiasis, etc.

Collins, J.D.; Wall, P.G. **Food safety and animal production systems: controlling zoonoses at farm level.** *Revue Scientifique et Technique Office International des Epizooties.* 2004; 23 (2): 685-700. ISSN: 0253-1933. ISBN: 9290446218. Note: In English with Spanish and French summaries

**Descriptors:** *Brucella abortus*, *Campylobacter*, *Escherichia coli*, *Listeria monocytogenes*, *Mycobacterium avium* ssp *paratuberculosis*, *Mycobacterium bovis*, *Salmonella*, *Toxoplasma*, *Trichinella spiralis*, *Yersinia enterocolitica*, abortion, animal production, disease control, disease prevention, epidemiology, feeds, food chains, food contamination, food safety, hygiene, paratuberculosis, risk assessment, selection pressure; stress to animals in transport, tuberculosis, zoonoses.

Cvetnic, Z.; Spiic, S.; Katalinic-Jankovic, V.; Capek, B.; Habrun, B.; Mitak, M. **Primjena metode DNK u dijagnostici i identifikaciji kompleksa *Mycobacterium tuberculosis* u domacih zivotinja. [Application of a DNA method for the diagnosis and identification of *Mycobacterium tuberculosis* complex in domestic animals.]** *Veterinarska Stanica.* 2004; 35 (5/6): 261-268. ISSN: 0350-7149. Note: In Croatian with an English summary.

**Descriptors:** cows, pigs, tuberculosis, clinical aspects, animal slaughtered, *Mycobacterium bovis*, *Mycobacterium* spp., diagnosis, multiplication of DNA sequence of the gene coding 65kD antigen, PCR, Croatia, Yugoslavia, Serbia, Montenegro.

Diguimbaye, C.; Schelling, E.; Pfyffer, G.E.; Baggi, F.; Ngandolo, R.; Ndoutamia, G.; Tanner, M.; Zinsstag, J. **Premiers isolements de mycobacteries tuberculeuses chez l'homme et l'animal au Tchad. [First isolation of tuberculous mycobacteria in man and animals in Chad.]** *Medecine Tropicale.* 2004; 64 (5): 482-485. ISSN: 0025-682X. Note: In French with an English summary.

**Descriptors:** first isolation and identification of *Mycobacterium bovis*, *Mycobacterium tuberculosis*, antibiotic resistance, pyrazinamide, control policies needed, Chad.

Erler, W.; Martin, G.; Sachse, K.; Naumann, L.; Kahlau, D.; Beer, J.; Bartos, M.; Nagy, G.; Cvetnic, Z.; Zolnir-Dovc, M.; Pavlik, I. **Molecular fingerprinting of *Mycobacterium bovis* subsp. *caprae* isolates from Central Europe.** *Journal of Clinical Microbiology.* 2004; 42 (5): 2234-2238. ISSN: 095-1137

**URL:** <http://jcm.asm.org/cgi/content/short/42/5/2234>

**Descriptors:** cattle, humans, *Mycobacterium bovis* ssp *caprae*, 79 European isolates, dissemination of pathogen, spoligotyping, ES6110 RFLP analysis, type C1 predominant, 11 different spoligotypes, 43 different RFLP types identified, DNA fingerprinting, zoonotic diseases.

Fritsche, A.; Engel, R.; Buhl, D.; Zellweger, J.P. ***Mycobacterium bovis* tuberculosis: from animal to man and back.** *International Journal of Tuberculosis and Lung Disease.* 2004; 8 (7): 903-904. ISSN: 1027-3719. Note: In English with French and Spanish summaries.

**Descriptors:** humans, cattle, other infected animals, *Mycobacterium bovis*, strains, zoonotic disease, disease transmission from animal to human and back to animal, case reports, clinical aspects, disease course, disease transmission, exposure, human diseases, strains, tuberculosis, Switzerland.

Gormley, E.; Doyle, M.B.; McGill, K.; Costello, E.; Good, M.; Collins, J.D. **The effect of the tuberculin test and the consequences of a delay in blood culture on the sensitivity of a gamma-interferon assay for the detection of *Mycobacterium bovis* infection in cattle.** *Veterinary Immunology and Immunopathology.* 2004; 102 (4): 413-420. ISSN: 0165-2427

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Descriptors:** cattle, tuberculin testing, *Mycobacterium bovis*, gamma interferon assay, detection of *Mycobacterium bovis*, blood culture.

Gunn-Moore, D. **Investigating feline tuberculosis.** *Veterinary Times*. 2004; 34 (13): 10. ISSN: 1352-9374

**Descriptors:** cats, cattle, humans, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium microti*, disease prevalence, disease transmission between species, epidemiology, risk factors, disease spread, zoonoses.

Joardar, S.N.; Ram, G.C.; Goswami, T.K. **Kinetics of seroreactivity of *Mycobacterium bovis* AN5 culture filtrate antigens in experimental bovine tuberculosis.** *Indian Journal of Animal Health*. 2004; 43(1): 19-26. ISSN: 0019-5057

**Descriptors:** *Mycobacterium bovis* AN5, serodiagnosis, kinetics of seroreactivity, cattle, experimental infection, antibody level/titre, ELISA, 0-45 days post inoculation, sensitized animals, Western blot analysis, various polypeptide weights, immunodominant polypeptides.

Jordao Junior, C.M. ***Mycobacteria* research in water buffalo milk.** *Revista do Instituto Adolfo Lutz*. 2004; 63 (2): 273. ISSN: 0073-9855

**Descriptors:** water buffalo, *Bubalus bubalis*, milk products, microflora in milk, humans, zoonotic diseases, *Mycobacterium intracellulare*, *Mycobacterium simiae*, *Mycobacterium bovis*, strain JI321 e JB22, strain INS eINS2, strain AN5, *Mycobacterium flavescens*.

Katoch, R.C.; Madhumeet Singh; Subhash Verma; Gupta, V.K.; Mandeep Sharma; Vineeta Almadi. **Genital tuberculosis in a Jersey crossbred cow.** *Indian Veterinary Journal*. 2004; 81(2): 216-217. ISSN: 0019-6479  
**NAL Call Number:** 41.8 IN2

**Descriptors:** cattle, Jersey cross bred cow, *Mycobacterium bovis*, *Staphylococcus aureus*, genital area lesions, histopathology, diagnosis mixed infections, case reports, clinical aspects, Himachal Pradesh, India.

Koo, Hye Cheong; Park, Yong Ho; Ahn, Jongsam; Waters, W. Ray; Hamilton, Mary Jo; Barrington, George; Mosaad, Abdelaziz A.; Palmer, Mitch V.; Shin, Sang; Davis, William C. **New latex bead agglutination assay for differential diagnosis of cattle infected with *Mycobacterium bovis* and *Myobacterium avium* subsp. *paratuberculosis*.** *Clinical and Diagnostic Laboratory Immunology*. 2004; 11 (6): 1070-1074. ISSN: 1071-412X

**Descriptors:** cattle, identification of animals infected with *Mycobacterium bovis*, *Mycobacterium avium* ssp. *paratuberculosis*, current assays not sensitive and specific to identify diseased animals, latex bead agglutination assay (LBAA) using specific immunodominant epitope (ESAT6-p) of *M. bovis*, compared assay to culture method and skin test, experimental infection and non-infected animals, species specific diagnosis, sera testing, data suggest a rapid, sensitive and specific assay can be developed.

Larson, Jean A.; Animal Welfare Information Center (U.S.). **Tuberculosis in animals : *Mycobacterium* bacilli that cause devastating zoonotic diseases in many animals.** *AWIC Resource Series; no. 2004-01*. U.S. Dept. of Agriculture, Agricultural Research Service, National Agricultural Library, Animal Welfare Information Center. Beltsville, MD [2004]

**URL:** <http://www.nal.usda.gov/awic/pubs/TB/TBMain.htm>

**NAL Call Number:** aHV4701.A94 no. 2004-01

**Abstract:** The focus of this publication is on information related to tubercular diseases of animals caused by the bacterial genus *Mycobacterium*. Livestock diseases are mostly caused by *Mycobacterium bovis* and the *Mycobacterium tuberculosis* complex. Many species of animals are included: large ruminants, wildlife, wild animals as disease reservoirs, deer, elephants, birds, fish, etc. Topics are varied and include clinical aspects of the disease, the disease process, disease prevention and control, vaccines, immunology, bacterial genetics, zoonotic aspects, etc.

Diseases: tuberculosis in animals, bibliography, *Mycobacterium* sp, *Mycobacterium avium*, *Mycobacterium bovis*, zoonoses, production animals, zoo animals, wild animals, disease control, *Mycobacterium tuberculosis* complex, microbial genetics, disease incidence worldwide, control programs worldwide, immune response, wild animal vectors, treatments, animal disease models, aquatic animals, diagnostic methods, disease pathology, disease incidence worldwide.

Laval, G.; Ameni, G. **Prevalence of bovine tuberculosis in zebu cattle under traditional animal husbandry in Boji district of western Ethiopia.** *Revue de Medecine Veterinaire*. 2004; 155 (10): 494-499. ISSN: 0035-1555. Note: In

English with an English summary.

**Descriptors:** zebu cattle, 62 herds, 780 individuals, animal prevalence, *Mycobacterium bovis*, single intradermal tuberculin test, comparative intradermal tuberculin test, risk of transmission to humans, Boji district, Ethiopia.

Lucca, E.; Canal, A.M.; Pachoud, J.C.; Gollan, A.; Bergamasco, M.; Latini, M.; Lopez, M.; Nicola, A.; Tomatis, I.; Scarpin, V. **Diagnostico de tuberculosis bovina: correlacion entre pruebas diagnosticas. [Diagnosis of bovine tuberculosis: correlation between different diagnostic tests.]** *Veterinaria Argentina*. 2004; 21 (203): 196-203. ISSN: 0326-4629. Note: In Spanish with an English summary.

**Descriptors:** dairy cattle; *Mycobacterium bovis*; blood sampling, diagnostic tests; correlation between tuberculin skin test, bacteriological cultures, microscopic lesions of lymph nodes and other organs, and interferon-gamma assay; interferon-gamma assay not sufficient at detecting *M. bovis*, Argentina.

Lutze-Wallace, C.; Chen, S.; Turcotte, C. **Laboratory diagnosis of bovine tuberculosis in Canada for calendar year 2003.** *Canadian Veterinary Journal*. 2004; 45(11): 915-916. ISSN: 0008-5286

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=202>

**NAL Call Number:** 41.8 R3224

**Descriptors:** cattle, bison, pigs, diagnosis, disease prevalence, disease surveys, epidemiological surveys, epidemiology, laboratory diagnosis, tuberculosis, wild animals, zoo animals, *Mycobacterium avium* subsp *avium*, *Mycobacterium flavescens*, *Mycobacterium gordonae*, *Mycobacterium triviale*, *Cervus elaphus Canadensis*, red deer, fallow deer, *Mycobacterium avium*, *Mycobacterium avium* subsp *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium chelonae*, *Mycobacterium fortuitum*, *Mycobacterium marinum*, *Mycobacterium terrae*, *Mycobacterium xenopi*, *Odocoileus virginianus*, pigs, Canada.

Lyashchenko, K.; Whelan, A.O.; Greenwald, R.; Pollock, J.M.; Andersen, P.; Hewinson, R.G.; Vordermeier, H.M. **Association of tuberculin-boosted antibody responses with pathology and cell-mediated immunity in cattle vaccinated with *Mycobacterium bovis* BCG and infected with *M. bovis*.** *Infection and Immunity*. 2004; 72 (5): 2462-2467. ISSN: 0019-9567

**URL:** <http://iai.asm.org/cgi/content/full/72/5/2462>

**NAL Call Number:** QR1 I57

**Abstract:** Vaccine development and our understanding of the pathology of bovine tuberculosis in cattle would be greatly facilitated by definition of the immunological correlates of protection and/or pathology. In this study we analyzed humoral immune responses in *Mycobacterium bovis* BCG-vaccinated and control cattle (in particular, the relationship between the intradermal comparative tuberculin skin test and serum immunoglobulin G [IgG] responses) against a range of mycobacterial antigens (MPB59, MPB64, MPB70, MPB83, ESAT-6, CFP-10, Acr1, and PstS-1) by multiantigen print immunoassay and conventional enzyme-linked immunosorbent assay. Following *M. bovis* infection, the comparative tuberculin skin test strongly boosted IgG, IgG1, and IgG2 antibody responses, particularly against MPB83 and MPB70, in unvaccinated cattle but failed to boost these responses, or did so only weakly, in BCG-vaccinated calves. In addition, the skin test-induced increases in MPB83-specific IgG responses correlated positively with bacterial loads and ESAT-6-induced in vitro gamma interferon responses. In conclusion, both the negative correlation of skin test-enhanced MPB83-specific antibody responses with BCG-induced protection and their positive correlation with bacterial loads can serve as useful markers for vaccine efficacy after challenge.

**Descriptors:** cattle, *Mycobacterium bovis*, experimental infections, immune response, antibodies, antigens, cell mediated immunity, humoral immunity, IgG, immunization, interferon, tuberculin skin tests, vaccination, vaccines.

Mackintosh, C.G.; Lisle, G.W. de; Collins, D.M.; Griffin, J.F.T. **Mycobacterial diseases of deer.** *New Zealand Veterinary Journal*. 2004; 52 (4): 163-174. ISSN: 0048-0169

**URL:** <http://www.vetjournal.org.nz/nzvet.html>

**NAL Call Number:** 41.8 N483

**Descriptors:** captive farmed deer, *Mycobacterium avium* complex, *Mycobacterium avium* subsp *paratuberculosis*, *Mycobacterium bovis*, diagnosis, disease prevention and control, epidemiology, mycobacteria diseases, zoonotic diseases, paratuberculosis, literature reviews, New Zealand.

Magnano, G.; Urbani, C.; Schneider, M.; Giraudo, J. **Tuberculosis caprina: comparacion entre animales positivos a la prueba de intradermorreaccion y la presencia de lesiones y/o aislamiento. [Tuberculosis in goats: comparison between positivity to the skin test, pathological lesions and bacteriological cultures.]** *Veterinaria Argentina*. 2004;

21 (208): 570-576. ISSN: 0326-4629. Note: In Spanish with an English summary.

**Descriptors:** goats, *Mycobacterium bovis*, diagnostic testing, diagnostic techniques, disease survey, disease prevalence, reliability of skin tests, postmortem tissue sampling, in vitro culture, comparison study, animal pathology, Argentina.

Maue, Alexander C.; Waters, W. Ray; Palmer, Mitchell V.; Whipple, Diana L.; Minion, F. Chris; Brown, Wendy C.; Estes, D. Mark. **CD80 and CD86, but not CD154, augment DNA vaccine-induced protection in experimental bovine tuberculosis.** *Vaccine*. 2004; 23 (6): 769-779. ISSN: 0264-410X

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/30521/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/30521/description#description)

**Descriptors:** cattle, enhancing immune response, *Mycobacterium bovis* BCG, vaccination, aerosol challenge with virulent *M. bovis*, co stimulatory molecules, CD154, CD80, CD86, CpG-ODN, DNA vaccination, anti-infective drug, adverse effects, efficacy, intravenous administration; subunit DNA vaccine ESAT-6, interferon-gamma, disease prevention and control.

McCorry, T.P.; McCormick, C.M.; Hughes, M.S.; Pollock, J.M.; Neill, S.D. ***Mycobacterium nonchromogenicum* in nasal mucus from cattle in a herd infected with bovine tuberculosis.** *Veterinary Microbiology*. 2004; 99 (3/4): 281-285. ISSN: 0378-1135

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** cattle herds, *Mycobacterium nonchromogenicum*, *Mycobacterium bovis*, genotypes, nucleotide sequences, skin tests, blood sampling, antibody ELISA, interferon-gamma assay, radiometric culture of nasal mucus samples, DNA probe testing Accuprobe, *M. tuberculosis* PCR amplification, 16S rRNA PCR, sequence analysis, first report of *M. nonchromogenicum* in nasal mucus of cattle, zoonotic risks.

McKenzie, J.S.; Morris, R.S.; Pfeiffer, D.U.; Meenken, D.; Lambie, J. **Application of GIS and landscape epidemiology to TB control in possums.** *GISVET' 04: Second International Conference on the Applications of GIS and Spatial Analysis to Veterinary Science, University of Guelph, Ontario, Canada, 23<sup>rd</sup> 25<sup>th</sup> June*. 2004: 78-80.

ISBN: 189951323X. Note: Published by Veterinary Laboratories Agency. Addlestone, UK

**Abstract:** The EpiCentre, of Massey University used a farm level land forms survey epidemiological techniques to identify habitat and topographic risk factors associated with the distribution of TB infected possum clusters, of residual possums following culling and possum TB risk. These results were to develop geographic models within a GIS using satellite-derived habitat data to facilitate a risk-based approach to TB management in New Zealand.

**Descriptors:** cattle, *Mycobacterium bovis*; brushtail possum (*Trichosurus vulpecula*), disease surveillance methods, wildlife disease reservoir, epidemiology, geographic information systems, GIS, New Zealand.

Mirsojev, D.M.; Drauschke, W. **Spread of tuberculosis in cattle stocks in various areas of Tajikistan.** *Journal of Agriculture and Rural Development in the Tropics and Subtropics*. 2004; 105 (2): 197-200. ISSN: 0041-3186. Note: In Russian with an English summary.

**Descriptors:** cattle, tuberculosis levels 1943-1994, *Mycobacterium bovis*, inadequate veterinary measures, insufficient diagnosis of cattle, lack of long term control of infected animals, disease prevention and control at the farm level, sanitation practices improved, zoonotic risks of transmission to humans, Republic of Tajikistan.

Mota, P.M.P.C.; Motta, P.M.C.; Lobato, F.C.F.; Lage, A.P.; Ribeiro, A.C.C.L.; Leite, R.C. **Avaliacao do tratamento com isoniazida em bovinos infectados naturalmente pelo *Mycobacterium bovis*. [Evaluation of isoniazid treatment carried in cattle naturally infected with *Mycobacterium bovis*.]** *Arquivo Brasileiro de Medicina Veterinaria e Zootecnia*. 2004; 56 (5): 581-588. ISSN: 0102-0935. Note: In Portuguese with an English summary.

**Descriptors:** naturally infected cattle herd, 240 animals, humans, *Mycobacterium bovis*, intermittent drug treatment, isoniazid, oral dosing 3x/week, zoonotic disease.

Nita, C. **Diagnosticul tuberculozei la bovine in judetul Vaslui prin testul imunoenzimatic-procedeul sandwich pentru detectarea gamma-interferonului. [The diagnosis of bovine tuberculosis in Vaslui District by an enzyme immunoassay for detection of gamma-interferon.]** *Revista Romana de Medicina Veterinara*. 2004; 14 (3): 149-154. ISSN: 1220-3173. Note: In Romanian with an English summary.

**Descriptors:** cattle, testing intradermal reaction, enzyme immunoassay follow up, gamma interferon, in vitro stimulated blood samples, diagnostic techniques, disease prevalence and control, *Mycobacterium bovis*, epidemiology, Strategic program for Supervision and Control of Bovine Tuberculosis, Vaslui District, Romania.

Norby, B.; Bartlett, P.C.; Fitzgerald, S.D.; Granger, L.M.; Bruning-Fann, C.S.; Whipple, D.L.; Payeur, J.B. **The sensitivity of gross necropsy, caudal fold and comparative cervical tests for the diagnosis of bovine tuberculosis.** *Journal of Veterinary Diagnostic Investigation*. 2004; 16 (2): 126-131. ISSN: 1040-6387

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** 22 cattle herds, *Mycobacterium bovis*, complement fixation tests, diagnosis, diagnostic techniques, diagnostic value of several tests, gross necropsy, histological exam, mycobacterial culture, PCR assay of samples suspected of bTb, sensitivity of caudal fold and comparative cervical skin tests, tests compared, disease control, culling, depopulation, zoonoses, northeast corner of Michigan's lower peninsula.

Palmer, M.V.; Waters, W.R.; Whipple, D.L.; Slaughter, R.E.; Jones, S.L. **Evaluation of an in vitro blood-based assay to detect production of interferon-gamma by *Mycobacterium bovis*-infected white-tailed deer (*Odocoileus virginianus*).** *Journal of Veterinary Diagnostic Investigation*. 2004; 16 (1): 17-21. ISSN: 1040-6387

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** deer (*Odocoileus virginianus*), *Mycobacterium bovis*, captive Cervidae added to the USDA Uniform Methods and Rules for eradication of bovine tuberculosis, wild animals as a disease reservoir, testing potential of a new blood-based assay for Cervidae, animal welfare, reduced handling, stress and injury and death, experimental inoculation, 300 colony forming units. tonsillar crypts, young males and females, serial blood collection up to 307 days, analyzed for production of *M. bovis*, PPD<sub>b</sub>, *M. avium* PPD<sub>a</sub>, pokeweed mitogen or media alone, PPD<sub>b</sub> may serve diagnostic technique ante mortem, Michigan.

Pate, Mateja; Zdovc, Irena; Pirs, Tina; Krt, B.; Ocepek, M. **Isolation and characterisation of *Mycobacterium avium* and *Rhodococcus equi* from granulomatous lesions of swine lymph nodes in Slovenia.** *Acta Veterinaria Hungarica*. 2004; 52 (2): 143-150. ISSN: 0236-6290

**Descriptors:** cattle, swine, lymph nodes, mixed infections, *Mycobacterium hominissuis* (IS901-, IS1245+ genotype), *Mycobacterium avium avium* (IS901+, IS1245+ genotype), typed using IS1245, IS901 and FR300 PCR, *Rhodococcus equi* isolates, tested for virulence-associated antigens (VapA and VapB).

Pavlik, I.; Jahn, P.; Dvorska, L.; Bartos, M.; Novotny, L.; Halouzka, R. **Mycobacterial infections in horses: a review of the literature.** *Veterinarni Medicina*. 2004; 49 (11): 427-440. ISSN: 0375-8427

**Descriptors:** horses, mycobacterial infections, *Mycobacterium avium* complex, *Mycobacterium tuberculosis*, *Mycobacterium avium* ssp *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium chelonae*, *Mycobacterium fortuitum*, *Mycobacterium smegmatis*, *Mycobacterium terrae*, *Mycobacterium africanum*, *Mycobacterium microti*, clinical signs, epidemiological relationships, atypical disease course, diagnosis, diagnostic techniques, disease-prevalence, disease transmission, epidemiology, histopathology, molecular genetics, risk-factors, serotypes, taxonomy, zoonoses, literature review, seen in Central Europe.

Perez, A; Debenedetti, R; Martinez-Vivot, M; Bernardelli, A.; Torres, P.; Ritacco, V. **Tendencia de la tuberculosis porcina y validez de la inspeccion bromatologica para su deteccion en areas de produccion intensiva de la Argentina. [Swine tuberculosis in Argentina: the value of the bromatologic inspection in an intensive swine production area.]** *Revista de Medicina Veterinaria Buenos Aires*. 2004; 85 (2): 61-64. ISSN: 0325-6391. Note: In Spanish with an English summary.

**Descriptors:** pigs, intensive production systems, *Mycobacterium bovis*, diagnosis, disease prevalence, disease control, post slaughter examinations, abattoirs, carcass condemnation, carcasses, disease control, disease surveys, disease transmission, epidemiology, histopathology, monitoring, Argentina.

Pun, M.B.; Prasai, T.P.; Mermagya-Dhakal; Jha, V.K.; Shrestha, K.B.; Jha, V.C.; Sato, T.; Morita, Y.; Kozawa, K.; Kimura, H. **Single intradermal tuberculin tests of milking buffaloes and cows in Nepal.** *Veterinary Record* (London). 2004; 154 (4): 124. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/>

**NAL Call Number:** 41.8 V641

**Descriptors:** buffalo, cattle, cows, humans, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, *Mycobacterium africanum*, *Mycobacterium canetti*, *Mycobacterium microti*, disease prevalence, disease transmission from animals to humans, zoonotic aspects, intradermal tuberculin test.

Retamal, P.I.; Abalos, P.E. **Comparacion del ensayo de interferon gamma bovino con tecnicas tradicionales para el diagnostico de infeccion con *Mycobacterium bovis* en la Region Metropolitana de Chile.** [Comparison of the bovine gamma-interferon assay with traditional techniques for detecting infection with *Mycobacterium bovis*.] *Revista Colombiana de Ciencias Pecuarias*. 2004; 17(3): 223-230. ISSN: 0120-0690. Note: In Spanish with an English summary.

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, assays, detection, diagnosis, diagnostic techniques, interferon.

Ritelli, M.; Amadori, M.; Dondo, A.; Begni, B.; Zoppi, S.; Archetti, I.L. **Combined use of the g-interferon and interleukin-2 receptor assays for diagnosis of bovine tuberculosis.** *Online Journal of Veterinary Research*. 2004; 8: 16-21. ISSN: 1328-925X

**Abstract:** The g-interferon assay for bovine tuberculosis has reached wide acceptance in many countries. Yet, less than optimal specificity in some areas and a certain percentage of inconclusive results may affect this diagnostic technique. The problem of inconclusive results can be approached by a two-stage procedure, whereby peripheral blood mononuclear cells of g-interferon dubious samples are later analysed for expression of the interleukin-2 receptor; this had been validated as a further alternative marker of cell-mediated immunity in *M. bovis*-infected cattle. This way, the two assays are used sequentially on the same blood samples. As a result, further diagnostic information can be obtained without new blood samplings in the field. The results of the interleukin-2 receptor assay showed a high correlation with those of the g-interferon assay. Instead, there was no clear evidence of increased specificity under the conditions reported in this study.

**Descriptors:** cattle, *Mycobacterium bovis*, blood sampling, peripheral blood mononuclear cells, diagnostic assay, cell mediated immunity g-interferon, interleukin-2.

Scantlebury, M.; Hutchings, M.R.; Allcroft, D.J.; Harris, S. **Risk of disease from wildlife reservoirs: badgers, cattle, and bovine tuberculosis.** *Journal of Dairy Science*. 2004; 87 (2): 330-339. ISSN: 0022-0302

**URL:** <http://jds.fass.org/contents-by-date.0.shtml>

**NAL Call Number:** 44.8 J822

**Descriptors:** dairy cows, disease-reservoirs, wildlife livestock relations, badgers, *Meles meles*, *Mycobacterium bovis*, cattle grazing intensity, rotational grazing, strip grazing, animal behavior, risk assessment, England.

Shkaeva, N.A. **Spread of bovine tuberculosis in a radiocontaminated area of Chelyabinsk Oblast.** *Russian Agricultural Sciences*. 2004; (4): 30-32. ISSN: 1068-3674. Note: Translated from *Doklady Rossiiskoi Akademii Sel'skokhozyaistvennykh Nauk* (2004) No. 2: 41-43 (Ru). Publisher is AllertonPress, Inc, NY, NY

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, relationship between epizootic situation and local radioactive waste contamination, soil pollution, study 1984-2002, high level of disease, remedial measures taken, positive relationship between disease and contamination, Russia.

Singh, B.B.; Sharma, S.; Kumar, H.; Dhand, N.K. **Surveillance of diseases in organized dairy farms of Punjab.** *Journal of Research, Punjab Agricultural University*. 2004; 41 (4): 490-494. ISSN: 0048-6019.

**Descriptors:** 3 dairy cattle farms, health status monitoring, disease prevalence, various diseases, brucellosis, infectious bovine rhinotracheitis, bovine tuberculosis 2.13%, Johne's disease, theileriosis, trypanosomiasis, babesiosis, disease prevention, various disorders mentioned, Punjab, India.

Singh, S.K.; Rishendra Verma; Shah, D.H. **Molecular fingerprinting of clinical isolates of *Mycobacterium bovis* and *Mycobacterium tuberculosis* from India by restriction fragment length polymorphism (RFLP).** *Journal of Veterinary Science*. 2004; 5 (4): 331-335. ISSN: 1229-845X

**Descriptors:** humans, animals, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, disease transmission between species, 40 mycobacterial strains, clinical and field isolates, RFLP, IS6110 and IS1081 probes, dairy cattle herds, patients, Indian Veterinary Research Institute campus, strains and species compared, India.

Smith, Robert M.M.; Drobniowski, Francis; Gibson, Andrea; Montague, John D.E.; Logan, Margaret N.; Hunt, David; Hewinson, Glyn; Salmon, Roland L.; O'Neill, Brian. ***Mycobacterium bovis* infection, United Kingdom.** *Emerging Infectious Diseases*. 2004; 10 (3): 539-541. ISSN: 1080-6040

**URL:** <http://www.ncbi.nlm.nih.gov/sites/entrez?linkbar=plain&db=journals&term=1080-6040>

**NAL Call Number:** RA648.5.E46

**Descriptors:** cattle, bacterial disease, zoonotic aspects, bovine tuberculosis transfer to humans, disease transmission, UK.

Sreedevi, B.; Krishnappa, G. **Standardization of polymerase chain reaction for the detection of *Mycobacterium tuberculosis* complex organisms from bovines.** *Indian Journal of Animal Sciences*. 2004; 74 (11): 1120-1123.

ISSN: 0367-8318

**NAL Call Number:** 41.8 IN22

**Descriptors:** cattle, *Mycobacterium tuberculosis* complex, *Mycobacterium bovis*, *Mycobacterium avium*, *Mycobacterium phlei*, polymerase chain reaction, PCR, laboratory techniques, genetic techniques, biopsy, diagnostic techniques, Bangalore, India.

Teklu, A.; Asseged, B.; Yimer, E.; Gebeyehu, M.; Woldesenbet, Z. **Tuberculous lesions not detected by routine abattoir inspection: the experience of the Hossana municipal abattoir, southern Ethiopia.** *Revue Scientifique et Technique Office International des Epizooties*. 2004; 23 (3): 957-964. ISSN: 0253-1933.

**Descriptors:** detection of tuberculous cattle, routine post slaughter inspection, tissues collection, testing for *Mycobacterium bovis*, 4.5% found to have tuberculous lesions, routine plant inspections found fewer, lungs and thoracic lymph nodes, obvious need for a higher level of accuracy at necropsy.

Thom, M.; Morgan, J.H.; Hope, J.C.; Villarreal-Ramos, B.; Martin, M.; Howard, C.J. **The effect of repeated tuberculin skin testing of cattle on immune responses and disease following experimental infection with *Mycobacterium bovis*.** *Veterinary Immunology and Immunopathology*. 2004; 102 (4): 399-412. ISSN: 0165-2427

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Descriptors:** cattle, tuberculin testing, repeated skin testing, immune responses to testing, experimental infection with *Mycobacterium bovis*.

UK, Department for Environment Food and Rural Affairs. **Zoonoses Report United Kingdom 2003.** Published by the Department of Environment, Food and Rural Affairs (DEFRA). 2004; 71 ISBN: 0855211407

**URL:** [www.defra.gov.uk](http://www.defra.gov.uk)

**Descriptors:** humans cattle, livestock, avian influenza, bovine spongiform encephalopathy, Creutzfeldt Jakob disease, disease prevalence, disease surveys, disease transmission, epidemiology, foodborne diseases, vector borne diseases, waterborne diseases, West Nile fever, *Borrelia*, *Campylobacter*, *Cryptosporidium*, *Escherichia coli*, Hantavirus, *Leptospira*, *Listeria*, *Mycobacterium bovis*, Salmonella, *Streptococcus*, *Toxocara*, *Toxoplasma*, *Trichinella*, zoonoses, UK.

Vesosky, B.; Turner, O.C.; Turner, J.; Orme, I.M. **Gamma interferon production by bovine gammadelta T cells following stimulation with mycobacterial mycolylarabinogalactan peptidoglycan.** *Infection and Immunity*. 2004; 72 (8): 4612-4618. ISSN: 0019-9567

**URL:** <http://iai.asm.org>

**NAL Call Number:** QR1.I57

**Abstract:** A large percentage of lymphocytes in the blood of cattle express the gammadelta T-cell receptor, but specific functions for these cells have not yet been clearly defined. There is evidence, however, that human, murine, and bovine gammadelta T-cells have a role in the immune response to mycobacteria. This study investigated the ability of bovine gammadelta T-cells to expand and produce gamma interferon (IFN-gamma) in response to stimulation with mycobacterial products. Bovine gammadelta T-cells, isolated from the peripheral blood of healthy cattle, expanded following in vitro stimulation with live mycobacteria, mycobacterial crude cell wall extract, and *Mycobacterium bovis* culture filtrate proteins. In addition, purified gammadelta T-cells, co-cultured with purified monocytes and interleukin-2, consistently produced significant amounts of IFN-gamma in response to mycobacterial cell wall. The IFN-gamma-inducing component of the cell wall was further identified as a proteolytically resistant, non-sodium dodecyl sulfate-soluble component of the mycolylarabinogalactan peptidoglycan.

**Descriptors:** cattle, gamma interferon production, bovine gammadelta T cells, lymphocytes, ability to expand and produce IFN-gamma, stimulation, live mycobacteria, mycobacterial crude cell wall extract, *Mycobacterium bovis* culture filtrate, cell biochemistry.

Vordermeier, M.; Goodchild, A.; Clifton-Hadley, R.; Rua, R.de la. **The interferon-gamma field trial: background,**

**principles and progress.** *Veterinary Record.* 2004; 155 (2): 37-38

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculin skin tests, interferon-gamma test, latent infections, diagnostic techniques, disease course, histopathology, cell mediated immune response, immunodiagnosis.

Waters, W.R.; Nonnecke, B.J.; Palmer, M.V.; Robbe-Austermann, S.; Bannantine, J.P.; Stabel, J.R.; Whipple, D.L.; Payeur, J.B.; Estes, D.M.; Pitzer, J.E.; Minion, F.C. **Use of recombinant ESAT-6:CFP-10 fusion protein for differentiation of infections of cattle by *Mycobacterium bovis* and by *M. avium* subsp. *avium* and *M. avium* subsp. *paratuberculosis*.** *Clinical and Diagnostic Laboratory Immunology.* 2004; 11 (4): 729-735. ISSN: 1071-412X

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium avium* ssp *paratuberculosis*, diagnosis, comparison, vitro responses, recombinant ESAT-6:CFP-10 (rESAT-6:CFP-10) fusion protein by blood leukocytes, cattle naturally exposed to *Mycobacterium avium* or experimentally challenged with *Mycobacterium avium* ssp. *avium*, *Mycobacterium avium* ssp. *paratuberculosis* compared to responses by *ycobacterium bovis*-infected cattle.

Yang, WeiChong; Jiao, XinAn. **The advances in diagnosis techniques of bovine tuberculosis.** *Chinese Journal of Zoonoses.* 2004; 20 (12): 1090-1093. ISSN: 1002-2694. Note: In Chinese.

**Descriptors:** *Mycobacterium bovis*, cattle disease, bovine tuberculosis, diagnostic techniques, animal experiments, ELISA, blood, lymphocytes, chromatography, cytokines, genetics, hyperplasia, immunity, immunology, interleukin 2; lipids, PCR, RFLP, molecular biology, sampling, screening, serology, tuberculin, Western blotting, antibody competitive tests, dot immunogold filtration assay, fluorescent polarization assay, interferon gamma, sensitivity, sequencing, smear tests.

Yei, Ku Song; Wu, Yeong Huey; Liao, Ming Huei; Liu, Hung Jen; Chang, Ching Dong; Shiau, Chung Jung.

**Difficulties in eradication of tuberculosis infected cows from the infected dairy herds in Taiwan.** *Taiwan Veterinary Journal.* 2004; 30 (1): 56-63. ISSN: 1682-6485. Note: In Chinese.

**Descriptors:** cattle, *Mycobacterium bovis*, diagnostic testing, intradermal tuberculin test (ITT), gamma interferon test (IFN-gamma test), duplex polymerase chain reaction (duplex PCR), blood, nasal mucus samples, milk samples, difficulty eliminating disease, disease reservoirs on the farms, humans, dogs, cats, rats, nasal discharges and raw milk exposed calves, Taiwan.

## 2003

Adams, S.J.R. **Badgers and bovine TB: bio-indicator or source?** *Veterinary Times.* 2003, 33 (9) 8-10. ISSN: 1352-9374

**Descriptors:** badgers, cattle, deer, *Mycobacterium bovis*, disease transmission patterns, disease vectors, sentinel animals, vector potential, tuberculosis, reviews.

Ameni, G.; Amenu, K.; Tibbo, M. **Bovine Tuberculosis: Prevalence and risk factor assessment in cattle, and cattle owners in Wuchali-Jida District, Central Ethiopia.** *Journal of Applied Research in Veterinary Medicine.* 2003, 1 (1) 17-26. ISSN: 1542-2666.

**NAL Call Number:** SF601.J63

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, zoonotic disease potential, cattle, humans, risk factors, disease prevalence, risks of food consumption, poor sanitary measures, lack of understanding about zoonotic potential, Ethiopia.

Ameni, G.; Bonnet, P.; Tibbo, M. **A cross-sectional study of bovine tuberculosis in selected dairy farms in Ethiopia.** *Journal of Applied Research in Veterinary Medicine.* 2003; 1 (4): 253-258. ISSN: 1542-2666

**NAL Call Number:** SF601.J63

**Descriptors:** 1171 dairy cattle, 12 dairy farms, Holstein, Zebu crosses, 46.8% animal prevalence, 91.7 herd prevalence, *Mycobacterium bovis*, comparative intradermal tuberculin test, bacteriological study, milk cultures, 548 animals positive, positive correlation between herd size and prevalence of *M. bovis*, farm and breed differences, management effects, sanitary measures, economic effect of disease, public health risks, husbandry practices, Ethiopia.

Bonesi, G.L.; Scalone, B.C.V.; Okano, W.; Rosa, A. **Lesoes hepáticas em bovinos abatidos em matadouro—frigorífico. [Hepatic lesions in cattle slaughtered in a refrigerator abattoir.]** *Higiene Alimentar.*

2003, 17 (106) 78-83. Note: In Portuguese with an English summary.

**Descriptors:** cattle, various diseases, post-slaughter examinations, lesions, 6.8% showed liver abscesses; slaughter, teleangiectasis, hepatic congestion, perihepatitis, cirrhosis, hepatitis, hydatidosis, fasciolosis, tuberculosis, Parna, Brazil.

Buddle, B.M.; Wedlock, D.N.; Parlane, N.A.; Corner, L.A.L.; De Lisle, G.W.; Skinner, M.A. **Revaccination of neonatal calves with *Mycobacterium bovis* BCG reduces the level of protection against bovine tuberculosis induced by a single vaccination.** *Infection and Immunity*. 2003; 71 (11): 6411-6419. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** Cattle may provide a suitable model for testing ways of improving tuberculosis vaccine efficacy in human infants. A vaccination and challenge study was undertaken in calves to determine the optimal time to vaccinate neonatal animals with *Mycobacterium bovis* bacillus Calmette-Guerin (BCG) for protection against tuberculosis and to determine whether revaccination with BCG was beneficial. Calves (10 per group) were vaccinated with BCG within 8 h of birth or at 6 weeks of age, when immune responses to antigens of environmental mycobacteria were detectable, or vaccinated at birth and revaccinated at 6 weeks. A control group was not vaccinated. BCG vaccination at birth induced strong antigen-specific gamma interferon (IFN-gamma) and interleukin-2 (IL-2) responses and antigen-specific activation in CD4+, CD8+, and WC1+ gamma delta T-cell subsets from blood. The proportions of animals per group with macroscopic tuberculous lesions after challenge were 0/10 for BCG at birth, 1/9 for BCG at 6 weeks, 4/10 for the revaccinated group, and 10/10 for the nonvaccinated group. There was no significant difference in the levels of protection between groups vaccinated at birth or at 6 weeks, while animals vaccinated both at birth and at 6 weeks had significantly less protection than those vaccinated only at birth. The revaccinated calves that subsequently developed tuberculous lesions had significantly stronger IFN-gamma and IL-2 responses to bovine purified protein derivative after the BCG booster than those in the same group that did not develop lesions. The results indicated that BCG vaccination at birth induced a high level of immunity and that the sensitization of very young animals to antigens of environmental mycobacteria by 6 weeks of age did not affect the effectiveness of BCG. However, BCG revaccination of these young animals was contraindicated.

**Descriptors:** vaccination, clinical techniques, Friesian calves, *Mycobacterium bovis*, strain Pasteur 1173P2, strain Wag202, BCG vaccine, immune system, IFN-gamma/delta subsets, CD4+, CD8+, WC1+.

Buddle, B.M.; Pollock, J.M.; Skinner, M.A.; Wedlock, D.N. **Development of vaccines to control bovine tuberculosis in cattle and relationship to vaccine development for other intracellular pathogens.** *International Journal for Parasitology*. 2003; 33 (5-6): 555-566. ISSN: 0020-7519. Note: In the special issue: *Vaccines in the 21st century: Expanding the Boundaries of Human and Veterinary Medicine*. Edited by D. Brake.

**NAL Call Number:** QH547.I55

**Abstract:** Vaccination of cattle against bovine tuberculosis could be an important strategy for the control of disease either where there is a wildlife reservoir of *Mycobacterium bovis* infection or in developing countries where it is not economically feasible to implement a 'test and slaughter' control program. Advances in the understanding of protective immune responses to *M. bovis* infection in cattle and the advent of new molecular biological techniques, coupled with the sequencing of the *M. bovis* genome have provided opportunities for the rational development of improved tuberculosis vaccines. A number of new tuberculosis vaccines including attenuated *M. bovis* strains, killed mycobacteria, protein and DNA vaccines are under development and many are being assessed in cattle. Recent results have revealed several promising vaccine candidates and vaccination strategies. Ways of distinguishing between vaccinated and infected cattle are becoming available and the possibility of new approaches to the eradication of tuberculosis from domestic livestock is discussed. Similarities between the mechanisms of protective immunity against *M. bovis* and against other intracellular parasites continue to be found and discoveries from vaccine studies on bovine tuberculosis may provide helpful insights into requirements for vaccines against other intracellular pathogens.

**Descriptors:** *Mycobacterium bovis*, bovine tuberculosis, vaccine development, vaccines, immunity, vaccination cattle, BCG vaccine, literature reviews.

Cavirani, S.; Fanti, F.; Benecchi, M.; Calderaro, A.; Taddei, S.; Arcangeletti, C.; Medici, M.C.; Dettori, G.; Chezzi, C. **Evaluation of susceptibility of *Mycobacterium bovis* to antituberculous drugs by radiometric BACTEC 460TB system.** *Microbiologica*. 2003; 26 (2): 181-186. ISSN: 1121-7138

**Descriptors:** cattle, *Mycobacterium bovis*, strain susceptibility to antibiotics, post slaughter cattle, tissue sampling of

lesions, 61 strains collected, 41 susceptible to isoniazid and rifampin, 13 resistant to isoniazid only, not strains resistant to rifampin only, 2 strains resistant to both drugs, Italy

Corner, L.A.L.; Stevenson, M.A.; Collins, D.M.; Morris, R.S. **The re-emergence of *Mycobacterium bovis* infection in brushtail possums (*Trichosurus vulpecula*) after localised possum eradication.** *New Zealand Veterinary Journal*. 2003, 51 (2) 73-80.

**NAL Call Number:** 41.8 N483

**Descriptors:** cattle, brushtail possums, *Mycobacterium bovis*, infection patterns, wild animal disease vectors and reservoirs, epidemiology, pest control, spatial distribution patterns, tuberculosis, vector potential, New Zealand.

De Sousa, R.D.; Reis, D.O.; Guimaraes, K.C.S.; Aquino, C.A.M. **Linfonodos com maior frequencia de localizacao para tuberculose bovina, em animais abatidos em um frigorifico sob inspecao federal, no municipio de Uberlandia-MG. [Lymph nodes with the greatest frequency of localization of bovine tuberculosis, in slaughtered animals kept in a refrigerator under federal inspection, in the municipality of Uberlandia-MG.]** *Higiene Alimentar*. 2003, 17 (106) 35-39. ISSN: 0101-9171 Note: In Portuguese with an English summary.

**Descriptors:** cattle, *Mycobacterium bovis*, cattle bacterial diseases, post-slaughter examination, disease incidence, tuberculosis, lesions, lymph nodes, slaughter, Minas Gerais, Brazil.

Diaz-Otero, F.; Banda-Ruiz, V.; Jaramillo-Meza, L.; Arriaga-Diaz, C.; Gonzalez-Salazar, D.; Estrada-Chavez, C. **Identification of *Mycobacterium bovis* infected cattle by immunological and molecular methods.** *Veterinaria Mexico*. 2003, 34 (1) 13-26. ISSN: 0301-5092 Note: In English and Spanish.

**NAL Call Number:** SF604.V48

**Descriptors:** dairy cattle, *Mycobacterium bovis*, antibodies, ELISA, immunodiagnosis, immunological techniques, interferon, spoligotyping, serological surveys, control, anergic animals, Mexico.

Fletcher, J. **Tuberculosis again?** *Deer Farming*. 2003, No.72, 20-24.

**Descriptors:** deer, bovine tuberculosis, *Mycobacterium*, delayed type hypersensitivity, epidemiology, skin tests, zoonoses.

Gallaher, E.; Kelly, L.; Pfeiffer, D.U.; Wooldridge, M. **A quantitative risk assessment for badger to cattle transmission of *Mycobacterium bovis*.** *Proceedings of a meeting Society for Veterinary-Epidemiology and Preventive Medicine*. [Great Britain]. 2003: 33-44. ISSN: 0956-7496. Note: Meeting held March 31-April 2, 2003, Warwick, England.

**NAL Call Number:** SF780.9.S63

**Descriptors:** cattle, badgers, *Mycobacterium bovis*, bovine tuberculosis, disease transmission, risk assessment, mathematical models.

Garnett, B.T.; Roper, T.J.; Delahay, R.J. **Use of cattle troughs by badgers (*Meles meles*). A potential route for the transmission of bovine tuberculosis (*Mycobacterium bovis*) to cattle.** *Applied Animal Behavior Science*. 2003. 80 (1): 1-8. ISSN: 0168-1591

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503301/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503301/description#description)

**NAL Call Number:** QL750.A6

**Descriptors:** badgers *Meles meles*, wild animals, cattle diseases, *Mycobacterium bovis*, cattle feed troughs height, wild animals, cattle-diseases, bovine tuberculosis, disease transmission, feces, vertebrate pests, wildlife/livestock interactions, wildlife food habits, United Kingdom.

Goodchild, A.V.; De La Rua Domenech, R.; Palmer, S.; Dale, J.; Gordon, S.V.; Hewinson, R.G.; Clifton-Hadley, R.S. **Association between molecular type and the epidemiological features of *Mycobacterium bovis* in cattle.** *Proceedings of a meeting Society for Veterinary Epidemiology and Preventive Medicine*. [Great Britain] 2003: 45-59. ISSN: 0956-7496. Note: Meeting was held March 31-April 2, 2003, Warwick, England.

**NAL Call Number:** SF780.9.S63

**Descriptors:** cattle, *Mycobacterium bovis*, epidemiology, polymerase chain reaction, PCR, spoligotyping, variable number tandem repeats, spatial analysis.

Gormley, E.; Costello, E. **Tuberculosis and badgers: new approaches to diagnosis and control.** *Society for Applied*

*Microbiology Symposium Series*. 2003, No.32, 80S-86S.

**NAL Call Number:** QR1.S64 no. 32

**Descriptors:** Eurasian badger, *Meles meles*, wild animal disease reservoir, cattle, *Mycobacterium bovis* infection, disease control eradication programs, diagnosis of disease in badgers, profiles of disease episodes, possible vaccination, Ireland, Great Britain.

Howard, C.J.; Charleston, B.; Stephens, S.A.; Sopp, P.; Hope, J.C. **The role of dendritic cells in shaping the immune response.** *Animal Health Research Reviews*. 2004; 5 (2): 191-195. Note: Proceedings of the 3rd International Veterinary Vaccines and Diagnostics Conference, University of Guelph, Canada, 13-18 July 2003.

**Descriptors:** cattle, livestock, dendritic cells, immune responses, stimulating naïve T cells, adaptive immunity, in vivo, ex-vivo, subpopulations of myeloid dendritic cells, cytokines, vaccination, *Mycobacterium bovis*.

Jian, MinHua; Xu, ZhaoHua; Shao, WeiJie (et-al). **Enzyme-linked immunosorbent assay for detection of bovine IgG antibody to *Mycobacterium tuberculosis*.** *Chinese Journal of Zoonoses*. 2003, 19 (2) 81-82. Note: In Chinese with an English summary.

**Descriptors:** cattle, *Mycobacterium tuberculosis*, antibodies, detection assay method, blood serum, ELISA, IgG, lipopolysaccharides, monoclonal antibodies, auxiliary test for intradermal test.

Koets, Ad.P. **Mycobacterial heat shock proteins and the bovine immune system.** In W. van Eden, Birkhaeuser Verlag, Basel. *Heat shock proteins and inflammation*. 2003: 233-244. ISBN: 3764369329.

**Descriptors:** bovines, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium bovis*, heat shock proteins, immunodominant antigens, bacterial disease, gamma delta T-cell, blood and lymphatics, immune system, physiology.

Komaromy, A.M.; Andrew, S.E.; Brooks, D.E.; Detrisac, C.J.; Gelatt, K.N. **Periocular sarcoid in a horse.** *Veterinary Ophthalmology*. 2004; 7 (3): 141-146. ISSN: 1463-5216

**NAL Call Number:** SF891.V47

**Descriptors:** Thoroughbred mare, horse, case report, eyelid sarcoid, neoplasms, *Mycobacterium bovis* BCG.

Malone, F.E.; Wilson, E.C.; Pollock, J.M.; Skuce, R.A. **Investigations into an outbreak of tuberculosis in a flock of sheep in contact with tuberculous cattle.** *Journal of Veterinary Medicine Series B*. 2003; 50 (10): 500-504. ISSN: 0931-1793

**Descriptors:** sheep, cattle, *Mycobacterium bovis*, first evidence of transmission from cattle to sheep, animals with positive comparative intradermal tuberculin test, postmortem examination, tuberculous lesions, strain typing spoligotyping and variable tandem repeats typing, in vitro release of interferon-gamma, histopathology, Britain, Ireland, UK.

Martinez-Vivot, M.; Zumarraga, M.; Romano, M.; Cataldi, A.; Diz, L.; Guida, N.; Barboni, A.; Moras, E.V.

**Aplicacion del spoligotyping para identificar el origen de reinfeccion de tuberculosis bovina en un tambo de la provincia de Buenos Aires. [Usefulness of spoligotyping to identify the origin of reinfection of bovine tuberculosis in a dairy farm in the province of Buenos Aires.]** *Veterinaria Argentina*. 2003, 20 (191) 27-31. Note: In Spanish with an English summary.

**NAL Call Number:** SF604.V463

**Descriptors:** dairy cattle, PPD intradermal test, *Mycobacterium bovis*, infection source, spoligotyping test, disease survey, re-infection, tuberculous lesions, Argentina.

Maue, Alex C.; Waters, W. Ray; Palmer, Mitch; Estes, D.Mark. **Costimulatory molecules augment DNA vaccine-induced immunity to experimental bovine tuberculosis.** *FASEB Journal*. 2003; 17 (7): C26. ISSN: 0892-6638. Note: Meeting abstract. 90th Anniversary Annual Meeting of the American Association of Immunologists, Denver, CO, USA; May 06-10, 2003.

**Descriptors:** bovine tuberculosis, DNA vaccines, immunostimulant drug, mouse model, *Mycobacterium bovis*, co-stimulatory molecules, laboratory techniques, immune responses.

Milian-Suazo, F.; Anaya-Escalera, A.M.; Gallegos-Torres, R.M. **A review of *M. bovis* BCG protection against TB in cattle and other animals species.** *Preventive Veterinary Medicine*. 2003, 58 (1-2) 1-13.

**NAL Call Number:** SF601.P7

**Descriptors:** cattle, *Mycobacterium bovis* BCG strain, disease control, immunity, potency, reviews, tuberculosis vaccination, vaccine development.

Mota, P.M.P.C.; Motta, P.M.C.; Lobato, F.C.F.; Lage, A.P.; Ribeiro, A.C.C.L.; Leite, R.C. **Avaliação do tratamento com isoniazida em bovinos infectados naturalmente pelo *Mycobacterium bovis*.** [Evaluation of the treatment with isoniazid carried out in bovines naturally infected with *Mycobacterium bovis*.] *Arquivo Brasileiro de Medicina Veterinária e Zootecnia*. 2004; 56 (5): 581-588. ISSN: 0102-0935. Note: In Portuguese.

**Descriptors:** cattle, 240 animals, naturally infected herd, intermittent treatment with isoniazid, oral dosing of 3x/week, for 10 months, efficacy of the drug, treatment did not cause selection of drug resistant strains.

New Zealand, Livestock Improvement Corporation Limited. *Dairy Statistics Livestock Improvement Corporation Limited, 2001-2002*. 2003, 45 pp. Note: Published by the Livestock Improvement Corporation Ltd, New Zealand Dairy Board; Hamilton; New Zealand

**Descriptors:** national dairy cattle, statistics, disease control, animal breeding, bovine leucosis and tuberculosis, *Mycobacterium*, calving, dairy industry, disease control, herd improvement, milk production, statistics, trends, New Zealand.

Nonnecke, B. J.; Waters, W.R.; Foote, M.R.; Fowler, R.M.; Horst, R.L.; Miller, B.L. **Interferon-C and TNF-C secretion by mononuclear leukocytes from peripheral blood of young and adult cattle, vaccinated with *Mycobacterium bovis* BCG: Modulation by 1,25-dihydroxyvitamin D<sub>3</sub>.** *International Journal of Vitamin and Nutrition Research*. 2003 73: 235-244.

**Descriptors:** cattle, age group comparison, immunological response, white blood cells, peripheral blood sampling, vaccination, *Mycobacterium bovis* BCG, effects of 1,25-dihydroxyvitamin D<sub>3</sub>.

Popluhar, L.; Hyzova, A. **Tuberkuloza zvierat ako zoonoza aj ako antropozoonoza.** [Tuberculosis of animals as zoonosis as well as anthroozoonosis.] *Slovenský Veterinársky Casopis*. 2003; 28 (6): 38-39. ISSN: 1335-0099. Note: In Slovakian with an English summary.

**Descriptors:** elimination of animal tuberculosis, *Mycobacterium bovis*; *Mycobacterium bovis* BCG strain, BCG vaccine, vaccination, diagnosis, disease prevention and control, disease prevalence, zoonoses, Czechoslovakia

Rajeev Singh; Hari Shankar. **Occurrence of tuberculosis at an organized cattle farm.** *Indian Veterinary Journal*. 2003; 80 (11): 1100-1102. ISSN: 0019-6479

**NAL Call Number:** 41.8 IN2

**Descriptors:** 4696 cattle, *Mycobacterium bovis*, tuberculin testing for 3 years, 107 developed the disease, mortality rate recorded, age differences, disease prevalence, epidemiology, Uttar Pradesh, India.

Ramirez, I.C.; Santillan, M.A.; Dante, V. **The goat as an experimental ruminant model for tuberculosis infection.** *Small Ruminant Research*. 2003, 47 (2) 113-116. ISSN: 0921-4488

**NAL Call Number:** SF380.I52

**Abstract:** Young goats were inoculated intratracheally with a low dose of *Mycobacterium bovis* to determine if they develop lesions similar to those seen in the natural disease in cattle. After 3 months, the challenge induced small lesions (< 1 cm diameter) localized in the lungs and pulmonary lymph nodes, similar to those seen in the natural cattle disease. All of the *M. bovis*-inoculated young goats showed strong cellular immune responses to bovine PPD. Results of the present study suggest that young goats can be used as animal models since a low dose challenge mimics the natural pathogenesis and pathology processes caused by *M. bovis* in cattle.

**Descriptors:** goats, animal model for disease, experimental infection, immune response, kids, lesions, *Mycobacterium bovis*, tuberculosis.

Reid, S.W.J. (ed); Menzies, F.D. *Society for Veterinary Epidemiology and Preventive Medicine. Proceedings of a meeting held at University of Warwick, England, 31st-March 2<sup>nd</sup> April 2003*. 2003, 277 pp. Note: The proceedings has 21 articles on a variety of topics related to animal diseases.

**Descriptors:** cattle, dogs, horses, *Mycobacterium bovis*, epidemiology of bovine tuberculosis, injuries, FMD, heart diseases, mastitis, satellite imagery, vaccination.

Roper, T.J.; Garnett, B.T.; Delahay, R.J. **Visits to farm buildings and cattle troughs by badgers (*Meles meles*): a potential route for transmission of bovine tuberculosis (*Mycobacterium bovis*) between badgers and cattle.** *Cattle Practice*. 2003, 11 (1) 9-12. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, farms, tracking wild badgers, *Meles meles*, nighttime visits to farms, climate, *Mycobacterium bovis*, cats, foxes, disease transmission, feces, feed trough contamination, rain, urine, disease control.

Shirima, G.M.; Kazwala, R.R.; Kambarage, D.M. **Prevalence of bovine tuberculosis in cattle in different farming systems in the eastern zone of Tanzania.** *Preventive Veterinary Medicine*. 2003, 57 (3) 167-172. ISSN: 0167-5877

**NAL Call Number:** SF601.P7

**Descriptors:** *Mycobacterium bovis*, Zebu cattle, free-ranging system, intensive management, intradermal tuberculin testing, incidence levels in two systems, disease survey, epidemiology, Tanzania.

Sreedevi, B.; Krishnappa, G. **Pathogenesis of *Mycobacterium tuberculosis* isolated from cattle.** *Indian Journal of Comparative Microbiology, Immunology and Infectious Diseases*. 2003; 24 (1): 59-62. ISSN: 0970-9320

**Descriptors:** cattle, *Mycobacterium*, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium tuberculosis* in cattle, different mycobacterial cultures, bovine macrophage cell cultures, NBT dye reduction test, disease transmission, levels of pathogenicity, phagocytosis, cattle as host organisms.

Sreedevi, B.; Krishnappa, G. **Detection of *Mycobacterium tuberculosis* complex organisms in clinical samples of cattle by PCR and DNA probe methods.** *Indian Journal of Comparative Microbiology, Immunology and Infectious Diseases*. 2003; 24 (2): 167-171. ISSN: 0970-9320

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium phlei*, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, BCG, *Mycobacterium avium*, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium tuberculosis* complex, diagnosis, diagnostic techniques, DNA probes, polymerase chain reaction, PCR, primers for IS6110, dot blot hybridization, tuberculin, tuberculosis, blood samples, milk samples, semen samples, Karnataka, India.

Usabiaga, J. **Intersectoral Coordination-between-Health and Agriculture:-Zoonoses, Food Safety and Food and Mouth Disease Final Report and Proceedings, XII-Inter American Meeting, Sao Paulo, Brazil, 2-4 May 2001.**

2003: 119-132. ISBN: 9275124507. Note: Published by the Pan American Health Organization, Pan American Sanitary Bureau, Washington, DC, US.

**Descriptors:** cattle, goats, humans, *Mycobacterium bovis*, *Brucella*, tuberculosis, animal health, brucellosis, disease prevention and control programs, disease prevalence, disease surveys, disease transmission, zoonotic diseases, epidemiology, public health, food contamination, food safety, international trade, participation, public health, quality controls, Latin America.

Vordermeier, H.M.; Lowrie, D.B.; Hewinson, R.G. **Improved immunogenicity of DNA vaccination with mycobacterial HSP65 against bovine tuberculosis by protein boosting.** *Veterinary Microbiology*. 2003, 93 (4) 349-359. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Descriptors:** cattle, adjuvants, bacterial antigens, cell mediated immunity, disease control and prevention, *Mycobacterium tuberculosis*, DNA, humoral immunity, IgG, immune response, immunization, immunogenetics, interferon, lymphocyte transformation, recombinant proteins, tuberculin, tuberculosis, vaccination, vaccines.

Waters, W.R.; Nonnecke, B.J.; Foote, M.R.; Maue, A.C.; Rahner, T.E.; Palmre, M.V. Whipple, D.L.; Horst, R.L.; Estes, D.M. ***Mycobacterium bovis* bacilli Calmette Guérin vaccination of cattle, activation of bovine CD4<sup>+</sup> and CC-TCR<sup>+</sup> cells and modulation by 1,25-dihydroxyvitamin D<sub>3</sub>** *Tuberculosis*, 2003, 83: 287-297.

**Descriptors:** cattle, *Mycobacterium bovis* BCG, vaccination, immune response, CD4<sup>+</sup> and CC-TCR<sup>+</sup> cells, effects of dihydroxyvitamin D<sub>3</sub>.

Waters, W.R.; Palmer, M.V.; Whipple, D.L.; Carlson, M.C.; Nonnecke, B.J. **Diagnostic implication of antigen-induced IFN- $\gamma$ , nitric oxide, and TNF- $\alpha$  production by blood mononuclear cells from *Mycobacterium bovis*-infected cattle.** *Clinical and Diagnostic Laboratory Immunology*. 2003, 10: 960-966.

**Descriptors:** cattle, *Mycobacterium bovis*, disease effects, immunological response, mononuclear blood cells, white cells, antigen induced responses, possible diagnostic value.

Wedlock, D.N.; Skinner, M.A.; Parlane, N.A.; Vordermeier, H.M.; Hewinson, R.G.; De Lisle, G.W.; Buddle, B.M.

**Vaccination with DNA vaccines encoding MPB70 or MPB83 or a MPB70 DNA prime-protein boost does not protect cattle against bovine tuberculosis.** *Tuberculosis* (Amsterdam). 2003; 83 (6): 339-349. ISSN: 1472-9792

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/638428/description?navopenmenu=-2](http://www.elsevier.com/wps/find/journaldescription.cws_home/638428/description?navopenmenu=-2)

**Descriptors:** cattle, *Mycobacterium bovis*, bovine tuberculosis, DNA vaccines, control strategy, antigens, vaccinated with MPB83 DNA, MPB70 DNA, or DNA followed by MPB70 protein or injected with BCG or control plasmid DNA, did not induce immunity in calves.

Whelan, A.O.; Hope, J.C.; Howard, C.J.; Clifford, D.; Hewinson, R.G.; Vordermeier, H.M. **Modulation of the bovine delayed-type hypersensitivity responses to defined mycobacterial antigens by a synthetic bacterial lipopeptide.**

*Infection and Immunity*. 2003; 71 (11): 6420-6425. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The use of defined protein and peptide antigens can overcome specificity limitations of purified protein derivatives in the detection of bovine tuberculosis when the antigens are used in blood-based tests. Since the use of these specific antigens as skin test reagents could have practical advantages, we investigated the potential of *Mycobacterium bovis*-specific antigens to stimulate delayed-type hypersensitivity (DTH) responses in cattle experimentally infected with *M. bovis*. A cocktail of the recombinant antigens ESAT-6, MPB83, and MPB64 failed to stimulate in vivo DTH in cattle that had been experimentally infected with *M. bovis* despite the fact that the antigens were recognized in vitro by the same animals. However, it was possible to stimulate antigen-specific bovine DTH responses by using ESAT-6 in combination with a synthetic bacterial lipopeptide. This lipopeptide stimulated the release of the proinflammatory cytokine tumor necrosis factor alpha from monocyte-derived bovine dendritic cells in vitro, thereby providing a possible mechanism for its DTH-enhancing properties.

**Descriptors:** *Mycobacterium bovis*, detection methods, defined protein and peptide antigens, skin reagents, stimulation of delayed-type hypersensitivity, cattle synthetic bacterial lipopeptide.

Wilson, R.T. **Animal health and disease control in the Usangu Wetland of Southwestern Tanzania.** *Tropical Animal Health and Production*. 2003, 35 (1) 47-67. ISSN: 0049-4747 Note: In English with French and English summaries.

**NAL Call Number:** SF601.T7

**Descriptors:** livestock, African swine fever, animal diseases, animal health, anthrax, cysticercosis, disease control, environmental factors, epidemiology, foot and mouth disease, pleuropneumonia, rabies, Rift Valley fever, rinderpest, trypanosomiasis, tuberculosis, veterinary services, African swine fever virus, Glossina, lumpy skin disease virus, Theileria parva, Tanzania.

Zhang, XiYue; Wang, JunWei; Gao, YunHang; He, ZhaoYang. **Comparison of three methods on detecting bovine tuberculosis in cattle ranch.** *Chinese Journal of Veterinary Science*. 2003; 23 (6): 555-556. ISSN: 1005-4545.

Note: In Chinese with an English summary.

**Descriptors:** 498 cattle, infected with *Mycobacterium bovis*, diagnostic techniques, diagnosis, bovine tuberculosis allergic reaction, Dot-IGSS, ELISA, recommend both tests, China.

## 2002

Abou Eisha, A.M.; El Attar, A.A.; El Sheary, M.N. **Bovine and atypical mycobacterial infections of cattle and buffaloes in Port Said Province, Egypt.** *Assiut Veterinary Medical Journal*. 2002. 47 (93) 152-162.

**NAL Call Number:** SF604 A77

**Descriptors:** *Bubalus*, disease incidence, epidemiology, lymph nodes, tuberculin, tuberculosis, buffalo, cattle, *Mycobacterium avium* complex, *Mycobacterium bovis*, *Mycobacterium fortuitum*, *Mycobacterium kansasii*, *Mycobacterium smegmatis*, Egypt.

Adhikary, M.K.; Mondal, M.; Basak, D.K. **Pulmonary tuberculosis in cattle -- a study on its incidence and**

**pathology.** *Journal of Interacademia*. 2002, 6 (Special issue) 694-699.

**Descriptors:** adult cattle, post-slaughter tissue sampling, lungs, lesions described, disease incidence levels, histopathological examinations, tubercles, epidemiology, India

Amadori, M.; Lyashchenko, K.P.; Gennaro, M.L.; Pollock, J.M.; Zerbini, I. **Use of recombinant proteins in antibody tests for bovine tuberculosis.** *Veterinary Microbiology*. Apr 2, 2002. 85 (4) 379-389. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Abstract:** Tuberculosis (TB) in cattle remains a major zoonotic and economic problem in many countries. Since the standard diagnostic assay, the intradermal test (IDT) with bovine PPD tuberculin, has less than optimal accuracy in all situations, other diagnostic methods such as serological assays have been investigated. Because of fundamental concerns for the low sensitivity and specificity of previous ELISA protocols, a profiling ELISA with nine purified, recombinant proteins of TB complex mycobacteria, was employed on samples from four groups of cattle: (a) naturally *Mycobacterium avium*-exposed and experimentally *Mycobacterium bovis*-infected, (b) officially-certified TB-free herds, (c) exposed to *M. bovis* in two field TB outbreaks and scored as bovine reactors in the gamma-IFN assay for bovine TB, (d) paratuberculosis (para TB)-infected. The described ELISA proved to be highly specific. In fact, the antibody (Ab) response could be consistently detected in 3 out of 3 endotracheally-infected calves and in 1 out of 3 contact-infected calves. There was also a very low prevalence of low-titered, non-specific Ab responses in paraTB-infected animals. As for the animals exposed to field TB outbreaks, 16 out of 28 gamma-IFN positive cattle were also Ab-positive; importantly, 7 out of 12 gamma-IFN positive, IDT negative cattle showed Ab responses to TB proteins. In general, the profile of the Ab response varied among animals; the reaction to single recombinant antigens was sometimes transient and fluctuating, whereas the panel of antigens on the whole was indeed more effective in Ab detection.

**Descriptors:** cattle tuberculosis antibodies, diagnostic techniques, recombinant proteins, tuberculin, serology, ELISA, *Mycobacterium avium*, *Mycobacterium bovis*, outbreaks, interferon, *Mycobacterium paratuberculosis*, detection.

Amadori, M.; Tagliabue, S.; Lauzi, S.; Finazzi, G.; Lombardi, G.; Telo, P.; Pacciarini, L.; Bonizzi, L. **Diagnosis of *Mycobacterium bovis* infection in calves sensitized by mycobacteria of the avium/intracellulare group.** *Journal of Veterinary Medicine. Series B*. 2002. 49 (2) 89-96.

**NAL Call Number:** 41.8 Z52

**Descriptors:** diagnosis, experimental infections, interferon, tuberculin, cattle, calves, *Mycobacterium avium* complex, *Mycobacterium bovis*, diagnostic procedures.

Anonymous. **A crisis in the making.** *Veterinary Record*. July 13, 2002. 151 (2) 33. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, tuberculosis, disease control, testing, UK.

Anonymous. **Keeping the lid on bovine TB.** *Veterinary Record*. Mar 2, 2002. 150 (9) 257. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle tuberculosis, *Mycobacterium bovis*, diagnosis, disease control.

Bengis, R.G.; Kock, R.A.; Fischer, J. **Infectious animal diseases: the wildlife/livestock interface.** *Revue Scientifique et Technique Office International des Epizooties*. 2002. 21 (1) 53-65. Note: In English with Spanish and French summaries.

**NAL Call Number:** SF781 R4

**Descriptors:** analytical methods, animal diseases, brucellosis, *Brucella*, diagnosis, diagnostic techniques, disease control, ecotourism, livestock, rinderpest, tuberculosis, wildlife conservation.

Buddle, B.M.; Wards, B.J.; Aldwell, F.E.; Collins, D.M.; de Lisle, G.W. **Influence of sensitization to environmental mycobacteria on subsequent vaccination against bovine tuberculosis.** *Vaccine*. 2002. 20 (7-8) 1126-1133.

**NAL Call Number:** QR189 V32

**Descriptors:** BCG vaccine, calves, cattle, humans, immune response, immunization, interferon, interleukin-2, live vaccines, potency, efficacy, tuberculosis, vaccination, virulence, *Mycobacterium bovis*, *Mycobacterium avium*, purified protein derivative, sensitization.

Buddle, B.M.; Skinner, M.A.; Wedlock, D.N.; Collins, D.M.; de Lisle, G.W.; Fossum, C. (ed.); Wattrang, E. **New generation vaccines and delivery systems for control of bovine tuberculosis in cattle and wildlife.** *Veterinary*

*Immunology and Immunopathology*. 2002. 87 (3-4) 177-185. ISSN: 0165-2427. Note: 6th International Veterinary Immunology Symposium, Ultuna Campus, Swedish University of Agricultural Sciences, Uppsala, Sweden, July 2001.

**NAL Call Number:** SF757.2.V38

**Descriptors:** vaccines, *Mycobacterium bovis*, cattle, wildlife.

Cataldi, A.A.; Gioffre, A.; Santangelo, M.P.; Alito, A.; Caimi, K.; Bigi, F.; Romano, M.I.; Zumarraga, M. **El genotipo de *Mycobacterium bovis* mayoritario en la Argentina lo es tambien en las Islas Britanicas: la tuberculosis bovina provino de Gran Bretana?** [The prevailing genotype of *Mycobacterium bovis* in Argentina is also that of the British Isles: Did bovine tuberculosis originate in United Kingdom?] *Revista Argentina de Microbiologia*. 2002. 34 (1) 1-6. Note: In Spanish with an English summary.

**Descriptors:** cattle, *Mycobacterium bovis*, epidemiology, genotypes, imported infections, Argentina, Great Britain, USA.

Choi, K.P.; Kendrick, N.; Daniels, L. **Demonstration that *fbiC* is required by *Mycobacterium bovis* BCG for coenzyme F420 and FO biosynthesis.** *Journal of Bacteriology*. 2002, 184 (9) 2420-2428. ISSN: 0021-9193  
**NAL Call Number:** 448.3 J82

**Descriptors:** amino acid sequences, coenzyme F420 and FO biosynthesis, coenzymes, genes, histidine, mutants, proteins, *Mycobacterium bovis* BCG, antituberculosis drug PA-824.

Cobner, A.J. **Electronic submission of tuberculosis test data.** *Cattle Practice*. 2002. 10 (4) 231-233.

**NAL Call Number:** SF961 C37

**Descriptors:** accuracy, data analysis, data collection and processing, recording, tests, tuberculosis, cattle, *Mycobacterium bovis*.

Cockle, P.J.; Gordon, S.V.; Lalvani, A.; Buddle, B.M.; Hewinson, R.G.; Vordermeier, H.M. **Identification of novel *Mycobacterium tuberculosis* antigens with potential as diagnostic reagents or subunit vaccine candidates by comparative genomics.** *Infection and Immunity*. 2002, 70 (12) 6996-7003. ISSN: 0019-9567  
**NAL Call Number:** QR1.I57

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, bacterial antigens, diagnostic antigens, genes, immunization, molecular genetics, tuberculin, vaccination, vaccine development, vaccines.

Collins, J.D. **The control of tuberculosis in cattle: an Irish view.** *Cattle Practice*. 2002. 10 (4) 223-229.

**NAL Call Number:** SF961 C37

**Descriptors:** assays, detection, diagnosis, disease control, geographical information systems, risk, tests, tuberculin, tuberculosis, cattle, *Mycobacterium bovis*, Irish Republic.

Constant, P.; Perez, E.; Malaga, W.; Laneelle, M.A.; Saurel, O.; Daffe, M.; Guilhot, C. **Role of the *pks15/1* gene in the biosynthesis of phenolglycolipids in the *Mycobacterium tuberculosis* complex: evidence that all strains synthesize glycosylated p-hydroxybenzoic methyl esters and that strains devoid of phenolglycolipids harbor a frameshift mutation in the *pks15/1* gene.** *Journal of Biological Chemistry*. 2002. 277 (41) 38148-38158.

**NAL Call Number:** 381 J824

**Descriptors:** biosynthesis, genes, glycolipids, phenolic acids, tuberculosis, virulence, phthiocerol, *Mycobacterium tuberculosis*, phenolphthiocerol.

Cooksey, R.C.; Morlock, G.P.; Holloway, B.P.; Limor, J.; Hepburn, M. **Temperature-mediated heteroduplex analysis performed by using denaturing high-performance liquid chromatography to identify sequence polymorphisms in *Mycobacterium tuberculosis* complex organisms.** *Journal of Clinical Microbiology*. 2002. 40 (5) 1610-1616.

**NAL Call Number:** QR46.J6

**Descriptors:** antituberculous agents, drug resistance, ethambutol, genes, genetic polymorphism, HPLC, isoniazid, methodology, mutations, nucleotide sequences, pyrazinamide, rifampicin, streptomycin, *Mycobacterium tuberculosis*.

Costantini, F. **Aspetti igienico-sanitari degli allevamenti di ungulati selvatici: malattie infettive e monitoraggio sanitario.** [Hygiene and health aspects affecting the breeding of wild ungulates. Infectious diseases and the monitoring of health.] *Notiziario ERSA*. 2002, 15 (4) 21-25. Note: In Italian.

**Descriptors:** captive wild ungulates, health monitoring, African swine fever virus, Aphthovirus, Bluetongue virus, anthrax, brucellosis, enteritis, legislation, pleuropneumonia, *Mycobacterium*, tuberculosis, wild animals, Italy.

Cvetnic, Z.; Zeman, M.; Spicic, S.; Majnaric, D.; Bukovic-Sosic, B.; Mitak, M. **Epizootija tuberkuloze goveda u seoskom gospodarstvu. [Epidemiology of tuberculosis in cattle in a rural husbandry.]** *Veterinarska Stanica*. 2002. 33 (1) 23-30. Note: In Croatian with an English summary.

**Descriptors:** cattle, clinical aspects, cows, disease prevalence, epidemiology, tuberculin, tuberculosis, *Mycobacterium bovis*, pigs, post-slaughter, Croatia.

Dandapat, P.; Rishendra, Verma; Venkatesan, K.; Sharma, V.D.; Katoch, V.M.; Verma, R. **Identification of the bound and unbound lipids on the cell envelopes of *Mycobacterium bovis*.** *Indian Journal of Animal Sciences*. 2002, 72 (11) 946-950. ISSN: 0367-8318

**NAL Call Number:** 41.8 IN22

**Descriptors:** 16 isolates, bovine tissue derivation, *Mycobacterium tuberculosis*, *Mycobacterium bovis* BCG, *Mycobacterium avium*, C-mycosides, phosphatidyl inositol mannosides, polar glycolipids, bacterial antigens, envelope glycoproteins.

Dargatz, D.A.; Garry, F.B.; Traub-Dargatz, J.L. **An introduction to biosecurity of cattle operations.** *Veterinary Clinics of North America, Food Animal Practice*. 2002. 18 (1) 1-5.

**NAL Call Number:** SF601 V535

**Descriptors:** etiology, animal health, brucellosis, cattle diseases, cattle farming, disease prevention, foot and mouth disease, FMD, *Mycobacterium tuberculosis*, biosecurity.

Delafosse, A.; Goutard, F.; Thebaud, E. **Epidemiologie de la tuberculose et de la brucellose des bovins en zone periurbaine d'Abeche, Tchad. [Epidemiology of bovine tuberculosis and brucellosis on the periphery of Abeche, Chad.]** *Revue d'Elevage et de Medecine Veterinaire des Pays Tropicaux*. 2002, 55 (1) 5-13. Note: In French with English and Spanish summaries.

**NAL Call Number:** 41.8 R3262

**Descriptors:** dairy cattle, bovine brucellosis and tuberculosis, age groupings, brucellosis, disease prevalence and control, disease transmission, epidemiology, herd risk factors, *Mycobacterium avium*, *Mycobacterium bovis*, Chad.

Doherty, M.L.; Cassidy, J.P. **New perspectives on bovine tuberculosis.** *Veterinary Journal*. Mar 2002. 163 (2) 109-110. ISSN: 1090-0233

**NAL Call Number:** SF601.V484

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculosis, disease control.

Freitas, J. de A.; Panetta, J.C. **Some epidemiological aspects of tuberculosis in water buffaloes in the Amazon basin of Brazil.** *Buffalo Bulletin*. 2002; 21 (4): 75-82. ISSN: 0125-6726

**Descriptors:** water buffalo, slaughter animal survey for diseases, *Mycobacterium bovis*, gender differences, climate effects, nutritional value, age, disease transmission, Marajo Island farms, Para, Brazil.

Frolich, K.; Thiede, S.; Kozikowski, T.; Jakob, W. **A review of mutual transmission of important infectious diseases between livestock and wildlife in Europe.** In: E.P.J. Gibbs and B.H. Bokma, B.H. (editors). *The Domestic Animal/Wildlife Interface: Issues for Disease Control, Conservation, Sustainable Food Production, and Emerging Diseases Conference and Workshop Organised by the Society for Tropical Veterinary Medicine and the Wildlife Diseases Association Wildlife and Livestock, Disease and Sustainability: What Makes Sense? Pilanesberg National Park, South Africa, 22-27 July, -2001. Annals of New York Academy of Sciences Vol. 969* 2002; 4-13. ISBN: 1573314382

**Descriptors:** wild red foxes, oral vaccination against rabies, zoonotic disease such as hog cholera in wild boar and domestic pigs, cattle and roe deer get BVD, myxomatosis and rabbit hemorrhagic disease in rabbits, *Mycobacterium bovis* in cattle, wild boars, badgers, deer, viral diseases, bacterial disease, serological surveys, various European countries.

Garcia de Viedma, D.; del S. Diaz Infantes, M.; Lasala, F.; Chaves, F.; Alcala, L.; Bouza, E.; del S. Diaz Infantes, M. **New real-time PCR able to detect in a single tube multiple rifampin resistance mutations and high-level isoniazid resistance mutations in *Mycobacterium tuberculosis*.** *Journal of Clinical Microbiology*. 2002. 40 (3) 988-995.

**NAL Call Number:** QR46.J6

**Descriptors:** antituberculous agents, drug resistance, isoniazid, mutations, polymerase chain reaction, rifampicin,

strains, *Mycobacterium tuberculosis*.

Garnett, B.T.; Delahay, R.J.; Roper, T.J. **Use of cattle farm resources by badgers (*Meles meles*) and risk of bovine tuberculosis (*Mycobacterium bovis*) transmission to cattle.** *Proceedings of the Royal Society of London. Series B, Biological Sciences*. July 22, 2002. 269 (1499) 1487-1491. ISSN: 0962-8452

**NAL Call Number:** 501 L84B

**Descriptors:** cattle, badgers, *Meles meles*, disease transmission, cattle housing, feeds, contamination, *Mycobacterium bovis*.

Hancox, M. **The great badgers and bovine TB debate.** *Journal of Agricultural Science*. 2002, 139 (2) 223-226. ISSN: 0021-8596

**NAL Call Number:** 10 J822

**Descriptors:** badgers, cattle, wildlife disease reservoir, disease control program, public health risks, risk assessment, tuberculosis, *Mycobacterium tuberculosis*, zoonoses.

Hasegawa, N.; Miura, T.; Ishii, K.; Yamaguchi, K.; Lindner, T.H.; Merritt, S.; Matthews, J.D.; Siddiqi, S.H. **New simple and rapid test for culture confirmation of *Mycobacterium tuberculosis* complex: a multicenter study.** *Journal of Clinical Microbiology*. 2002, 40 (3) 908-912.

**NAL Call Number:** QR46.J6

**Descriptors:** antigens, bacterial growth, rapid diagnostic methods, *Mycobacterium bovis*, *Mycobacterium tuberculosis* complex, *Mycobacterium africanum*, MPB64 antigen, sensitivity, specificity.

Hauser, R.; Hadorn, D.; Rufenacht, J.; Stark, K. **Examens par sondages permettant d'etablir que la Suisse est indemne de certaines epizooties. Nouvelle methode. [Documentation on the free-of-disease situation with active surveillance in Switzerland. New approach.]** *Epidemiologie et Sante Animale*. 2002, No.42, 81-87. ISSN: 0754-2186 Note: In French with an English summary.

**Descriptors:** disease eradication, brucellosis, tuberculosis, IBR, EBL, active surveillance, data gathering, sampling, simulation model, animal health, Aujeszky's disease, risk-based approach, *Mycobacterium tuberculosis*, pigs, Switzerland.

Jackson, R. **Veterinary epidemiology in New Zealand: a 50-year perspective.** *New Zealand Veterinary Journal*. 2002. 50 (3, Supplement) 13-16.

**NAL Call Number:** 41.8 N483

**Descriptors:** animal diseases, computer software, epidemiology, pets, tuberculosis, cattle, pigs New Zealand.

Kaneene, J.B.; Bruning-Fann, C.S.; Granger, L.M.; Miller, R.; Porter-Spalding, B.A. **Environmental and farm management factors associated with tuberculosis on cattle farms in northeastern Michigan.** *Journal of the American Veterinary Medical Association*. Sept 15, 2002. 221 (6) 837-842. ISSN: 0003-1488

**NAL Call Number:** 41.8 AM3

**Descriptors:** cattle, farms, tuberculosis, *Mycobacterium bovis*, farm management, environmental factors, risk factors, wild animals, disease prevalence, livestock numbers, ponds, streams, Michigan.

Kaneene, J.B.; VanderKlok, M.; Bruning-Fann, C.S.; Palmer, M.V.; Whipple, D.L.; Schmitt, S.M.; Miller, R.A. **Prevalence of *Mycobacterium bovis* infection in cervids on privately owned ranches.** *Journal of the American Veterinary Medical Association*. 2002. 220 (5) 656-659. ISSN: 0003-1488

**NAL Call Number:** 41.8 AM3

**Descriptors:** analytical methods, diagnosis, diagnostic techniques, disease prevalence, epidemiology, tuberculosis, Cervidae, coyotes, deer, tuberculosis, *Mycobacterium bovis*, wildlife, slaughter and skin testing, disease transmission, Michigan.

Kennedy, H.E.; Welsh, M.D.; Bryson, D.G.; Cassidy, J.P.; Forster, F.I.; Howard, C.J.; Collins, R.A.; Pollock, J.M. **Modulation of immune responses to *Mycobacterium bovis* in cattle depleted of WC1+ gammadelta T cells.** *Infection and Immunity*. Mar 2002. 70 (3) 1488-1500. ISSN: 0019-9567

**NAL Call Number:** QR1.I57

**Abstract:** It is accepted that cell-mediated immune responses predominate in mycobacterial infections. Many studies have shown that CD4(+) T cells produce Th1 cytokines, such as gamma interferon (IFN-gamma), in response to

mycobacterial antigens and that the cytolytic activity of CD8(+) cells toward infected macrophages is important. However, the extent and manner in which gammadelta T cells participate in this response remain unclear. In ruminants, gammadelta T cells comprise a major proportion of the peripheral blood mononuclear cell population. We have previously shown that WC1(+) gammadelta T cells are involved early in *Mycobacterium bovis* infection of cattle, but their specific functions are not well understood. Here we describe an in vivo model of bovine tuberculosis in which the WC1(+) gammadelta T cells were depleted from the peripheral circulation and respiratory tract, by infusion of WC1(+)-specific monoclonal antibody, prior to infection. While no effects on disease pathology were observed in this experiment, results indicate that WC1(+) gammadelta T cells, which become significantly activated (CD25(+)) in the circulation of control calves from 21 days postinfection, may play a role in modulating the developing immune response to *M. bovis*. WC1(+)-depleted animals exhibited decreased antigen-specific lymphocyte proliferative response, an increased antigen-specific production of interleukin-4, and a lack of specific immunoglobulin G2 antibody. This suggests that WC1(+) gammadelta TCR(+) cells contribute, either directly or indirectly, toward the Th1 bias of the immune response in bovine tuberculosis--a hypothesis supported by the decreased innate production of IFN-gamma, which was observed in WC1(+)-depleted calves.

**Descriptors:** T lymphocytes, lymphocyte transformation, cell mediated responses, calves, tuberculosis, *Mycobacterium bovis*.

Kim, J.H.; Sohn, H.J.; Kang, K.I.; Kim, W.I.; An, J.S.; Jean, Y.H. ***Mycobacterium bovis* infection in a farmed elk in Korea.** *Journal of Veterinary Science.* Sept 2002. 3 (3) 163-166. ISSN: 1229-845X

**URL:** <http://www.ksvs.or.kr>

**NAL Call Number:** SF604.J68

**Descriptors:** *Cervus elaphus*, game farming, animal diseases, *Mycobacterium bovis*, tuberculosis, case reports, postmortem examinations, lungs, lymph nodes, histopathology, abscesses, granuloma, Korea Republic.

Krayc, B. (ed) ; Schonthaler, D. *Tagungsbericht 1. Fachtagung fur Ziegenzuchter und halter zum Thema Ziegenzucht und Ziegenhaltung, 12. November und 13. November 2002, BAL Gumpenstein, Irdning, Austria. [Conference report. 1. Specialist conference for goat breeders and keepers on the theme of goat breeding and management. 12 and 13 November 2002 at BAL Gumpenstein, Austria.]* Published by Bundesanstalt fur alpenlandische Landwirtschaft Gumpenstein; Irdning; Austria 2002, 50 pp. Note: In German. A proceedings that includes 12 papers on a variety to topics.

**Descriptors:** breeding, EU, nutritional value of goat products, goats milk, grazing in alpine areas, feeding, Tauern Pied, tuberculosis, mastitis, Johne's disease, brucellosis, etc.

Kwong, L.S.; Hope, J.C.; Thom, M.L.; Sopp, P.; Duggan, S.; Bembridge, G.P.; Howard, C.J. **Development of an ELISA for bovine IL-10.** *Veterinary Immunology and Immunopathology.* 2002; 85 (3/4): 213-223. ISSN: 0165-2427

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Abstract:** The objective of the study was to develop an assay for bovine IL-10 that could be applied to analyses of immune responses and advance understanding of a variety of diseases of cattle. Recombinant bovine IL-10 (rbo IL-10) was transiently expressed in Cos-7 cells and shown to inhibit the synthesis of IFNgamma by bovine cells stimulated with antigen in vitro. Mice were immunised with a plasmid containing a cDNA insert encoding rbo IL-10 and inoculated with rbo IL-10. A number of monoclonal antibodies (mab) were generated that reacted with rbo IL-10 in an ELISA. Some of these mab neutralised the ability of rbo IL-10 to inhibit IFNgamma synthesis by antigen-stimulated bovine cells. A pair of mabs was identified that together could be used to detect both recombinant and natural bovine IL-10 present in supernatant of PBMC stimulated with ConA. A luminescent detection method was applied to the ELISA making it more sensitive. Using this method native IL-10 was detected in supernatants of PBMC, diluted blood and undiluted blood from cattle immunised with *Mycobacterium bovis* BCG or ovalbumin and incubated in vitro with antigen indicating the applicability of the assay to a number of in vitro culture systems.

**Descriptors:** cattle, interleukin 10, ELISA, monoclonal antibodies, interferon, recombinant DNA, complementary DNA, protein synthesis, inhibition.

Lis, H. **Wyniki badania sanitarno-weterynaryjnego zwierzat rzezných i miesa w Polsce w 2000 r. [Results of veterinary inspection of slaughtered animals and meat in Poland in 2000.]** *Medycyna Weterynaryjna.* 2002. 58 (4) 267-269. Note: In Polish with an English summary.

**NAL Call Number:** 41.8 M463

**Descriptors:** calves, carcasses, cysticercosis, diagnosis, echinococcosis, emaciation, food safety, jaundice, lesions, leukemia, liver flukes, meat, meat inspection, neoplasms, septicaemia, slaughter, trichinosis, tuberculosis, horses, *Mycobacterium tuberculosis*, pigs, sheep, *Trichinella*, Poland.

Livingstone, P.; McInnes, J.; Carter, C.; Ryan, T.; Hancox, N. **Controlling bovine tuberculosis in cattle where there is a wildlife source of infection.** *Bulletin of the International Dairy Federation*. 2002. No. 372, 33-42. Note: *A fresh perspective for managing milk-borne diseases. Proceedings of the Animal Health Conference, IDF World Dairy Summit 2001, Auckland, New Zealand, International Dairy Federation, Brussels, Belgium.*

**NAL Call Number:** 44.9 In82B

**Descriptors:** costs, dairy cattle, dairy herds, disease control, disease transmission, disease vectors, tuberculosis, vector control, wild animals, wild pigs, cattle, *Cervus elaphus*, ferrets, *Mycobacterium tuberculosis*, pigs, red deer, *Trichosurus vulpecula*, bovine tuberculosis, New Zealand.

Lysenko, A.P.; Rumachik, I.I. **Application of novel methods to differentiate reactions to tuberculin in cattle.**

*Veterinarnaya Nauka Proizvodstvu*. 2002; (36): 76-84. Note: In Russian.

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, differential diagnosis, tuberculin.

Michel, Anita L. **Implications of tuberculosis in African wildlife and livestock.** *Annals of the New York Academy of Sciences*. 2002; 969: 251-255 ISSN: 0077-8923

**NAL Call Number:** 500 N484

**Descriptors:** wild animals, livestock animals, mammals, literature review, *Mycobacterium bovis*, Ethiopian.

Michel, A.L. **Implications of tuberculosis in African wildlife and livestock.** In: E.P.J. Gibbs and B.H. Bokma, B.H. (editors). *The Domestic Animal/Wildlife Interface: Issues for Disease Control, Conservation, Sustainable Food Production, and Emerging Diseases Conference and Workshop Organised by the Society for Tropical Veterinary Medicine and the Wildlife Diseases Association Wildlife and Livestock, Disease and Sustainability: What Makes Sense? Pilanesberg National Park, South Africa, 22-27 July, 2001. Annals of New York Academy of Sciences Vol. 969. 2002: 251-255. ISBN: 1573314382*

**Descriptors:** cattle, wild animals, *Mycobacterium bovis*, *Papio ursinus*, *Potamochoerus porcus*, African buffalo, *Syncerus caffer*, *Tragelaphus scriptus*, *Tragelaphus strepsiceros*, *Panthero leo*, *Crocota crocuta*, disease control, disease transmission between wildlife species and domestic livestock.

Miller, J.M.; Jenny, A.L.; Payeur, J.B. **Polymerase chain reaction detection of *Mycobacterium tuberculosis* complex and *Mycobacterium avium* organisms in formalin-fixed tissues from culture-negative ruminants.** *Veterinary Microbiology*. June 5, 2002. 87 (1) 15-23. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Abstract:** In the US eradication program for bovine tuberculosis, a definitive diagnosis depends on the isolation of *Mycobacterium bovis*. However, in some cases bacterial culture is unsuccessful, even though the tissue is considered suspicious by histopathology because granulomatous lesions and acid-fast organisms are present. The purpose of this study was to determine if polymerase chain reaction (PCR) tests on formalin-fixed tissue would successfully identify the organisms observed in suspect lesions from culture-negative animals. Diagnostic laboratory records were used to select paraffin blocks of tissue from 102 ruminants that had suspect microscopic lesions but no bacterial isolation. Sections from these blocks were examined with PCR primers for IS6110 to detect *Mycobacterium tuberculosis* complex infection, or with 16S ribosomal RNA and IS900 primers for detection of *Mycobacterium avium*. The PCR tests successfully identified a mycobacterial infection in 58 of 102 tissues, including 41 *M. tuberculosis* complex and 17 *M. avium* (11 subspecies paratuberculosis). These results demonstrate that PCR testing of formalin-fixed tissue, in combination with bacterial culture, may increase the effectiveness of laboratory diagnostic efforts to detect and identify the most common mycobacterial diseases of ruminants.

**Descriptors:** *Mycobacterium tuberculosis*, *Mycobacterium avium*, polymerase chain reaction, PCR, detection, diagnosis, formaldehyde, lesions, ribosomal RNA.

Mota, P.M.P.C.; Lobato, F.C.F.; Assis, R.A.; Lage, A.P.; Parreiras, P.M.; Leite, R.C. **Ocorrência de tuberculose em rebanhos bubalinos (*Bubalus bubalis* var. *bubalis*-Linneus, 1758) no Município de Parintins, Amazonas.**

[Occurrence of tuberculosis in herds of buffaloes of Amazonas State, Brazil.] *Arquivo Brasileiro de Medicina*

*Veterinaria e Zootecnia*. 2002, 54 (4) 441-443. Note: In Portuguese with an English summary.

**NAL Call Number:** SF604 A76

**Descriptors:** diagnosis, herds, lymph nodes, tuberculosis, buffalo, *Bubalus bubalis*, *Mycobacterium bovis*, Amazonas, Brazil.

Palmer, M.V.; Waters, W.R.; Whipple, D.L. **Aerosol delivery of virulent *Mycobacterium bovis* to cattle. Tuberculosis**. 2002, 82 (6) 275-282.

**Descriptors:** cattle calves, 2 strains of *Mycobacterium bovis*, HC2005T, isolate 1315 from deer, aerosol delivery model, tuberculosis infection, tuberculous lesions, lungs, lymph nodes, virulence, no strain differences.

Pavlik, I.; Ayele, W.Y.; Parmova, I.; Melicharek, I.; Hanzlikova, M.; Kormendy, B.; Nagy, G.; Cvetnic, Z.; Ocepek, M.; Fejzic, N.; Lipiec, M. **Incidence of bovine tuberculosis in cattle in seven Central European countries during the years 1990-1999. Veterinarni Medicina**. 2002. 47 (2-3) 45-51.

**NAL Call Number:** 41.9 C333

**Descriptors:** epidemiology, outbreaks, skin tests, cattle, bovine tuberculosis, *Mycobacterium*, Bosnia Hercegovina, Croatia, Central Europe, Czech Republic, Hungary, Poland, Slovakia, Slovenia.

Pavlik, I.; Machackova, M.; Ayele, W.Y.; Lamka, J.; Parmova, I.; Melicharek, I.; Hanzlikova, M.; Kormendy, B.; Nagy, G.; Cvetnic, Z.; Ocepek, M.; Lipiec, M. **Incidence of bovine tuberculosis in wild and domestic animals other than cattle in six Central European countries during 1990-1999. Veterinarni Medicina**. 2002. 47 (5) 122-131.

**NAL Call Number:** 41.9 C333

**Descriptors:** disease prevalence, disease transmission, domestic animals, epidemiology, game animals, tuberculosis, sheep, boars, wild goats, *Bison bison*, *Bison bonasus*, *Camelus bactrianus*, Bactrian camels, *Casuarus*, cassowary, *Cervus elaphus*, *Connochaetes taurinus*, dogs, zoo animals, *Felis concolor*, puma, sitatungas, elands, gnu, Vietnamese pot-bellied pig, *Giraffa camelopardalis*, giraffes, *Mycobacterium bovis*, pigs, red deer, sheep, *Tapirus terrestris*, *Taurotragus oryx*, *Tragelaphus*, Central Europe.

Pavlik, I.; Bures, F.; Janovsky, P.; Pecinka, P.; Bartos, M.; Dvorska, L.; Matlova, L.; Kremer, K.; van Soelingen, D. **The last outbreak of bovine tuberculosis in cattle in the Czech Republic in 1995 was caused by *Mycobacterium bovis* subspecies *caprae*. Veterinarni Medicina**. 2002. 47 (9) 251-263.

**NAL Call Number:** 41.9 C333

**Descriptors:** *Mycobacterium bovis* ssp *caprae* bovine tuberculosis, 14 year old cow, case study, herd health, source, Czech Republic.

Pavlik, I.; Dvorska, L.; Matlova, L.; Svastova, P.; Parmova, I.; Bazant, J.; Veleba, J. **Mycobacterial infections in cattle in the Czech Republic during 1990-1999. Veterinarni Medicina**. 2002. 47 (9) 241-250.

**NAL Call Number:** 41.9 C333

**Descriptors:** cattle, tuberculin testing, post-mortem diagnosis, bovine tuberculosis, skin testing, tuberculin, tuberculosis lesions, *Mycobacterium bovis*, disease incidence data, Czech Republic.

Payeur, Janet B.; Church, S.; Mosher, L.; Robinson-Dunn, B.; Schmitt, S.; Whipple, D. **Bovine tuberculosis in Michigan wildlife. Annals of the New York Academy of Sciences**. 2002; 969: 259-261 ISSN: 0077-8923

**NAL Call Number:** 500 N484

**Descriptors:** wild animals, bacterial diseases, *Mycobacterium bovis*, prevalence in wildlife and livestock, wild animal as disease reservoirs, Michigan.

Perez, A.; Debenedetti, R.; Martinez-Vivot, M.; Bernardelli, A.; Torres, P.; Ritacco, V. **Tendencia de la tuberculosis porcina y validez de la inspeccion bromatologica para su deteccion en areas de produccion intensiva de Argentina. [Swine tuberculosis validity of the macroscopic inspection at slaughter level.] Revista de Medicina Veterinaria, Buenos Aires**. 2002. 83 (1) 14-18. Note: In Spanish with an English summary.

**NAL Call Number:** 41.8 B86

**Descriptors:** bacteriology, carcass quality, carcasses, post-slaughter diagnosis, digestive tract, disease prevalence, histopathology, macroscopic meat inspection, slaughter, tuberculosis, *Mycobacterium bovis*, pigs, Argentina.

Perez, A.M.; Ward, M.P.; Ritacco, V. **Simulation model evaluation of bovine tuberculosis-eradication strategies in Argentine dairy herds. Preventive Veterinary Medicine**. Aug 30, 2002. 54 (4) 351-360. ISSN: 0167-5877

**NAL Call Number:** SF601.P7

**Descriptors:** dairy herds, cattle, tuberculosis, simulation models, disease control, infection, culling of diseased animals, diagnostic techniques and tests, epidemiology, *Mycobacterium bovis*, Argentina.

Perez, A.M.; Ward, M.P.; Charmandarian, A.; Ritacco, V. **Simulation model of within-herd transmission of bovine tuberculosis in Argentine dairy herds.** *Preventive Veterinary Medicine*. Aug 30, 2002. 54 (4) 361-372. ISSN: 0167-5877

**NAL Call Number:** SF601.P7

**Descriptors:** dairy herds, cattle, *Mycobacterium bovis*, disease transmission, simulation models, tuberculosis, estimation of disease prevalence, infectivity, Argentina.

Perez, A.M.; Ward, M.P.; Torres, P.; Ritacco, V.; Durr, P. (ed.); Pfeiffer, D. **Use of spatial statistics and monitoring data to identify clustering of bovine tuberculosis in Argentina.** *Preventive Veterinary Medicine*. 2002. 56 (1) 63-74.

Note: Spatial Epidemiology Research Papers prepared for and presented at the GISVET Conference, Lancaster University, England, 10-14 September 2001.

**NAL Call Number:** SF601 P7

**Descriptors:** dairy cattle, cattle, disease distribution, epidemiology, geographical/spatial distribution, statistical analysis, tuberculosis, bovine tuberculosis, *Mycobacterium*, Argentina.

Phillips, C.J.C.; Foster, C.R.W.; Morris, P.A.; Teverson, R. **Genetic and management factors that influence the susceptibility of cattle to *Mycobacterium bovis* infection.** *Animal Health Research Reviews*. 2002. 3 (1) 3-13.

**NAL Call Number:** SF601 A547

**Descriptors:** animal husbandry, disease control, disease resistance, disease transmission, genetic factors, genetic variation, genotype, environment interaction, immune response, immunity, immunostimulation, risk assessment, risk factors, risk reduction, susceptibility, tuberculosis, vaccination, cattle, *Mycobacterium bovis*.

Pinto, P.S.A.; Faria, J.E.; Vilorio, M.I.V.; Bevilacqua, P.D. **Exame microbiológico da tuberculose como subsidio a inspecao post-mortem de bovinos. [Bacteriological analysis of tuberculosis as a support to bovine postmortem inspection.]** *Revista Brasileira de Saude e Producao Animal*. 2002; 3 (1): 10-15. ISSN: 1519-9940. Note: In: Portuguese with an English summary.

**Descriptors:** beef cattle, humans, *Mycobacterium bovis*, animal pathology, disease transmission, disease prevalence, disease surveys, diagnosis, diagnostic techniques, disease transmission, epidemiological surveys, epidemiology, microbial contamination of food, meat hygiene, meat inspection, postmortem examinations, tuberculin, tuberculosis, zoonoses.

Pollock, J.M.; Neill, S.D. ***Mycobacterium bovis* infection and tuberculosis in cattle.** *Veterinary Journal*. Mar 2002. 163 (2) 115-127. ISSN: 1090-0233

**URL:** <http://intl.elsevierhealth.com/journals/tvj/>

**NAL Call Number:** SF601.V484

**Abstract:** This review considers the possible events that can occur when cattle are exposed to *Mycobacterium bovis* and, where appropriate, draws on principles accepted for tuberculosis infection in humans and laboratory animal models. Consideration is given to the many complex factors which influence the outcome of challenge with tubercle bacilli. These include features inherent to the *Mycobacterium*, the host and the environment. It is apparent that clinical disease probably occurs only in a relatively small, but undetermined, proportion of cattle that are exposed to *M. bovis*. The majority of animals may clear infection or control the bacilli, possibly in a condition of latency. It is concluded that a better understanding of the dynamics of the events following *M. bovis* exposure and subsequent infection in cattle would be of significant benefit in developing new tools appropriate for disease control and to designing optimal approaches for their application.

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculosis, pathogenesis, disease control, infection, shedding, immune system, immune response, latent infections, literature review.

Pons, L. **An easy, inexpensive test detects tuberculosis in livestock and wildlife.** *Agricultural Research*. Nov 2002. 50 (11) 20-21. ISSN: 0002-161X

**URL:** <http://www.ars.usda.gov/is/AR/>

**NAL Call Number:** 1.98 Ag84

**Descriptors:** tuberculosis, animal diseases, livestock, wildlife, testing and disease control, *Mycobacterium bovis*, blood sampling, diagnostic techniques, assays, USA.

Prodinger, W.M.; Eigentler, A.; Allerberger, F.; Schonbauer, M.; Glawischnig, W. **Infection of red deer, cattle, and humans with *Mycobacterium bovis* subsp. *caprae* in western Austria.** *Journal of Clinical Microbiology*. June 2002. 40 (6) 2270-2272. ISSN: 0095-1137

**NAL Call Number:** QR46.J6

**Descriptors:** tuberculosis, red deer, cattle, zoonotic aspects, epidemiology, disease transmission, *Mycobacterium bovis* ssp. *caprae*.

Ramsey, D.; Spencer, N.; Caley, P.; Efford, M.; Hansen, K.; Lam, M.; Cooper, D. **The effects of reducing population density on contact rates between brushtail possums: implications for transmission of bovine tuberculosis.** *Journal of Applied Ecology*. 2002. 39 (5) 806-818.

**NAL Call Number:** 410 J828

**Descriptors:** animal behavior, animal ecology, breeding season, contacts, disease transmission, mating behavior, estrus, population density, reservoir hosts, tuberculosis, wild animals, *Mycobacterium bovis*, *Trichosurus vulpecula*, New Zealand.

Rogers, L.M.; Hounscome, T.D.; Cheeseman, C.L. **An evaluation of passive integrated transponders (PITs) as a means of permanently marking Badgers (*Meles meles*).** *Mammal Review*. 2002, 32 (1) 63-65. ISSN: 0305-1838

**NAL Call Number:** QL700.M24

**Descriptors:** badgers, cattle, *Meles meles*, *Mycobacterium bovis*, identification, markers, sentinel animals, sentinel surveillance, transponders, tuberculosis, England.

Schmitt, Stephen M.; O'Brien, Daniel J.; Bruning-Fann, Colleen S.; Fitzgerald, Scott D. **Bovine tuberculosis in Michigan wildlife and livestock.** *Annals of the New York Academy of Sciences*. 2002; 969: 262-268 ISSN: 0077-8923

**NAL Call Number:** 500 N484

**Descriptors:** wild animals, bacterial diseases, *Mycobacterium bovis*, prevalence in wildlife and livestock, Michigan.

Schneider, M.; Molinar, R.; Magnano, G.; Giraudo, J.; Escalarea, M. **Tuberculosis bovina en campos con saneamiento avanzado. [Bovine tuberculosis in farms with advanced sanitary schemes.]** *Veterinaria Argentina*. 2002, 19 (189) 652-660. Note: In Spanish with an English summary.

**NAL Call Number:** SF604.V463

**Descriptors:** dairy cattle, *Mycobacterium*, eradication program, diagnostic techniques, disease control and prevention program, tuberculosis, Argentina.

Seva, J.; Menchen, V.; Navarro, J.A.; Pallares, F.J.; Villar, D.; Vasquez, F.; Bernabe, A. **Caprine tuberculosis eradication program: an immunohistochemical study.** *Small Ruminant Research*. 2002. 46 (2-3) 107-114. ISSN: 0921-4488

**NAL Call Number:** SF380.I52

**Abstract:** We studied the evolution of different forms of tuberculosis in herds which are periodically submitted to the comparative tuberculin intradermal reaction (CTID) test within the Caprine Tuberculosis Eradication Program in the Region of Murcia (Spain). In the study, 135 goats with tuberculosis from different herds were diagnosed by histopathological and immunocytochemical techniques. Most animals (58 of the 135) were in the primary complex of tuberculosis, with few or no acid-fast bacilli (AFB) and mycobacterial antigens. Generalized tuberculosis was present in 31 of the 135 animals, and the numbers of bacilli and positive immunocytochemical particles were higher than in animals with the primary complex. Postprimary phase was observed in 44 of the 135 animals, and the number of bacilli and positive immunocytochemical particles increased in proportion to the extent and gravity of the necrotic foci.

Tuberculous pneumonia with a high number of bacilli was only observed in two goats. Extrapulmonary tuberculosis was present with lesions in the intestines (60/135), liver (80/135) and spleen (77/135). This study confirmed that the Caprine Tuberculosis Eradication Program is resulting in fewer animals with postprimary tuberculous processes, and a corresponding increase in the number of primary complex and generalized tuberculosis.

**Descriptors:** control programs, disease control, extrapulmonary tuberculosis, intestines, liver, immunohistochemistry, lesions, spleen, tuberculosis, goats, *Mycobacterium bovis*, Spain.

Skjerve, E.; Smulders, F.J.M. (ed.); Collins, J.D. **Emerging pathogenic bacteria of special interest: epidemiological concerns.** *Food Safety Assurance and Veterinary Public Health, Volume 1. Food Safety Assurance in the Pre-harvest Phase.* 2002. p. 141-152. Wageningen Academic Publishers; Wageningen; Netherlands.

**NAL Call Number:** IPSP12358

**Descriptors:** animal health, drug resistance, epidemiology, food contamination, food production, food safety, foodborne diseases, public health risk assessment, salmonellosis, tuberculosis zoonoses, *Bacillus cereus*, *Escherichia coli*, *Mycobacterium avium* ssp. *paratuberculosis*, *Salmonella enteritidis*, *Salmonella typhimurium*.

Spedding, A. **Review of the year, June 2001 - May 2002.** *Journal of the Royal Agricultural Society of England.* 2002, 163: 188-194.

**NAL Call Number:** 10 F81

**Descriptors:** cattle diseases, livestock animals, agricultural policy, agricultural prices, BSE. Bovine spongiform encephalopathy, climatic change; disease prevalence, economic impact, FMD, foot and mouth disease; livestock, subsidies, bovine tuberculosis, European Union Countries, UK.

Suliman, M.S.; Hamid, M.E. **Identification of acid fast bacteria from caseous lesions in cattle in Sudan.** *Journal of Veterinary Medicine. Series B.* 2002, 49 (9) 415-418. ISSN: 0931-1793

**NAL Call Number:** 41.8 Z52

**Descriptors:** cattle, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium farcinogenes*, *Mycobacterium tuberculosis*, *Nocardia*, caseous lesions, post-slaughter, lymph nodes, acid-fast bacteria strains, Sudan.

Toma, B.; Pouillot, R.; Sanaa, M. **Appreciation quantitative du risque: exemples d'approche deterministe. [Quantitative risk assessment: examples of a deterministic approach.]** *Epidemiologie et Sante Animale.* 2002, No.41, 85-94. ISSN: 0754-2186 Note: In French with an English summary.

**Descriptors:** cattle, *Brucella*, *Mycobacterium*, tuberculosis, brucellosis, deterministic models, disease transmission, imported infections, international trade, livestock, mathematical models, risk assessment.

Trautwein G. **Erkennung und Bekämpfung der Rindertuberkulose. [Diagnosis and control of bovine tuberculosis.]** *Der Praktische Tierarzt.* 2002. 83 (2) 164-164, 170. Note: In German with an English summary.

**NAL Call Number:** 41.8 P88

**Descriptors:** diagnosis, disease control, tuberculosis, cattle, *Mycobacterium bovis*.

Valente, C.; Cuteri, V.; Ausili, E.; Piersimoni, C. **Evaluation of the Abbott LCx *Mycobacterium tuberculosis* assay for direct detection of *Mycobacterium bovis* in bovine tissue samples.** *Veterinary Research Communications.* Jan 2002. 26 (1) 21-27. ISSN: 0165-7380

**NAL Call Number:** SF601.V38

**Descriptors:** *Mycobacterium tuberculosis*, *Mycobacterium bovis*, detection, diagnostic techniques, evaluation, species differences, cattle, lymph nodes, histopathology, ligases.

Varga, J. **Hazai szarvasmarha-allomanyaink mentesitese nehany fertozo betegsegtol. [Eradication of some diseases from cattle herds in Hungary.]** *Magyar Allatorvosok Lapja.* 2002. 124 (6) 327-332. Note: In Hungarian with an English summary.

**NAL Call Number:** 41.8 V644

**Descriptors:** cattle diseases, disease control, bovine leucosis, tuberculosis, brucellosis, diarrhea, FMD, foot and mouth disease, herpesvirus, Hungary.

Vordermeier, H.M.; Chambers, M.A.; Cockle, P.J.; Whelan, A.O.; Simmons, J.; Hewinson, R.G. **Correlation of ESAT-6-specific gamma interferon production with pathology in cattle following *Mycobacterium bovis* BCG vaccination against experimental bovine tuberculosis.** *Infection and Immunity.* 2002. 70 (6) 3026-3032. ISSN: 0019-9567

**NAL Call Number:** QR1.157

**Abstract:** Vaccine development and the understanding of the pathology of bovine tuberculosis in cattle would be greatly facilitated by the definition of immunological correlates of protection and/or pathology. To address these questions, cattle were vaccinated with *M. bovis* bacillus Calmette-Guerin (BCG) and were then challenged with virulent *M. bovis*. Applying a semiquantitative pathology-scoring system, we were able to demonstrate that BCG vaccination imparted significant protection by reducing the disease severity on average by 75%. Analysis of cellular immune responses following *M. bovis* challenge demonstrated that proliferative T-cell and gamma interferon (IFN-gamma)

responses towards the *M. bovis*-specific antigen ESAT-6, whose gene is absent from BCG, were generally low in vaccinated animals but were high in all nonvaccinated calves. Importantly, the amount of ESAT-6-specific IFN-gamma measured by enzyme-linked immunosorbent assay after *M. bovis* challenge, but not the frequency of responding cells, correlated positively with the degree of pathology found 18 weeks after infection. Diagnostic reagents based on antigens not present in BCG, like ESAT-6 and CFP-10, were still able to distinguish BCG-vaccinated, diseased animals from BCG-vaccinated animals without signs of disease. In summary, our results suggest that the determination of ESAT-6-specific IFN-gamma, while not a direct correlate of protection, constitutes nevertheless a useful prognostic immunological marker predicting both vaccine efficacy and disease severity.

**Descriptors:** BCG vaccine, cattle, calves, cell mediated immunity, immune response, ESAT-6-specific IFN gamma, ELISA, immunization, interferon, *Mycobacterium bovis*, tuberculosis, vaccination.

Walravens, K.; Marche, S.; Rosseels, V.; Wellemans, V.; Boelaert, F.; Huygen, K.; Godfroid, J.; Fossum, C. (ed.); Watrang, E. **IFN-gamma diagnostic tests in the context of bovine mycobacterial infections in Belgium.** *Veterinary Immunology and Immunopathology*. 2002. 87 (3-4) 401-406. ISSN: 0165-2427. Note: 6th International Veterinary Immunology Symposium, Ultuna Campus, Swedish University of Agricultural Sciences, Uppsala, Sweden, July 2001.

**NAL Call Number:** SF757.2 V38

**Abstract:** In countries where cattle tuberculosis caused by *Mycobacterium bovis* (*Mbov*) and paratuberculosis caused by *Mycobacterium avium* subsp. *paratuberculosis* (*Mptb*) are present, testing strategies for the *Mbov* eradication have to discriminate between these two infections. Present indirect tests are based on the analysis of the specific cellular immune response (DTH, IFN-gamma) against crude mycobacterial antigens (avian and bovine PPD). In this study, we compared the evolution of the IFN-gamma responses of animals experimentally infected with *Mbov*, *Mptb*, or inoculated with *Mycobacterium phlei*. *Mbov* inoculation induced a strong IFN-gamma response that allows rapid classification of the status of the animals following interpretation criteria set up by us. Experimental inoculation with *M. phlei* induced sensitization to mycobacterial antigens as detected by the IFN-gamma test but these reactions were of short duration, therefore, repeated testing allows us to define these animals as a specific reactors. IFN-gamma response induced after oral inoculation of calves with *Mptb* was of low intensity and ratio of responses measured against avian versus bovine PPD did not allow a clear diagnostic at least for the six first month of infection.

**Descriptors:** *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium phlei*, cattle diseases, diagnosis, experimental infection, immune responses, interferon, IFN-gamma response, Belgium.

Walravens, K.; Wellemans, V.; Weynants, V.; Boelaert, F.; de Bergeyck, V.; Letesson, J.J.; Huygen, K.; Godfroid, J.

**Analysis of the antigen-specific IFN-gamma producing T-cell subsets in cattle experimentally infected with *Mycobacterium bovis*.** *Veterinary Immunology & Immunopathology*. 2002; 84 (1/2): 29-41. ISSN: 0165-2427

**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)

**NAL Call Number:** SF757.2.V38

**Abstract:** Three 10 months old cattle were infected by the intra-tracheal route with 10(6) cfu of a field strain of *Mycobacterium bovis*. Blood samples were regularly collected for in vitro IFN-gamma production after antigenic stimulation. Peripheral blood cells of infected animals produced IFN-gamma in response to crude *M. bovis* antigens (live and heat-inactivated BCG and protein-purified derivative (PPD)) 3-4 weeks after infection. The ratio of the response to bovine PPD versus avian PPD indicated a specific sensitisation for *M. bovis* antigens. Three months post-infection (PI), animals were culled and *M. bovis* was cultured from tubercle lesions. At different time points, the frequency of specific *M. bovis* IFN-gamma producing CD4+, CD8+ and WC1+ T-cells in the peripheral blood was examined by flow cytometry. Two colour immunofluorescence staining of intracellular IFN-gamma and bovine cell surface molecules showed that both CD4+ and CD8+, but not WC1+, T-cells produced IFN-gamma following stimulation with PPD, live or killed BCG. In two animals analysed, the relative percentage of circulating IFN-gamma producing CD8+ cells decreased between week 5 and week 9 PI. The same evolution was not observed for IFN-gamma secreting CD4+ cells. Magnetic positive selection of T-cells from infected animals showed that CD4+ T-cells produced specific IFN-gamma only in the presence of antigen presenting cells (APCs). Positively selected CD8+ T-cells secreted IFN-gamma only in the presence of recombinant human IL-2 and APCs. In vitro depletion of the CD4+ T-cells, but not the depletion of CD8+ or WC1+ T-cells, resulted in abrogation of the specific IFN-gamma production showing the key role of this cell population for the specific IFN-gamma production.

**Descriptors:** cattle, *Mycobacterium bovis*, antigens, interferon, T-lymphocytes, experimental infections, lesions, CD4+-lymphocytes, CD8+-lymphocytes, flow-cytometry, WC1+-lymphocytes.

Watson, C.W. **An investigation into the possible relationships between BVD and TB in practice.** *Cattle Practice*. 2002. 10 (2) 101-103.

**NAL Call Number:** SF961 C37

**Descriptors:** beef cattle, cows, dairy cows, epidemiology, outbreaks, tuberculosis, vaccination, cattle, *Mycobacterium bovis*.

Wedlock, D.N.; Keen, D.L.; McCarthy, A.R.; Andersen, P.; Buddle, B.M. **Effect of different adjuvants on the immune responses of cattle vaccinated with *Mycobacterium tuberculosis* culture filtrate proteins.** *Veterinary Immunology and Immunopathology*. May 2002. 86 (1/2) 79-88. ISSN: 0165-2427

**NAL Call Number:** SF757.2.V38

**Abstract:** The development of improved vaccines for bovine tuberculosis is urgently required as a cost effective solution for control and eventual eradication of tuberculosis in domestic animals. Studies in small animal models of tuberculosis have shown that vaccination with culture filtrate proteins (CFP), prepared from *Mycobacterium tuberculosis* or *M. bovis*, can induce cellular immune responses and confer a level of protection against aerogenic challenge with virulent mycobacteria. As a first step in the development of a mycobacterial CFP vaccine for protection of cattle against bovine tuberculosis, the immune responses of cattle vaccinated with short-term culture filtrate proteins (ST-CFP) from *M. tuberculosis* and formulated with different adjuvants were compared with those vaccinated with bacille Calmette-Guerin (BCG). The adjuvants included dimethyldioctyldecyl ammonium bromide (DDA), diethylaminoethyl (DEAE)-dextran, and ST-CFP adsorbed onto polystyrene beads. Vaccination with ST-CFP/DEAE-dextran induced high levels of interleukin-2 (IL-2) but low levels of interferon-gamma (IFN-gamma) from whole-blood cultures stimulated with *M. tuberculosis* ST-CFP in comparison with the strong IFN-gamma and IL-2 responses induced after vaccination with BCG. ST-CFP/DEAE-dextran also induced a strong antigen-specific immunoglobulin antibody response with both immunoglobulin G1 (IgG1 and IgG2 isotypes). Vaccination with ST-CFP/beads induced a weak IgG1-biased antibody response but no IFN-gamma or IL-2 response. DDA did not induce significant immune responses in animals vaccinated with ST-CFP. In comparison to the moderate delayed-type hypersensitivity (DTH) responses induced by vaccination with subcutaneous BCG, none of the ST-CFP vaccines induced a significant DTH response to either *M. tuberculosis* ST-CFP or bovine purified protein derivative (PPD). While the ST-CFP vaccines used in this study have not induced strong antigen-specific cellular immune responses in cattle comparable to those induced by BCG, they are immunogenic in cattle and it may be possible to overcome this problem by using adjuvants that more effectively promote IFN-gamma responses in this species.

**Descriptors:** cattle, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, adjuvants, immune response, vaccination, vaccines, culture filtrates, cell mediated immunity, humoral immunity, tuberculosis, interferon, interleukin-2, dimethyldioctyldecyl ammonium bromide, diethylaminoethyl dextran, subunit vaccines.

White, P.; Smulders, F.J.M. (ed.); Collins, J.D. **The disclosure of tuberculous lesions at slaughter in cattle from attested herds in CO. Monaghan in 1995.** *Food Safety Assurance and Veterinary Public Health, Volume 1. Food Safety Assurance in the Pre-harvest Phase*. 2002. p. 302-305. Wageningen Academic Publishers; Wageningen; Netherlands. ISBN: 90-769980-51

**NAL Call Number:** IPSP12358

**Descriptors:** lesions, meat quality, tuberculosis, cattle, *Mycobacterium tuberculosis*, Irish Republic.

Wilson, P.R. **Advances in health and welfare of farmed deer in New Zealand.** *New Zealand Veterinary Journal*. 2002. 50 (3, Supplement) 105-109.

**NAL Call Number:** 41.8 N483

**Descriptors:** animal health, animal welfare, antlers, capture of animals, deer farming, malignant catarrhal fever, mortality from tuberculosis, *Mycobacterium*, New Zealand.

Yamamoto, S.; Yamamoto, T.; Nojima, Y.; Umemori, K.; Phalen, S.; McMurray, D.N.; Kuramoto, E.; Iho, S.; Takauji, R.; Sato, Y.; Yamada, T.; Ohara, N.; Matsumoto, S.; Goto, Y.; Matsuo, K.; Tokunaga, T. **Discovery of immunostimulatory CpG-DNA and its application to tuberculosis vaccine development.** *Japanese Journal of Infectious Diseases*. 2002. 55 (2) 37-44. Note: In English.

**Descriptors:** adjuvants, BCG vaccine, biotechnology, DNA vaccine development, molecular genetics, immunostimulants, nucleotide sequences, reviews, *Mycobacterium bovis* BCG strain, *Mycobacterium tuberculosis*, antineoplastic properties.

Aldwell, F. E.; Wedlock, D.N.; Slobbe, L.J.; Griffin, J.F.T.; Buddle, B.M.; Buchan, G.S.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **In vitro control of *Mycobacterium bovis* by macrophages.** *Tuberculosis*. 2001. 8 (1-2) 115-123.

Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** cattle, deer, mice, marsupials, ferrets, growth, host range, in vitro testing, alternatives to animal testing, inhibition, interferon, macrophages, lungs, lipopolysaccharides, macrophage activation, *Mycobacterium bovis*, *Mycobacterium bovis* BCG, *Mycobacterium tuberculosis*.

Anonymous. **Policy in limbo.** *Veterinary Record*. Aug 11, 2001. 149 (6) 161. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** tuberculosis in cattle, disease control policies, *Mycobacterium bovis*, UK.

Anonymous. **State veterinary activity: challenges faced and the challenges to come.** *Veterinary Record*. June 9, 2001. 148 (23) 701-702. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** animal health, disease surveys, outbreaks, swine fever, tuberculosis, *Mycobacterium*, transport of animals, disease control, Great Britain.

Anonymous. **Stretched to the limit.** *Veterinary Record*. Jan 20, 2001. 148 (3) 61. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle tuberculosis, *Mycobacterium*, disease control, badgers, culling, UK.

Avylov, Ch. **Problems of rat control on pig farms.** *Svinovodstvo*. Moskva. 2001. No. 3, 17-20. Note: In Russian.

**NAL Call Number:** 46.8 SV33

**Descriptors:** rats as disease vectors, zoonotic disease, pig farms, dead and trapped rats, *Brucella*, brucellosis, tuberculosis, *Mycobacterium*, leptospirosis, pest control and eradication.

Barrett, D.C. **Biosecurity and herd health -- a challenge for the 21st century.** *Cattle Practice*. 2001. 9 (2) 97-103.

**NAL Call Number:** SF961 C37

**Descriptors:** animal health, biosecurity, disease transmission, infectious diseases, cattle, poultry, tuberculosis, *Mycobacterium bovis*, pigs.

Barrett, D.C.; Sibley, R.J.; Taylor, A.J. **British cattle veterinary association -- TB isolation and test protocol.** *Cattle Practice*. 2001. 9 (2) 147-150.

**NAL Call Number:** SF961 C37

**Descriptors:** cattle, diagnosis, disease transmission, isolation, quarantine, reviews, tuberculosis, *Mycobacterium bovis*.

Barua, A.G.; Singh, N.B.; Barua, C.C.; Raisuddin, S. **IL-1beta, TNF and IL-6 mediated activation in murine by *Mycobacterium habana*, a candidate vaccine strain against tuberculosis.** *Indian Journal of Comparative Microbiology, Immunology and Infectious Diseases*. 2001. 22 (2) 178-180.

**Descriptors:** candidate vaccines, cytokines, immunization, interleukin-6, interleukins, murine macrophages, BALB/c mice, tuberculosis, tumour necrosis factor, cytokine production, vaccination, vaccine development, zoonoses, *Mycobacterium tuberculosis*, *Mycobacterium habana*.

Bellamine, A.; Mangla, A.T.; Dennis, A.L.; Nes, W.D.; Waterman, M.R. **Structural requirements for substrate recognition of *Mycobacterium tuberculosis* 14alpha-demethylase: implications for sterol biosynthesis.** *Journal of Lipid Research*. Jan 2001. 42 (1) 128-136. ISSN: 0022-2275

**NAL Call Number:** 381 J8282

**Descriptors:** cytochrome p 450, cholesterol, substrates, binding, *Mycobacterium tuberculosis*.

Beytut, E. **Kars ili ve yoresinde sigirlarda tuberkuloz insidensi ve lezyonların lokalizasyonu üzerine patolojik incelemeler.** [Pathological examinations on the localization of lesions and incidence of tuberculosis in cattle in Kars City and its surrounding.] *Kafkas Universitesi Veteriner Fakültesi Dergisi*. 2001. 7 (1) 15-25. Note: In Turkish with an English summary.

**Descriptors:** disease, incidence, lesion localization, cattle tuberculosis, *Mycobacterium*, ZN staining, granulomas,

lungs, lymph nodes, cattle.

Buddle, B.M.; Ryan, T.J.; Pollock, J.M.; Andersen, P.; de Lisle, G.W. **Use of ESAT-6 in the interferon-gamma test for diagnosis of bovine tuberculosis following skin testing.** *Veterinary Microbiology*. May 3, 2001. 80 (1) 37-46. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Abstract:** The whole blood interferon-gamma (IFN-gamma) test has proven to be a practical ancillary test for re-testing cattle for bovine tuberculosis 8-28 days following tuberculin skin testing. An improvement in the specificity of the IFN-gamma test could further reduce culling of false positive animals. The primary aim of this study was to evaluate a single mycobacterial antigen, ESAT-6 in the IFN-gamma test for use in skin test-positive cattle. These skin test-positive cattle comprised 51 *Mycobacterium bovis*-infected animals from tuberculosis-infected herds and 85 non-infected animals from tuberculosis-free herds. The test based on ESAT-6 had a higher specificity than the test based on purified protein derivative (PPD) tuberculin, but this was offset by a small decrease in sensitivity. Use of a lower cut-off in the ESAT-6-based test improved the sensitivity, while still maintaining a very high specificity. A secondary aim in the study was to assess the ESAT-6 and PPD-based tests for detecting bovine tuberculosis in skin test-negative animals from a persistently infected herd. The PPD-based test detected the majority of the lesioned or *M. bovis*-culture positive animals, while the ESAT-6-based test detected a smaller proportion. The false negatives in the IFN-gamma test from both the skin test-negative and positive groups were predominantly *M. bovis*-culture positive animals with no visible lesions. The current study has shown that a defined specific antigen such as ESAT-6 can markedly improve the specificity of the IFN-gamma test for re-testing skin test-positive animals. An ESAT-6-based IFN-gamma test could be particularly useful to reduce the false positive rate, yet still maintain an acceptable level of sensitivity.

**Descriptors:** cows, tuberculosis, interferon, diagnosis, diagnostic skin tests, blood chemistry, tuberculin, culling, antigens, diagnostic techniques, evaluation, *Mycobacterium bovis*.

Buddle, B.M.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Vaccination of cattle against *Mycobacterium bovis*.** *Tuberculosis*. 2001. 81 (1-2) 125-132. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** *Mycobacterium bovis*, cattle, vaccination, BCG vaccine, candidate vaccines, vaccine development, disease control and prevention, DNA vaccines, immunization, live vaccines, tuberculosis, reviews.

Caldow, G.; Gunn, G.; Humphry, R.; Crawshaw, M.; Rusbridge, S. **Biosecurity and screening for disease.** *Irish Veterinary Journal*. 2001. 54 (9) 461-470.

**NAL Call Number:** 41.8 IR4

**Descriptors:** diagnostic accuracy, cattle diseases, control programs, diagnostic techniques, disease prevention and control, neosporosis, paratuberculosis, salmonellosis, tuberculosis, *Mycobacterium*, bovine diarrhea virus, herpesvirus-1, *Leptospira*.

Cassidy, J.P.; Bryson, D.G.; Cancela, M.M.G.; Forster, F.; Pollock, J.M.; Neill, S.D. **Lymphocyte subtypes in experimentally induced early-stage bovine tuberculous lesions.** *Journal of Comparative Pathology*. 2001. 124 (1) 46-51.

**NAL Call Number:** 41.8 J82

**Descriptors:** lymphocyte subtype identification, bovine tuberculosis, calves, phenotypes, immunohistochemistry, lungs lesions, lymph nodes, T lymphocytes, B lymphocytes, *Mycobacterium*, cattle, pathogenesis.

Caro, M.R.; Gallego, M.C.; Buendia, A.J.; del Rio, L.; Seva, J.; Navarro, J.A. **Differences in lymphocyte subpopulations from peripheral blood and lymphoid organs in natural caprine tuberculosis infection.** *Journal of Veterinary Medicine, Series B*. Mar 2001. 48 (2) 81-88. ISSN: 0931-1793

**NAL Call Number:** 41.8 Z52

**Descriptors:** goats, blood, lymph nodes, infections, tuberculosis, defense mechanisms, *Mycobacterium tuberculosis*, spleen, lesions, cd4+ lymphocytes, cd8 -lymphocytes, B lymphocytes, T lymphocytes, receptors, interleukin 2, rates.

Charleston, B.; Hope, J.C.; Carr, B.V.; Howard, C.J. **Masking of two in vitro immunological assays for *Mycobacterium bovis* (BCG) in calves acutely infected with non-cytopathic bovine viral diarrhoea virus.** *Veterinary Record*. 2001. 149 (16) 481-484. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** calves, BCG vaccination, diagnosis, interferon, lymphocyte transformation, bovine diarrhea virus, *Mycobacterium avium*, *Mycobacterium bovis*, pestivirus, in vitro assays.

Chowdhury, J.; Sarkar, S.; Pal, N.K.; Roy, N.; Chakraborty, M. **Bovine tuberculosis -- a slaughter house based assessment.** *Indian Journal of Animal Health*. 2001. 40 (1) 41-44.

**NAL Call Number:** SF1 I4

**Descriptors:** post-slaughter, cattle, prevalence tuberculosis, epidemiology, lung tissue, *Mycobacterium bovis*, Z-N staining, histological examination by H-E and FFA, test comparison, India, West Bengal.

Coleman, J.D. **Possums as vectors of Tb in livestock.** *Proceedings of the New Zealand Society of Animal Production*. 2001. 61: 57-59. Note: 61st Conference, Lincoln University, New Zealand, 25-27 June 2001.

**NAL Call Number:** 49.9 N483

**Descriptors:** animal pathology, disease transmission, disease vectors, epidemiology, lung lesions, cattle, livestock, lymph nodes, tuberculosis, vector control, wild animals, *Mycobacterium bovis*, *Trichosurus vulpecula*, brushtail possums, New Zealand.

Cousins, D.V. ***Mycobacterium bovis* infection and control in domestic livestock.** *Revue Scientifique et Technique Office International des Epizooties*. 2001. 20 (1) 71-85. Note: In English with French and Spanish summaries.

**NAL Call Number:** SF781 R4

**Descriptors:** *Mycobacterium bovis*, domestic livestock species, disease control and eradication programs, economics, milk pasteurization, tuberculosis.

Cunha, A.P. da; Mota, R.A.; Rabelo, S.S. de A.; Silva, L.B.G. da; Nascimento-Sobrinho, E.S. do; Soares, P.C.; Castro Junior, I.F. de; Bello, A.C.P. de P. **Estudo epidemiológico da infecção pelo *Mycobacterium bovis* em bovinos leiteiros do município de Gravata-PE. [An epidemiological survey of *Mycobacterium bovis* in the municipal district of Gravata, State of Pernambuco, Northeastern Brazil.]** *Ciencia Veterinaria nos Tropicós*. 2001; 4 (2/3): 291-296. ISSN: 1415-6326. Note: In Portuguese with an English summary.

**Descriptors:** different breeds of cattle, *Mycobacterium bovis*, 20 dairy herds, epidemiological surveys, diagnosis, double comparative testing, purified protein derivative—mammalian and avian, 40% of herds showed positive skin reaction, Gravata region, Brazil.

Cvetnic, Z.; Spicic, S. **Rasprostranjenost tuberkuloze svinja u Republici Hrvatskoj u razdoblju od 1990. do 2000. godine. [Expansion of tuberculosis in pigs in the Republic of Croatia in the period 1990-2000.]** *Praxis Veterinaria Zagreb*. 2001. 49 (3) 113-116. Note: In Croatian with an English summary.

**Descriptors:** disease prevalence, disease surveys, epidemiology, seroprevalence, tuberculosis, *Mycobacterium*, pigs, 17 breeding farms, tuberculin test, Croatia.

de Lisle, G.W. **Bovine tuberculosis: a view from down under.** *Veterinary Journal*. May 2001. 161 (3) 220-221. ISSN: 1090-0233

**URL:** <http://intl.elsevierhealth.com/journals/tvj/>

**NAL Call Number:** SF601.V484

**Descriptors:** cattle, *Mycobacterium bovis*, deer, badgers, disease control programs, tuberculosis disease control, UK, New Zealand.

Delahay, R.J.; Cheeseman, C.L.; Clifton-Hadley, R.S.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Wildlife disease reservoirs: the epidemiology of *Mycobacterium bovis* infection in the European badger (*Meles meles*) and other British mammals.** *Tuberculosis*. 2001. 81 (1-2) 43-49. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** animal behavior, disease distribution, disease prevalence, disease transmission, epidemiology, reservoir hosts, wildlife, cats, deer, cattle, foxes, ferrets, badgers, mink, rats, *Rattus norvegicus*, *Talpa europaea*, Great Britain, New Zealand.

Di Falco, A.; Piancone, G.; Balla, S.; Defilippi, A. **Presenza di isoniazide nel latte piemontese. [Isonicotinic acid hydrazide in milk of Piedmont region.]** *Industrie Alimentari*. 2001. 40 (405) 755-758. Note: In Italian with an English summary.

**NAL Call Number:** HD9000.1 I52

**Descriptors:** cattle, cattle farming, drug residues in milk, isoniazid, Italy.

Enticott, G. **Calculating nature: the case of badgers, bovine tuberculosis and cattle.** *Journal of Rural Studies*. Apr 2001. 17 (2) 149-164. ISSN: 0743-0167

**NAL Call Number:** HT401.J68

**Abstract:** The aim of the paper is to examine the governmentalities associated with attempts to manage nature. In particular, it assesses the role that numbers have played in rural governance. Numbers are seen as an important tool of modern government. However, like other aspects of science, their use in governing nature has been contested by other epistemologies. Drawing upon efforts to regulate the spread of bovine tuberculosis in cattle, the paper firstly examines how numbers have been used in this policy debate. Secondly, the paper outlines three epistemologies of nature--nature as numbers, nature as known and ecological nature--which have been employed in contesting government policy. Finally the paper concludes by analysing the interactions of these knowledges of nature and considering the voice of the badger in these constructions of its identity.

**Descriptors:** badgers, dairy cattle, *Mycobacterium tuberculosis*, disease control, disease transmission, Ministries of Agriculture, government policy, rural areas, farmers' attitudes, UK.

Estrada-Chavez, C.; Mancilla, R.; Arriaga-Diaz, C.; Perez-Gonzalez, R.; Diaz-Otero, F. **Determinacion de anticuerpos anti-PPD en hatos lecheros con distintas prevalencias de tuberculosis bovina en Mexico.** [Antibody response to PPD in cattle from herds with different tuberculosis prevalence in Mexico.] *Veterinaria Mexico*. 2001. 32 (3) 207-211. Note: In Spanish with an English summary.

**NAL Call Number:** SF604 V485

**Descriptors:** antibody response to PPD, serum samples, disease eradication, diagnosis, ELISA, epidemiology, herds, immune response, tuberculin, tuberculosis in cattle, *Mycobacterium bovis*, Mexico.

Estrada-Chavez, C.; Pereira-Suarez, A.L.; Meraz, M.A.; Arriaga, C.; Garcia-Carranca, A.; Sanchez-Rodriguez, C.; Mancilla, R. **High-level expression of NRAMP1 in peripheral blood cells and tuberculous granulomas from *Mycobacterium bovis*-infected bovines.** *Infection and Immunity*. Nov 2001. 69 (11) 7165-7168. ISSN: 0019-9567

**NAL Call Number:** QR1.I57

**Abstract:** By Western blotting, we demonstrate high-level expression of NRAMP1 proteins in peripheral blood cells and granulomas of *Mycobacterium bovis*-infected bovines. Immunohistochemistry of granulomatous lesions showed heavily labeled epithelioid macrophages and Langhans cells. These data suggest that *M. bovis* infection enhances NRAMP1 expression and that active tuberculosis can occur despite this response.

**Descriptors:** tubercular lesions, disease impact on NRAMP1 expression, *Mycobacterium bovis*.

Fujikura, T. **Present situation and problems in farm animal production in the Dominican Republic.** *Journal of Veterinary Medicine, Japan*. 2001. 54 (2) 104-111. Note: In Japanese.

**Descriptors:** animal diseases, disease prevalence, tuberculosis, *Mycobacterium*, *Brucella*, brucellosis, cattle, Dominican Republic.

Goodchild, A.V.; Clifton-Hadley, R.S.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Cattle-to-cattle transmission of *Mycobacterium bovis*.** *Tuberculosis*. 2001. 81 (1-2) 23-41. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, disease control and transmission.

Grossklaus, D. **Zoonosenbekämpfung -- Neue Herausforderungen beim gesundheitlichen Verbraucherschutz.** [Zoonoses control -- new challenges in health protection of consumers.] *Berliner und Munchener Tierärztliche Wochenschrift*. 2001. 114 (11-12) 420-427. Note: In German with an English summary.

**NAL Call Number:** 41.8 B45

**Descriptors:** brucellosis, *Brucella*, tuberculosis, *Mycobacterium*, consumer protection, zoonotic diseases, control programs, disease control, surveys, EU regulations, foodborne diseases, latent infections, livestock, monitoring, public health, *Salmonella*, zoonoses, Germany.

Guarino, A.; di Sarno, A.; Palazzo, M.A.; Fusco, G.; Pompei, G.; Vendemia, N.; Fenizia, D. ***Mycobacterium bovis* infection in water buffalo (*Bubalus bubalis*) in Italy.** *Buffalo Journal*. 2001. 17 (3) 417-423.

**Descriptors:** biochemistry, contamination, epidemiology, histopathology, lesions, lymph nodes, oedema, tuberculin, tuberculosis, zoonoses, buffalo, *Bubalus bubalis*, *Mycobacterium bovis*, Campania, Italy.

Hancox, M.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Cattle TB schemes: control or eradication: a critical reappraisal.** *Tuberculosis*. 2001. 81 (1-2) 185-187. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** cattle, disease prevention and control, disease eradication and transmission, epidemiology, *Mycobacterium bovis*, diseases, pathogenesis.

Kazwala, R.R.; Kambarage, D.M.; Daborn, C.J.; Nyange, J.; Jiwa, S.F.H.; Sharp, J.M. **Risk factors associated with the occurrence of bovine tuberculosis in cattle in the southern highlands of Tanzania.** *Veterinary Research Communications*. Dec 2001. 25 (8) 609-614. ISSN: 0165-7380

**NAL Call Number:** SF601.V38

**Descriptors:** cattle, *Mycobacterium bovis* infections, detection, diagnosis, risk factors, incidence, disease prevalence, climatic factors, age differences, male animals, female animals, blood chemistry, breed differences, steers, pregnancy, lactation, geographical variation, Tanzania.

Kim, YongHwan; Al-Haddawi, M.H.; Cho, HoSeong, Kang, SungKwi; Cho, KyoungOh; Park, HyungSeon; Lee, BongJoo; Park, NamYong. **Multiplex PCR for differential diagnosis of *Mycobacterium* species from bovine clinical samples.** *Korean Journal of Veterinary Research*. 2001. 41 (4) 535-542. Note: In Korean with an English summary.

**NAL Call Number:** 41.9 T12

**Descriptors:** multiplex PCR technique, early detection method, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, *Mycobacterium avium*, *Mycobacterium avium* subsp. *paratuberculosis*, clinical samples, field cattle, ITT assay, comparison study, skin tests.

Kita J.; Mazurek, J. **Zagrozenia zdrowotne chorobami odzwierzęcymi przeniesionymi przez zwierzęta lub material pochodzenia zwierzęcego. [Health risks originating in animal diseases acquired directly or via animal products.]** *Przegląd Epidemiologiczny*. 2001. 55 (Suppl. 2) 213-216. Ogólnopolska konferencja naukowa "Nowopojawiające się nawracające i bioterrorystyczne zagrożenia ze strony zakaźnych chorób odzwierzęcych", Warszawa, Polska, 2001. Note: From a conference proceeding published in Polish.

**NAL Call Number:** RA651 P7

**Descriptors:** veterinary regulations, international trade, quarantine, various diseases, Q fever, immunodeficiency, legionnaires disease, Lyme disease, Ebola, influenza and encephalopathies, tuberculosis, *Mycobacterium*, enzootic leukaemia, brucellosis, IBR, paratuberculosis, leptospirosis.

Kohler, H.; Gyra, H.; Zimmer, K.; Dräger, K.G.; Burkert, B.; Lemser, B.; Hausleithner, D.; Cussler, K.; Klawonn, W.; Hess, R.G. **Immune reactions in cattle after immunization with a *Mycobacterium paratuberculosis* vaccine and implications for the diagnosis of *M. paratuberculosis* and *M. bovis* infections.** *Journal of Veterinary Medicine. Series B*. 2001. 48 (3) 185-195.

**NAL Call Number:** 41.8 Z52

**Descriptors:** immune response, antibodies, calves, cattle, cell mediated immunity, diagnosis, humoral immunity, immunization, live vaccines, tuberculin, vaccination, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium bovis*.

Lavender, A.; Mitchell, T.; UK, Department for Environment, Food & Rural Affairs. **Animal Health 2001 – Report of the Chief Veterinary Officer.** 2001. 94 pp. Department of Environment, Food and Rural Affairs (DEFRA), London, UK.

**Descriptors:** animal health, animal welfare, bovine spongiform encephalopathy, consumer protection, control programs, disease control, disease prevention, disease surveys, disease transmission, food safety, foot and mouth disease, government organizations, international trade, livestock monitoring, outbreaks, public health, reports, trade in animals, transport of animals, tuberculosis, zoonoses, cattle, *Mycobacterium tuberculosis*, TSE, UK.

Lilenbaum, W.; Pessolani, M.C.V.; Fonseca, L.S. **The use of Ag85 complex as antigen in ELISA for the diagnosis of bovine tuberculosis in dairy cows in Brazil.** *Journal of Veterinary Medicine, Series B*. Apr 2001. 48 (3) 161-166. ISSN: 0931-1793

**NAL Call Number:** 41.8 Z52

**Descriptors:** dairy cows, antigens, tuberculosis, immunodiagnosis, evaluation, ELISA, performance, antibodies,

infections, *Mycobacterium bovis*, Brazil.

Livingstone, P.G. **Advances in the diagnosis, control and eradication of bovine tuberculosis (*Mycobacterium bovis*) in domestic and wild animals.** 68th General Session of the International Committee, Paris, 22-26 May 2000. *Comprehensive reports on technical items presented to the International Committee or to Regional Commissions, 2000.* Office International des Epizooties; Paris; France 2001. p 103-123. Note: In English, French, Spanish, and Russian.  
**Descriptors:** cattle diseases, control programs, diagnosis and disease control, epidemiology, immunological techniques, tuberculosis, vaccination, wild animals, deer, *Mycobacterium*.

Lofgren, S. **Studies of prevalence, pathology, isolation and characterisation of bovine tuberculosis in Lusaka, Zambia.** *Minor Field Studies. International Office, Swedish University of Agricultural Sciences.* Uppsala; Sweden 2001. No. 152, 28 pp.  
**Descriptors:** characterization, disease prevalence, epidemiology, food hygiene, foodborne diseases, lesions, meat inspection, tuberculosis, zoonoses, *Mycobacterium tuberculosis*, cattle, Zambia.

Magnano, G.; Sorribes, A.; Schneider, M.; Giraudo, J.; Bergamo, E.; Navarro, F. **Tuberculosis bovinal una experiencia de saneamiento en tambo. [Bovine tuberculosis: a sanitary experience in dairy farm.]** *Veterinaria Argentina.* 2001. 18 (180) 732-745. Note: In Spanish with an English summary.  
**NAL Call Number:** SF604 V463  
**Descriptors:** dairy cattle, disease prevalence, prevention and control, epidemiology, *Mycobacterial bovis*, diseases, sanitation, tuberculin skin tests, tuberculosis, Argentina.

Menzies, F.D.; Neill, S.D. **Bovine tuberculosis: controlling cattle-to-cattle transmission.** *Cattle Practice.* 2001. 9 (4) 243-247.  
**NAL Call Number:** SF961 C37  
**Descriptors:** diagnosis, disease control, disease prevention, disease transmission, tuberculosis, cattle, *Mycobacterium bovis*.

Miao, Z.H.; Glatz, P.C.; English, A.; Ru, Y.J. **Managing fallow deer (*Dama dama*) and red deer (*Cervus elaphus*) for animal house research.** *ANZCCART News.* 2001. 14 (4) Insert 1-Insert 8.  
**NAL Call Number:** SF405.5 A3  
**Descriptors:** animal behavior, housing, nutrition, production systems, fallow and red deer farming, *Dama dama*, *Cervus elaphus*, ectoparasites, bacterial diseases, protozoal diseases, viral infection, Australia.

Miciora, R. **Aspecte epidemiologice ale infectiei cu *Mycobacterium bovis* la animale si om. [Epidemiological aspects of *Mycobacterium bovis* infection in animals and man.]** *Revista Romana de Medicina Veterinara.* 2001. 11 (1) 19-32. Note: In Romanian.  
**NAL Call Number:** SF604 R48  
**Descriptors:** badgers, cattle, *Mycobacterium bovis*, zoonotic diseases, disease reservoir, clinical aspects, disease transmission, epidemiology, tuberculosis, reviews.

Monreal, L.; Segura, D.; Segales, J.; Garrido, J.M.; Prades, M. **Diagnosis of *Mycobacterium bovis* infection in a mare.** *Veterinary Record.* Dec 8, 2001. 149 (23) 712-714. ISSN: 0042-4900  
**NAL Call Number:** 41.8 V641  
**Descriptors:** mares, horses, *Mycobacterium bovis*, tuberculosis, diagnosis, polymerase chain reaction, spleen, lesions, case reports.

Neill, S.D.; Bryson, D.G.; Pollock, J.M.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Pathogenesis of tuberculosis in cattle.** *Tuberculosis.* 2001. 81 (1-2) 79-86. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.  
**Descriptors:** disease models, experimental infections, immune response, pathogenesis, cattle tuberculosis, *Mycobacterium*, review.

Nugent, G. **Deer and pigs as hosts of bovine tuberculosis, and their potential use as sentinels of disease presence.** *Proceedings of the New Zealand Society of Animal Production.* 2001. 61: 64-67. Note: 61st conference, Lincoln University, New Zealand, 25-27 June 2001.

**NAL Call Number:** 49.9 N483

**Descriptors:** disease prevalence, hosts, sentinel animals, tuberculosis, wild animals, wild pigs, cattle, *Cervus elaphus*, deer, *Mycobacterium bovis*, pigs, red deer, *Trichosurus vulpecula*, New Zealand.

Omer, M.K.; Skjerve, E.; Woldehiwet, Z.; Holstad, G. **A cross-sectional study of bovine tuberculosis in dairy farms in Asmara, Eritrea.** *Tropical Animal Health and Production*. July 2001. 33 (4) 295-303. ISSN: 0049-4747. Note: In English with a Spanish and French summary.

**NAL Call Number:** SF601.T7

**Descriptors:** dairy cattle, bovine tuberculosis, *Mycobacterium bovis*, dairy farms, disease prevalence, risk factors, diagnosis, mathematical models, dairy breeds, risk assessment, livestock numbers, epidemiology, cattle housing, intradermal tuberculin test, herd survey, prevalence, risk of disease, Eritrea.

Orme, I.M.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Immunology and vaccinology of tuberculosis: can lessons from the mouse be applied to the cow?** *Tuberculosis*. 2001. 81 (1-2) 109-113. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** CD4+ lymphocytes, cows, cattle, mice, disease models, laboratory animals, experimental infections, host resistance, immunity, immunology, interferon, lungs, tuberculosis, vaccine development, vaccines, *Mycobacterium tuberculosis*.

Patel, R.M.; Joshi, C.G.; Solanki, J.V.; Patel, P.R. **PCR based detection of tuberculosis from blood using oligo primers in cattle.** *Indian Veterinary Journal*. 2001. 78 (6) 480-482.

**NAL Call Number:** 41.8 IN2

**Descriptors:** blood, dairy cattle, *Mycobacterium bovis*, diagnosis, diagnostic techniques, DNA, tuberculin test, feces, PCR, India.

Pfeiffer D.U. **TB: current status and control: a view from the outside.** *Cattle Practice*. 2001. 9 (4) 249-255.

**NAL Call Number:** SF961 C37

**Descriptors:** disease control and transmission, epidemiology, reservoir hosts, tuberculosis in cattle, *Mycobacterium bovis*, UK.

Pollock, J.M.; McNair, J.; Welsh, M.D.; Girvin, R.M.; Kennedy, H.E.; Mackie, D.P.; Neill, S.D.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Immune responses in bovine tuberculosis.** *Tuberculosis*. 2001. 81 (1-2) 103-107.

Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** antigens, cell mediated immunity, immune response, macrophages, disease control, *Mycobacterium bovis*, disease models, cattle, experimental infections, T lymphocytes, tuberculosis, macrophages, reviews.

Pollock, J.M.; Buddle, B.M.; Andersen, P.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Towards more accurate diagnosis of bovine tuberculosis using defined antigens.** *Tuberculosis*. 2001. 81 (1-2) 65-69. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, abattoirs, antigens, diagnosis, diagnostic techniques, immune response, reviews.

Quirin, R.; Rasolofo, V.; Andriambololona, R.; Ramboasolo, A.; Rasolonavalona, T.; Raharisolo, C.; Rakotoaritahina, H.; Chanteau, S.; Boisier, P. **Validity of intradermal tuberculin testing for the screening of bovine tuberculosis in Madagascar.** *Onderstepoort Journal of Veterinary Research*. 2001. 68 (3) 231-238.

**NAL Call Number:** 41.8 On1

**Descriptors:** cattle, prevalence survey, intradermal tuberculin test, epidemiology, test validity, sensitivity and specificity, preslaughter, *Mycobacterium bovis*, Madagascar.

Reis, D.O.; de Almeida, L.P.; Pimenta, A.; Vieira, R.L. **Zoonoses reemergentes: um estudo com bovinos abatidos em frigorifico da regio Sudeste do Brasil. [Reemerging zoonoses: a study of cattle slaughtered in the south eastern region of Brazil.]** *Higiene Alimentar*. 2001. 15 (82) 23-26. Note: In Portuguese with an English summary.

**Descriptors:** post-slaughter survey, cattle, 1984-98, 317372, 0.08% positive for tuberculosis, *Mycobacterium*, bursitis, Minas Gerais, Brazil.

Rhodes, S.G.; Hewinson, R.G.; Vordermeier, H.M. **Antigen recognition and immunomodulation by gammadelta T**

**cells in bovine tuberculosis.** *Journal of Immunology*. 2001. 166 (9) 5604-5610.

**NAL Call Number:** 448.8 J8232

**Descriptors:** antigens, experimental infection, in vitro, interferon, lymphocyte transformation, T lymphocytes, cattle tuberculosis, cattle, *Mycobacterium bovis*, gammadelta, T cells, immunomodulation.

Silva, E. **Evaluation of an enzyme-linked immunosorbent assay in the diagnosis of bovine tuberculosis.** *Veterinary Microbiology*. Jan 26, 2001. 78 (2) 111-117. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Descriptors:** cattle, *Mycobacterium bovis*, ELISA, diagnosis, evaluation, lesions, disease prevalence, diagnostic techniques, sensitivity, bovine tuberculosis, histopathology.

Silva, E.; Merlini, J.C.; de Kantor, I.N.; Robinson, A.; Aluffi, L.; Martinez, N.; Moscatelli, J. **Evaluacion de campo del sistema DAVIH TBB en el diagnostico serologico de la tuberculosis bovina en Argentina. [Field evaluation of DAVIH TBB system in the serological diagnosis of bovine tuberculosis in Argentina.]** *Revista de Salud Animal*. 2001. 23 (3) 165-168. Note: In Spanish with an English summary.

**NAL Call Number:** SF1 R484

**Descriptors:** antibodies, diagnosis, diagnostic techniques, disease distribution, disease prevalence, ELISA, epidemiology, immunodiagnosis, skin tuberculin testing, tuberculosis in cattle, *Mycobacterium bovis*, Argentina.

Smith, G.C.; Cheeseman, C.L.; Wilkinson, D.; Clifton Hadley, R.S. **A model of bovine tuberculosis in the badger *Meles meles*: the inclusion of cattle and the use of a live test.** *Journal of Applied Ecology*. June 2001. 38 (3) 520-535. ISSN: 0021-8901

**NAL Call Number:** 410 J828

**Descriptors:** tuberculosis, *Mycobacterium bovis*, cattle, badgers, *Meles meles*, infection, disease control, disease transmission, culling, ELISA, stochastic models, simulation models, population dynamics, epidemiology, vectorial capacity, disease prevalence, England.

Smith, G.C.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Models of *Mycobacterium bovis* in wildlife and cattle.** *Tuberculosis*. 2001. 81 (1-2) 51-64. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** badgers, cattle, deer, Didelphidae, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, disease control, disease models, reviews, simulation models, wild animals, small mammals.

Smith, R.A.; Alvarez, A.J.; Estes, D.M. **The P2X7 purinergic receptor on bovine macrophages mediates mycobacterial death.** *Veterinary Immunology and Immunopathology*. Feb 10, 2001. 78 (3/4) 249-262. ISSN: 0165-2427

**NAL Call Number:** SF757.2.V38

**Abstract:** P2X7 is an ATP gated purinoceptor that has been linked to various immune responses. P2X7 appears to be expressed ubiquitously in the immune system and thus may be important as an effector pathway or play significant roles in cell activation/death. 2',3'-(4-Benzoyl)benzoyl ATP is the most potent agonist of this receptor and ATP in its fully dissociated form (ATP(4-)) also activates the receptor. High concentrations of ATP can cause the P2X7 receptor to induce pore formation on the surface of the cell that allows molecules of considerable size to pass and can lead to cell death. The P2X7 receptor has also been linked to various immune activities when the concentration of ATP is lower, including the release of IL-1beta. The role P2X7 receptors have on immune cell activities is just beginning to be understood. We sought to determine the role of P2X7 on bovine macrophages in eliminating the causative agent of bovine-type tuberculosis, *Mycobacterium bovis*. Because high concentrations of ATP are linked to macrophage death, we determined if this method of cell destruction also leads to reduced bacterial viability. We find that P2X7 is present on bovine macrophages from different sources, including both peripheral blood-derived as well as alveolar macrophages. In addition, P2X7 mRNA is present in B and T lymphocytes. The treatment of *M. bovis*-infected macrophages with ATP results in reduced macrophage viability as well as reduced *M. bovis* viability.

**Descriptors:** cattle, macrophages, *Mycobacterium bovis* BCG strain, receptors, messenger RNA, viability, death, cell growth, ATP, B lymphocytes, T lymphocytes.

Smyth, A.J.; Welsh, M.D.; Girvin, R.M.; Pollock, J.M. **In vitro responsiveness of gamma delta T cells from *Mycobacterium bovis*-infected cattle to mycobacterial antigens: predominant involvement of WC1+ cells.**

*Infection and Immunity*. 2001; 69 (1): 89-96. ISSN: 0019-9567

URL: <http://iai.asm.org/>

NAL Call Number: QR1.I57

**Abstract:** It is generally accepted that protective immunity against tuberculosis is generated through the cell-mediated immune (CMI) system, and a greater understanding of such responses is required if better vaccines and diagnostic tests are to be developed. Gammadelta T cells from a major proportion of the peripheral blood mononuclear cells (PBMC) in the ruminant system and, considering data from other species, may have a significant role in CMI responses in bovine tuberculosis. This study compared the in vitro responses of alphabeta and gammadelta T cells from *Mycobacterium bovis*-infected and uninfected cattle. The results showed that, following 24 h of culture of PBMC with *M. bovis*-derived antigens, the majority of gammadelta T cells from infected animals became highly activated (upregulation of interleukin-2R), while a lower proportion of the alphabeta T-cell population showed activation. Similar responses were evident to a lesser degree in uninfected animals. Study of the kinetics of this response showed that gammadelta T cells remained significantly activated for at least 7 days in culture, while activation of alphabeta T cells declined during that period. Subsequent analysis revealed that the majority of activated gammadelta T cells expressed WC1, a 215-kDa surface molecule which is not expressed on human or murine gammadelta T cells. Furthermore, in comparison with what was found for CD4+ T cells, *M. bovis* antigen was found to induce strong cellular proliferation but relatively little gamma interferon release by purified WC1+ gammadelta T cells. Overall, while the role of these cells in protective immunity remains unclear, their highly activated status in response to *M. bovis* suggests an important role in antimycobacterial immunity, and the ability of gammadelta T cells to influence other immune cell functions remains to be elucidated, particularly in relation to CMI-based diagnostic tests.

**Descriptors:** T lymphocytes, cell mediated immunity, bacterial antigens.

Skinner, M.A.; Wedlock, D.N.; Buddle, B.M. **Vaccination of animals against *Mycobacterium bovis***. *Revue Scientifique et Technique Office International des Epizooties*. 2001. 20 (1) 112-132. Note: In English with French and Spanish summaries.

NAL Call Number: SF781 R4

**Descriptors:** disease control, immune response, immunology, recombinant vaccines, tuberculosis, vaccination, wildlife, cattle, deer, *Mycobacterium bovis*.

Taylor, M.J.; Hughes, M.S.; Skuce, R.A.; Neill, S.D. **Detection of *Mycobacterium bovis* in bovine clinical specimens using real-time fluorescence and fluorescence resonance energy transfer probe rapid-cycle PCR**. *Journal of Clinical Microbiology*. Apr 2001. 39 (4) 1272-1278. ISSN: 0095-1137

NAL Call Number: QR46.J6

**Descriptors:** cattle, tuberculosis, polymerase chain reaction, PCR, lymph nodes.

Thorel, M.F.; Huchzermeyer, H.F.; Michel, A.L. ***Mycobacterium avium* and *Mycobacterium intracellulare* infection in mammals**. *Revue Scientifique et Technique Office International des Epizooties*. 2001. 20 (1) 204-218. Note: In English with French and Spanish summaries.

NAL Call Number: SF781 R4

**Descriptors:** domestic animals, immunosuppression, post slaughter survey, soil microbes, tuberculosis, water, cats, dogs, small mammals, wild animals, wild birds, zoonotic diseases.

Valsson, O.; Alenius, S.; Nielsen, T.K.; Nyberg, O.; Salmela, P.; Elvander, M. (ed.); Lindberg, A. (ed.); Christensen, B. **Surveillance of ruminant diseases in the Nordic countries**. *Acta Veterinaria Scandinavica, Supplementum*. 2001. No. 94 supp. 27-28. *Proceedings of the 13th Nordic Committee for Veterinary Scientific Cooperation (NKVet) Symposium on National Disease Control in Farmed Animals, Stockholm, Sweden, 1-2 October 1999*.

NAL Call Number: 41.8 Ac87 Suppl.

**Descriptors:** animal health; cattle diseases, bovine leucosis, brucellosis, BSE, paratuberculosis, scrapie, tuberculosis, salmonellosis, *Mycobacterium*, prevention and control, surveillance.

Vordermeier, H.M.; Cockle, P.J.; Whelan, A.O.; Rhodes, S.; Chambers, M.A.; Clifford, D.; Huygen, K.; Tascon, R.; Lowrie, D.; Colston, M.J.; Hewinson, R.G. **Effective DNA vaccination of cattle with the mycobacterial antigens MPB83 and MPB70 does not compromise the specificity of the comparative intradermal tuberculin skin test**. *Vaccine*. 2001. 19 (9-10) 1246-1255.

NAL Call Number: QR189 V32

**Descriptors:** bovine tuberculosis, control and prevention, tuberculin test, culling strategy, DNA vaccine development, mycobacterial antigens, MPB70, MPB83, Ag85A, calves, cellular immune responses, CD4+ T cells, effectiveness, cattle, *Mycobacterium bovis*, South West England.

Vordermeier, M.; Aranaz, A.; Pollock, J.M.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Immunodiagnosis of bovine tuberculosis. Summary of a satellite workshop of the *Mycobacterium bovis* 2000 conference, Cambridge, UK, 17 August 2000.** *Tuberculosis*. 2001. 81 (1-2) 177-180. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** *Mycobacterium bovis*, cattle, antigens, concurrent infections, detection, diagnosis, disease control, immunization, immunodiagnosis, immunological techniques, interferon, mycobacterial diseases, serology, tuberculin, tuberculosis, vaccination.

Vordermeier, H.M.; Whelan, A.; Cockle, P.J.; Farrant, L.; Palmer, N.; Hewinson, R.G. **Use of synthetic peptides derived from the antigens ESAT-6 and CFP-10 for differential diagnosis of bovine tuberculosis in cattle.** *Clinical and Diagnostic Laboratory Immunology*. 2001. 8 (3) 571-578; 57.

**Descriptors:** cattle, antigens, BCG vaccine, differential diagnosis, immunization, vaccination, vaccine development, *Mycobacterium bovis*, UK.

Vural, S.A.; Tunca, R. **Generalized tuberculosis in a 45 day-old calf.** *Deutsche Tierärztliche Wochenschrift*. 2001. 108 (11) 468-470. Note: In English with a German summary.

**NAL Call Number:** 41.8 D482

**Descriptors:** bacterial antigens, calves, case reports, histopathology, immunohistochemistry, lesions, liver, lungs, lymph nodes, macrophages, tuberculosis, cattle, *Mycobacterium bovis*.

Whipple, D.L.; Palmer, M.V.; Slaughter, R.E.; Jones, S.L. **Comparison of purified protein derivatives and effect of skin testing on results of a commercial gamma interferon assay for diagnosis of tuberculosis in cattle.** *Journal of Veterinary Diagnostic Investigation*. Mar 2001. 13 (2) 117-122. ISSN: 1040-6387

**NAL Call Number:** SF774 J68

**Descriptors:** cattle, tuberculosis, *Mycobacterium bovis*, interferon assay, skin tests, blood, stimulation, bacterial antigens, bacterial proteins, diagnosis.

Wood, P.R.; Jones, S.L.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **BOVIGAM™: an in vitro cellular diagnostic test for bovine tuberculosis.** *Tuberculosis*. 2001. 81 (1-2) 147-155. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** diagnostic tests and techniques, assays, in vitro testing, alternative to animal testing, BCG vaccine, dexamethasone, diagnosis, drug therapy, *Mycobacterium bovis*, immunization, interferon, parturition, skin tests, T lymphocytes, bovine tuberculosis, vaccination, cattle, reviews.

Zanini, M.S.; Moreira, E.C.; Lopes, M.T.P.; Oliveira, R.S.; Leao, S.C.; Fioravanti, R.L.; Roxo, E.; Zumarraga, M.; Romano, M.I.; Cataldi, A.; Salas, C.E. ***Mycobacterium bovis*: polymerase chain reaction identification in bovine lymphonode biopsies and genotyping in isolates from Southeast Brazil by spoligotyping and restriction fragment length polymorphism.** *Memorias do Instituto Oswaldo Cruz*. 2001. 96 (6) 809-813.

**NAL Call Number:** 448.9 IN74

**Descriptors:** diagnostic techniques, genotypes, lymph nodes, polymerase chain reaction, polymorphism, cattle, *Mycobacterium bovis*.

## 2000

Abernethy, D.A.; Pfeiffer, D.U.; Neill, S.D. **Case control study examining the role of livestock markets in the transmission of bovine tuberculosis.** *Proceedings of a Meeting, Society for Veterinary Epidemiology and Preventive Medicine* [Great Britain]. 2000. p. 108-114. ISSN: 0956-7496. Note: Meeting held on Mar 29-31, 2000, Edinburgh.

**NAL Call Number:** SF780.9.S63

**Descriptors:** cattle, *Mycobacterium bovis*, disease transmission, livestock markets, disease prevention and control, epidemiology, cattle, badgers, UK.

Acosta, B.; Real, F.; Leon, L.; Deniz, S.; Ferrer, O.; Rosario, I.; Ramirez, A. **ELISA for anti-MPB70: an option for**

**the diagnosis of goat tuberculosis caused by *Mycobacterium bovis*.** *Australian Veterinary Journal*. June 2000. 78 (6) 423-424. ISSN: 0005-0423

**NAL Call Number:** 41.8 Au72

**Descriptors:** goats, tuberculosis, *Mycobacterium bovis*, ELISA, skin tests, *Corynebacterium pseudotuberculosis*, *Mycobacterium paratuberculosis*, diagnostic value.

Aldwell, F.E.; Dicker, B.L.; da S. Tatley, F.M.; Cross, M.F.; Liggett, S.; Mackintosh, C.G.; Griffin, J.F.T.

***Mycobacterium bovis*-infected cervine alveolar macrophages secrete lymphoreactive lipid antigens.** *Infection and Immunity*. 2000. 68 (12) 7003-7009.

**NAL Call Number:** QR1.I57

**Abstract:** Tuberculosis is caused by intracellular bacteria belonging to the genus *Mycobacterium*, including *M. tuberculosis* and *M. bovis*. Alveolar macrophages (AMs) are the primary host cell for inhaled mycobacteria. However, little is known about the mechanisms by which infected AMs can process and present mycobacterial antigens to primed lymphocytes and how these responses may affect ensuing protection in the host. In the present study, we sought to determine whether AMs from a naturally susceptible host for *M. bovis* (red deer) could produce and secrete soluble immunoreactive antigens following mycobacterial infection in vitro. Confluent monolayers of deer AMs were infected with either heat-killed or live virulent *M. bovis* or *M. bovis* BCG at a multiplicity of infection of 5:1 and cultured for 48 h. Culture supernatants were collected, concentrated, and tested for the presence of mycobacterial antigens in a lymphocyte proliferation assay by using peripheral blood mononuclear cells from *M. bovis*-sensitized or naive deer. Supernatants derived from macrophages which had been infected with live bacilli stimulated the proliferation of antigen-sensitized, but not naive, lymphocytes. Supernatants derived from uninoculated AMs or AMs inoculated with heat-killed bacilli failed to stimulate lymphocyte proliferation. The lymphoproliferative activity was retained following lipid extraction of the supernatants, which were free of amino groups as determined by thin-layer chromatography. These results demonstrate that mycobacteria which are actively growing within AMs produce lipids which are secreted into the extracellular milieu and that these lipids are recognized by lymphocytes from mycobacterium-primed hosts. We suggest that mycobacterial lipids are released from AMs following aerosol infection in vivo and that they play an important role in the early immune response to tuberculosis.

**Descriptors:** deer, *Mycobacterium bovis*, bacterial antigens, lipid secretions, lymphocyte transformation, lymphocytes, macrophages, lymphoproliferative activity, alveolar macrophages.

Ameni, G.; Miorner, H.; Roger, F.; Tibbo, M. **Comparison between comparative tuberculin and gamma-interferon tests for the diagnosis of bovine tuberculosis in Ethiopia.** *Tropical Animal Health and Production*. Oct 2000. 32 (5) 267-276. ISSN: 0049-4747. Note: Summaries in French and Spanish.

**NAL Call Number:** SF601.T7

**Descriptors:** zebu cattle, tuberculosis, *Mycobacterium bovis*, skin tests, diagnostic value, interferon, tuberculin, delayed type hypersensitivity, blood plasma, false negative results, Ethiopia.

Ameni, G.; Medhin, G. **Effect of gastro-intestinal parasitosis on tuberculin test for the diagnosis of bovine tuberculosis.** *Journal of Applied Animal Research*. 2000. 18 (2) 221-224. Note: In English with a Hindi summary.

**NAL Call Number:** SF55 I4J68

**Descriptors:** gastrointestinal diseases, parasitoses, immune response, tuberculin testing, *Mycobacterium*, bovine tuberculosis, *Fasciola*, *Paramphistomum*, *Schistosoma*, coccidian, flukes, cattle.

Anonymous. **Bovine TB: working towards a long-term solution.** *Veterinary Record*. Feb 19, 2000. 146 (8) 201-202. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, tuberculosis, reports, epidemiology, disease control, UK.

Anonymous. **TB and animal husbandry.** *Veterinary Record*. May 27, 2000. 146 (22) 621. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** tuberculosis, cattle, cattle husbandry, *Mycobacterium bovis*, disease transmission.

Antognoli, M.C.; Hernandez, J.A.; Triantis, J.; Salman, M.D. **The use of One tube Nested (OTN) PCR for the detection of *Mycobacterium bovis* in milk from naturally TB-infected herds: the association between tuberculin test reactions and the presence of *M. bovis* in milk.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society*

for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000. 2000: ld 572.

**Descriptors:** cattle, *Mycobacterium bovis*, PCR, zoonotic infections, Mexico.

Asseged, B.; Lubke-Becker, A.; Lemma, E.; Taddele, K.; Britton, S. **Bovine tuberculosis: a cross sectional and epidemiological study in and around Addis Ababa.** *Bulletin of Animal Health and Production in Africa*. 2000. 48 (2) 71-80. Note: Includes a French summary.

**NAL Call Number:** 41.8 B872

**Descriptors:** tuberculin testing, disease incidence, bovine tuberculosis, cattle, intradermal cervical testing, epidemiology, milk, nasal swabs, *Mycobacterium bovis*, Ethiopia.

Barlow, N.D. **Non-linear transmission and simple models for bovine tuberculosis.** *Journal of Animal Ecology*. 2000. 69 (4) 703-713.

**NAL Call Number:** 410 J826

**Descriptors:** mathematical models, disease transmission, tuberculosis, wild animals, epidemiology, cattle diseases, brushtail possum, *Trichosurus vulpecula*, cattle, *Mycobacterium bovis*, New Zealand.

Barthel, R.; Piedrahita, J.A.; McMurray, D.N.; Payeur, J.; Baca, D.; Guemes, F.S.; Perumaalla, V.S.; Ficht, T.A.; Templeton, J.W.; Adams, L.G. **Pathologic findings and association of *Mycobacterium bovis* infection with the bovine NRAMP1 gene in cattle from herds with naturally occurring tuberculosis.** *American Journal of Veterinary Research*. Sept 2000. 61 (9) 1140-1144. ISSN: 0002-9645

**NAL Call Number:** 41.8 AM3A

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculosis, pathology, genes, disease resistance, susceptibility, genetic regulation, lesions, restriction fragment length polymorphism, RFLP, Texas, Mexico.

Blancou, J; Blancou, J. *Histoire de la surveillance et du controle des maladies animals transmissibles. [History of the monitoring and the control of transmissible animal diseases.]* Office International des Epizooties; Paris; France. 2000. xiv + 366 pp. Note: In French.

**Descriptors:** history, symptoms, lesions, etiology, pathology, epidemiology, preventive measures, treatment, legislative aspects of transmissible animal diseases, sheep pox, foot and mouth disease, anthrax, distemper, glanders, contagious pleuropneumonia, rinderpest, African horse sickness, rabies, tuberculosis, tetanus, cysticercosis, dourine, fascioliasis, mange and scabies, endoparasites, cattle, dogs, goat, horse, sheep, swine, wild animals.

Bourne, J.; Donnelly, C.A.; Cox, D.R.; Gettinby, G.; McInerney, J.P.; Morrison, I.; Woodroffe, R. **Bovine tuberculosis: towards a future control strategy.** *Veterinary Record*. Feb 19, 2000. 146 (8) 207-210. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, tuberculosis, *Mycobacterium bovis*, disease control, research.

Bovine Tuberculosis Conference (4th: 2000: Lansing, Mich.). Michigan. Dept. of Agriculture. Michigan. Dept. of Community Health. Michigan. Dept. of Natural Resources. United States. Dept. of Agriculture. Michigan State University. *Proceedings from the Conference on Bovine Tuberculosis. Lansing, Mich.: Bovine TB Eradication Project*, [2000] 40 p.: ill., maps. Note: "The Bovine TB Eradication Project involves a multi-agency team of experts from: Michigan Department of Agriculture, Michigan Department of Resources, Michigan Department of Community Health, United States Department of Agriculture, Michigan State University".

**NAL Call Number:** SF967.T8.B683 2000

**Descriptors:** tuberculosis in cattle, Michigan, government policy.

Castro-Ramos, M.; Errico, F.; Trelles, A.; Curbelo, R.; Laborde, M. **Mycobacterias aisladas de fuentes hidricas en la cuenca lechera de Uruguay. [Mycobacteria associated with water sources in the milk basin of Uruguay.]** *Veterinaria Montevideo*. 1999/2000; 35(141): 21-23. ISSN: 0376-4362. Note: In Spanish with an English summary.

**Descriptors:** dairy cattle, dairy farming, *Mycobacterium* species, *Mycobacterium bovis*, *Mycobacterium terrae*, *Mycobacterium gastri*, *Mycobacterium triviale*, *Mycobacterium vaccae*, microbial contamination of water, monitoring of drainage water and drinking water, disease prevalence, disease surveys, epidemiological surveys, epidemiology, Uruguay.

Coetsier, C.; Vannuffel, P.; Blondeel, N.; Deneff, J.F.; Cocito, C.; Gala, J.L. **Duplex PCR for differential identification of *Mycobacterium bovis*, *M. avium*, and *M. avium* ssp. *paratuberculosis* in formalin-fixed paraffin-embedded tissues from cattle.** *Journal of Clinical Microbiology*. 2000. 38 (8) 3048-3054.

**NAL Call Number:** QR46.J6

**Descriptors:** cattle, deletions, differential diagnosis, DNA sequencing, genes, identification, nucleotide sequences, open reading frames, paratuberculosis, PCR, polymerase chain reaction, tuberculosis, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium tuberculosis*.

Colby, M.M.; Smith, M.A.; Wineland, N.E. **A survey of brucellosis and tuberculosis surveillance among sheep and goats in the United States.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000; Id 507

**Descriptors:** brucellosis, goats, sheep, *Brucella*, *Mycobacterium*, disease surveillance, USA.

Collins, J.D.; Monaghan, M.; McGill, K.; Kelly, A.; Fitzsimons, T. **A longitudinal study of cattle found positive to the interferon gamma assay for *Mycobacterium bovis* infection.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000; Id 197

**Descriptors:** cattle, interferon gamma assay, diagnosis, *Mycobacterium bovis*, postmortem inspections.

Cvetnic, Z.; Lojkic, M.; Majnaric, D.; Krznaric, M.; Sanja, S.; Vera, K.J. **Tuberkuloza goveda u hrvatskoj s osvrtom na situaciju u Europi i u svijetu. [Bovine tuberculosis in Croatia with regards to the situation in Europe and in the World.]** *Praxis Veterinaria*, Zagreb. 2000. 48 (1-2) 33-39. Note: In Croatian with an English summary.

**Descriptors:** disease control, epidemiology, public health, tuberculosis, zoonoses, cattle, humans, *Mycobacterium bovis*, Croatia.

Das, P.K.; Biswal, D.N.; Misra, R.K. **Infectious diseases of crossbred cattle.** *Dairy Development in Eastern India.* National Dairy Research Institute, Eastern Regional Station, Kalyani, India, 2000. p. 46-52.

**Descriptors:** *Brucella*, *Bacillus anthracis*, anthrax, tuberculosis, *Mycobacterium*, rinderpest, rabies, foot and mouth disease, crossbred progeny crossbreds, cattle, *Clostridium chauvoei*, bluetongue virus, bovine diarrhea virus, India.

Delahay, R.J.; Langton, S.; Smith, G.C.; Clifton-Hadley, R.S.; Cheeseman, C.L. **The spatio-temporal distribution of *Mycobacterium bovis* (bovine tuberculosis) infection in a high-density badger population.** *Journal of Animal Ecology*. 2000. 69 (3) 428-441.

**NAL Call Number:** 410 J826

**Descriptors:** European badger, *Meles meles*, disease reservoir, *Mycobacterium bovis*, cattle, Britain, Ireland, spatio-temporal distribution and variation, epidemiology, ecology, wild population density, disease prevalence, gender differences, persistence.

Duarte, A.L.S.; Goncalves, S.C.; Baldaia, M.J.; Mota, A.P. **Inspeccao sanitaria de bovinos: abates e reprovacoes. [Bovine sanitary inspection: slaughtered animals and condemned stock.]** *Veterinaria Tecnica*. 2000. 10 (4) 18-23. Note: In Portuguese.

**Descriptors:** post slaughter, cattle, disease control, carcass condemnation, quality control of cattle products, bovine mastitis, meat inspection, respiratory diseases, pleuropneumonia, bovine leucosis, tuberculosis, *Mycobacterium*, *Brucella*, brucellosis, clinical aspects, bacterial diseases, endometritis, Portugal.

Emmerzaal, A.; Deleu, S. **Rundertuberculose moeilijk vast te stellen en te bestrijden. {Cattle tuberculosis [caused by *Mycobacterium bovis*] is difficult to detect and to treat.}** *Veehouder en Dierenarts*. 2000. 14 (2) 4-7. Note: In Dutch.

**Descriptors:** cattle, *Mycobacterium bovis*, diseases, diagnosis, cattle diseases.

Fathalla, M.; Hailat, N.; Lafi, S.Q.; Basha, E.A.; Al Sahli, A. **An abattoir survey of gross reproductive abnormalities in the bovine genital tract in Northern Jordan.** *Israel Journal of Veterinary Medicine*. 2000. 55 (3) 83-87.

**NAL Call Number:** 41.8 R25

**Descriptors:** reproductive disorders, cattle, ovarian cysts, ovarian diseases, endometritis, pyometra, uterine diseases, tuberculosis, *Mycobacterium*, hematoma, cows, disease surveys, Jordan.

Gallagher, J. **The bovine tuberculosis dilemma--what do we do next.** *Veterinary Journal*. Sept 2000. 160 (2) 85-86. ISSN: 1090-0233

**URL:** <http://intl.elsevierhealth.com/journals/tvj/>

**NAL Call Number:** SF601.V484

**Descriptors:** cattle, tuberculosis, *Mycobacterium bovis*, disease transmission, disease control.

Gallagher, J.; Clifton-Hadley, R.S. **Tuberculosis in badgers; a review of the disease and its significance for other animals.** *Research in Veterinary Science*. Dec 2000. 69 (3) 203-217. ISSN: 0034-5288

**NAL Call Number:** 41.8 R312

**Descriptors:** *Meles meles*, tuberculosis, *Mycobacterium bovis*, pathology, pathogenesis, immunity diagnosis, excretion, epidemiology, wild animals, domestic animals, disease transmission, control methods, literature reviews.

Giacometti, M.; Wyss, D.; Nicolet, J.; Burnens, A.; Pfyffer, G.E.; Audige, L. **Sind die gehegten Hirsche in der Schweiz frei von Tuberkulose? [Are deer kept [on farms] in Switzerland free from tuberculosis?]** *Forum Kleinwiederkauer Petits Ruminants*. 2000. 48 (5) 8-9 (German), 9-10 (French). Note: In German and French

**Descriptors:** deer farming, animal diseases, *Mycobacterium tuberculosis*, mycobacterial diseases, zoonotic diseases, deer, Switzerland.

Griffin, J.M.; Williams, D.H.; Collins, J.D. **A compartmental model for the within-herd spread of *M. bovis* in Irish cattle herds.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000*. 2000: Id 188

**Descriptors:** cattle, *Mycobacterium bovis*, intradermal tests, transmission within a cattle herd, model, Ireland.

Griffin, J.M.; Quigley, F.; Towey, K.P.; Costello, E.; Hammond, R.F.; McGrath, G.; Sleeman, D.P.; Collins, J.D. **A field trial to assess the impact of badger removal on tuberculosis levels in cattle in four geographical areas in Ireland.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000*. 2000: Id 184

**Descriptors:** badgers, cattle, bovine tuberculosis, *Mycobacterium bovis*, autopsy, control programs, disease surveillance, postmortem inspections, Ireland.

Grover, Sunita; Batish, V.K.; Grover, S.; Verma, R. (ed.); Sharma, N. (ed.); Varma, T.K. (ed.); Bagherwal, R.K. (ed.); Jaiswal, T.N. **Diagnosis of tuberculosis in dairy herds by PCR.** *Advancements in Veterinary Science*. Indian Association for the Advancement of Veterinary Research, Bareilly, India 2000. p. 81-91. Note: Indian Veterinary Congress, Izatnagar, India, 18-19 February 2000.

**Descriptors:** dairy herds, diagnosis of tuberculosis, polymerase chain reaction, PCR, diagnostic techniques, *Mycobacterium bovis*, *Mycobacterium tuberculosis*.

Haagsma, J. **Bovine tuberculosis.** *Manual of Standards for Diagnostic Tests and Vaccines. List A and B Diseases of Mammals, Birds and Bees*. 2000. Ed. 4, 359-370. Office International des Epizooties, Paris, France.

**NAL Call Number:** SF771 M36 2000

**Descriptors:** clinical aspects, *Mycobacterium bovis*, bacteriology, clinical aspects, diagnostic techniques, immunization, lesions, postmortem examinations, tuberculin tests, tuberculosis vaccination, vaccine development.

Hadjiev, G. **Kratak prikaz epizootioloske situacije u zivinarstvu Republike Bugarske. [Epidemiology of poultry in Bulgaria.]** *Zivinarstvo*. 2000. 35 (8-9) 161. Note: In Serbian.

**Descriptors:** *Salmonella*, Marek's disease, tuberculosis, *Mycobacterium*, Newcastle disease virus, infectious diseases, epidemiology, poultry, Balkans.

Hammond, R.F. **Visualisation of the temporal and spatial patterns of tuberculin reactor disclosure in an area affected by the removal of badgers.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000*. 2000: Id 183

**Descriptors:** cattle, badgers (*Meles meles*), wild animal disease reservoir, *Mycobacterium bovis*, disease control programs, postmortem inspections, Ireland.

Hancox, M. **Cattle tuberculosis schemes: control or eradication.** *Letters in Applied Microbiology*. July 2000. 31 (1) 87-93. ISSN: 0266-8254

**NAL Call Number:** QR1.L47

**Descriptors:** *Mycobacterium bovis*, disease prevention, eradication, control, plans.

Jorge, M.C.; Schettino, D.M.; Torres, P.; Bernardelli, A. **Primera descripcion de infeccion concomitante de tuberculosis y paratuberculosis en ovinos lecheros en Argentina.** [First description of concomitant infection with tuberculosis and paratuberculosis in dairy sheep in Argentina.] *Revue Scientifique et Technique, Office International des Epizooties*. 2000. 19 (3) 800-809. Note: In Spanish with English and French summaries.

**NAL Call Number:** SF781 R4

**Descriptors:** tuberculosis, mixed infections, diagnosis, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium bovis*, comparative intradermal tuberculin test, dairy sheep, differential diagnosis, paratuberculosis, Argentina.

Kaneene, J.B.; Fitzgerald, S.D.; Schmitt, S.; Miller, R.A.; Bruning-Fann, C.; O' Brien, D.; Judge, L. **Epidemiological studies of *Mycobacterium bovis* in wildlife and domestic livestock, Michigan, USA.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August-6-11, 2000*. 2000: Id 580.

**Descriptors:** cattle, goats, deer, *Mycobacterium bovis*, epidemiology, transmission of disease between domestic livestock and wild deer, Michigan, USA.

Kazwala, R.R.; Sharp, M.; Shirima, G.M.; Mfinanga, G.; Clevealand, S.; Ernest, E.M.; Buza, J.; Kambarage, D.M. **The prevalence of bovine tuberculosis in Rift Valley Districts based on single intradermal comparative tuberculin testing.** *Tanzanian Veterinary Journal*. 2000; 20: 136-140. ISSN: 0856-1451

**Descriptors:** 11,274 cattle, 605 herds, Single Intradermal Comparative Tuberculin Testing (SICTT), prevalence of disease 0.93%, herd prevalence of 14%, control of disease at herd level, Rift Valley Districts, Tanzania.

Kohler, H.; Martin, G.; Schimmel, D. **Immunologische Methoden zur Diagnostik der Rindertuberkulose -- aktueller Stand.** [Immunological methods for the diagnosis of bovine tuberculosis -- state of the art.] *Berliner und Munchener Tierarztliche Wochenschrift*. 2000. 113 (10) 388-391. Note: In German with an English summary.

**NAL Call Number:** 41.8 B45

**Descriptors:** diagnosis, *Mybacterium bovis*, tuberculosis, cattle diseases, skin tests, interferon, lymphocyte transformation.

Lauzi, S.; Pasotto, D.; Amadori, M.; Archetti, I.L.; Poli, G.; Bonizzi, L. **Evaluation of the specificity of the gamma-interferon test in Italian bovine tuberculosis-free herds.** *Veterinary Journal*. July 2000. 160 (1) 17-24. ISSN: 1090-0233

**URL:** <http://intl.elsevierhealth.com/journals/tvj/>

**NAL Call Number:** SF601.V484

**Descriptors:** cattle, tuberculosis, interferon, diagnostic techniques, diagnostic value, *Mycobacterium*, Lombardy.

Leite, R.C.; Bressan, M. (ed.); Martins, C.E. (ed.); Vilela, D. **Danos a producao de ruminante por doencas infecto-contagiosas reprodutivas.** [Damage to ruminant production by reproductive infectious diseases. EMBRAPA, Gado de Leite; Juiz de Fora; Brazil; 2000. p. 137-146. Note: *Simposio Sobre Sustentabilidade da Pecuaria de Leite no Brasil, 2000, Goiania, Brazil*. In Portuguese.

**NAL Call Number:** SF233 B6S87 2000

**Descriptors:** cattle diseases, diagnosis, brucellosis, trichomoniasis, leptospirosis, bovine tuberculosis, *Mycobacterium*, leucosis, disease effects on reproduction, infectious diseases, campylobacteriosis, bacterial diseases, viral diseases.

Liebana, E.; Aranaz, A.; Aldwell, F.E.; McNair, J.; Neill, S.D.; Smyth, A.J.; Pollock, J.M. **Cellular interactions in bovine tuberculosis: release of active mycobacteria from infected macrophages by antigen-stimulated T cells.** *Immunology*. 2000. 99 (1) 23-29.

**NAL Call Number:** 448.3 IM6

**Descriptors:** cattle, *Mycobacterium bovis* infected macrophages invitro interaction with T lymphocytes, tuberculosis, immune response, lymphocytes, antigen stimulated peripheral blood mononuclear cells (PBMC) from infected cattle, uracil uptake.

Lightbody, K.A.; McNair, J.; Neill, S.D.; Pollock, J.M. **IgG isotype antibody responses to epitopes of the *Mycobacterium bovis* protein MPB70 in immunised and in tuberculin skin test-reactor cattle.** *Veterinary Microbiology*. 2000. 75 (2) 177-188.

**NAL Call Number:** SF601 V44

**Descriptors:** cattle, tuberculosis, *Mycobacterium bovis* protein MPB70, B-cell target, epitope level response, IgG1 responses, skin testing, tuberculin, immune response.

Lilenbaum, W. **Atualizacao em tuberculose bovina. [Bovine tuberculosis in Brazil: a minireview.]** *Revista Brasileira de Medicina Veterinaria*. 2000. 22 (4) 145-151. Note: In Portuguese with an English summary.

**NAL Call Number:** SF604 R38

**Descriptors:** reviews, tuberculosis, *Mycobacterium bovis*, disease control, Brazil.

Mackintosh, C.G.; Qureshi, T.; Waldrup, K.; Labes, R.E.; Dodds, K.G.; Griffin, J.F.T. **Genetic resistance to experimental infection with *Mycobacterium bovis* in red deer (*Cervus elaphus*).** *Infection and Immunity*. 2000. 68 (3) 1620-1625.

**NAL Call Number:** QR1.I57

**Abstract:** In a 3-year heritability study, 6 farmed red deer stags were selected from 39 on the basis of their differing responses to experimental challenge via the tonsillar sac with approximately 500 colony forming units of *M. bovis*. Two stags remained uninfected, 2 were moderately affected and 2 developed serious spreading tuberculosis (Tb). 70 offspring, bred from these 6 stags by artificial insemination using stored semen, were similarly challenged with *M. bovis*. The offspring showed patterns of response to *M. bovis* challenge similar to those of their sires, providing evidence for a strong genetic basis to resistance to Tb, with an estimated heritability of 0.48 (standard error, 0.096;  $P < 0.01$ ). This is the first time the heritability of Tb resistance in domestic livestock has been measured. The breeding of selection lines of resistant and susceptible deer will provide an ideal model to study the mechanisms of Tb resistance in a ruminant and could provide an additional strategy for reducing the number and severity of outbreaks of Tb in farmed deer herds. Laboratory studies to identify genetic and immunological markers for resistance to Tb are under way. Preliminary studies showed no associations between NRAMP or DRB genes and resistance to Tb in deer. Patterns of immune responses seen in resistant animals suggest that both innate and acquired pathways of immunity are necessary to produce the resistant phenotype.

**Descriptors:** disease resistance, heritability, resistance to tuberculosis, bacterial diseases, *Mycobacterium bovis*, farmed red deer, *Cervus elaphus*, immune responses, selective breeding.

McKenzie, J.S.; Pfeiffer, D.U.; Morris, R.S. **Spatial and temporal patterns of vector-borne tuberculosis infection in beef breeding cattle in New Zealand.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: 1d 574.

**Descriptors:** beef cattle, *Mycobacterium bovis*, brushtailed possum, *Trichosurus vulpecula*, New Zealand.

McKenzie, J.S.; Pfeiffer, D.U.; Morris, R.S. **Application of habitat analysis and spatial analytical techniques to statistical modelling of possum-associated tb risk on farms.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11 2000.* 2000: 1d 575.

**Descriptors:** cattle, *Mycobacterium bovis*, brushtailed possums (*Trichosurus vulpecula*) habitat analysis, spatial analytical methods, GIS, New Zealand.

Manisha, Mathur; Hemant, Dadhich; Sharma, G.D.; Mathur, M; Dadhich, H. **Histopathological observations on tuberculosis in kidneys of sheep.** *Indian Journal of Veterinary Pathology*. 2000. 24 (2) 117-118.

**NAL Call Number:** SF769 A1I48

**Descriptors:** histopathology, kidneys, tuberculosis, *Mycobacterium tuberculosis*, sheep, Rajasthan, India.

Martin, S.W.; O'-Keeffe, J.; White, P.; Collins, J.D.; Edge, V.L. **Risk factors for tuberculosis in Irish cattle: the analysis of secondary data.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: 1d 240

**Descriptors:** cattle, bacterioses, bovine-tuberculosis, *Mycobacterium bovis*, lung disease, data banks, Eire, Irish Republic.

Mendez y Cazarin, M.D.; Tzintzun Rasco, R.; Val-Arreola, D. **Evaluacion productiva, de efecto ambiental y de problemas relevantes en explotaciones lecheras de pequena escala.** [Production evaluation, environmental effect and problems in small scale dairy farms.] *Livestock Research for Rural Development*. 2000. 12 (1) 1-10. Note: In Spanish with an English summary.

**NAL Call Number:** SF55 D44L582

**Descriptors:** small scale dairy farms, production problems, SILFIRA computerized program, water quality, tuberculosis and brucellosis prevalence, contaminants, milk production, fecal contamination, Mexico.

Menzies, F.D.; Neill, S.D. **Cattle-to-cattle transmission of bovine tuberculosis.** *Veterinary Journal*. Sept 2000. 160 (2) 92-106. ISSN: 1090-0233

**URL:** <http://intl.elsevierhealth.com/journals/tvj/>

**NAL Call Number:** SF601.V484

**Abstract:** In developed countries, *Mycobacterium bovis* infection in cattle is now mostly confined to the respiratory system, which reflects transmission and establishment of infection mainly by this route. A single bacillus transported within a droplet nucleus is probably sufficient to establish infection within the bovine lung. Infected cattle should always be considered as potential sources of infection, since studies have demonstrated that a significant proportion of tuberculous cattle excrete *M. bovis*. In general, the dynamics of *M. bovis* transmission are poorly understood and the conditions under which a tuberculous animal becomes an effective disseminator of infection are currently not defined although environmental contamination appears to be a less effective method of disease transmission. Field studies indicate a wide spectrum of transmission rates but generally the spread of *M. bovis* infection is still considered to be a relatively slow process. Slaughter of diseased cattle detected by tuberculin testing and at meat plant inspection has been shown to be an effective policy for tuberculosis eradication, provided there are no other reservoirs of infection and all involved in the cattle industry are committed to a policy of eradication. Epidemiological approaches, particularly case-control studies, seem to provide the best method for quantifying the relative importance of the various sources of *M. bovis* transmission to cattle and modelling techniques can be used to assist in the design of cost-effective control measures that may lead to tuberculosis eradication.

**Descriptors:** cattle, disease transmission, tuberculosis, *Mycobacterium bovis* spread, disease control, literature reviews.

Milian-Suazo, F.; Salman, M.D.; Ramirez, C.; Payeur, J.B.; Rhyan, J.C.; Santillan, M. **Identification of tuberculosis in cattle slaughtered in Mexico.** *American Journal of Veterinary Research*. Jan 2000. 61 (1) 86-89. ISSN: 0002-9645

**NAL Call Number:** 41.8 AM3A

**Descriptors:** dairy cattle, tuberculosis, *Mycobacterium tuberculosis*, carcasses, identification, meat inspection, geographical distribution, organs, lesions, disease prevalence, Mexico.

Milian-Suazo, F.; Salman, M.D.; Black, W.C.; Triantis, J.M.; Ramirez, C.; Payeur, J.B.; Torres, M.C. **Molecular epidemiologic analysis of *Mycobacterium bovis* isolates from Mexico.** *American Journal of Veterinary Research*. 2000. 61 (1) 90-95. ISSN: 0002-9645

**NAL Call Number:** 41.8 AM3A

**Abstract:** *M. bovis* was isolated from various organs of 400 cattle slaughtered in 6 regions of Mexico and phylogenetic relationships among isolates were assessed using random amplified polymorphic DNA polymerase chain reaction (RAPD-PCR) fingerprinting. Most cattle were adult Holsteins from large herds that did not participate in a tuberculosis control programme. Four random primers and 2 selected primers were used in RAPD-PCR fingerprinting of 88 isolates. Pairwise genetic distance between isolates was obtained and subjected to cluster analysis with bootstrapping to test for levels of support. 98 different fragments were obtained; there was broad genetic diversity among isolates, and each isolate had a unique RAPD-genotype, including those originating from the same herd. Clustering by geographic location, affected organ or severity of lesion was not detected. Linkage disequilibrium analysis suggested that *M. bovis* was highly clonal and that mutations develop at a rapid rate among isolates. Use of RAPD-PCR could not differentiate *M. bovis* isolates by epidemiological characteristics or identify common sources of infection.

**Descriptors:** post slaughter survey, *Mycobacterium bovis*, cattle, isolate genetics, RAPD-PCR, control programs, genetic distance, Mexico.

Monies, R.J. **Tuberculous pneumonia and BVD in housed calves.** *Cattle Practice*. 2000. 8 (2) 119-125.

**NAL Call Number:** SF961 C37

**Descriptors:** case reports, tuberculosis pneumonia, *Mycobacterium*, calves, cattle housing, immunosuppressive agents, histology, serology, diarrhea virus, UK.

Morrison, W.I.; Bourne, F.J.; Cox, D.R.; Donnelly, C.A.; Gettinby, G.; McInerney, J.P.; Woodroffe, R. **Pathogenesis and diagnosis of infections with *Mycobacterium bovis* in cattle.** *Veterinary Record*. Feb 26, 2000. 146 (9) 236-242. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculosis, pathogenesis, disease transmission, diagnosis, diagnostic techniques, disease control, British Isles.

Munroe, F.A.; Dohoo, I.R.; McNab, W.B. **Estimates of within-herd incidence rates of *Mycobacterium bovis* in Canadian cattle and cervids between 1985 and 1994.** *Preventive Veterinary Medicine*. 2000. 45 (3-4) 247-256.

**NAL Call Number:** SF601 P7

**Descriptors:** beef and dairy cattle, deer, cervids, *Mycobacterium bovis*, within-herd incidence of disease, disease transmission, risk factors, tuberculosis, outbreaks, herds, bacterial diseases.

Neill, S.D.; Pollock, J.M. **Testing for bovine tuberculosis--more than skin deep.** *Veterinary Journal*. July 2000. 160 (1) 3-5. ISSN: 1090-0233

**URL:** <http://intl.elsevierhealth.com/journals/tvj/>

**NAL Call Number:** SF601.V484

**Descriptors:** cattle tuberculosis, skin tests, interferon, diagnostic techniques, *Mycobacterium*.

Neil, S.D.; Wedlock D.; Vesosky, B.; Skinner, M.A.; de Lisle, G.W.; Orme, I.M.; Buddle, B.M.; **Vaccination of cattle with *Mycobacterium bovis* culture filtrate proteins and interleukin-2 for protection against bovine tuberculosis.** *Infection and Immunity*. 2000. 68 (10) 5809-5815.

**NAL Call Number:** QR1.I57

**Abstract:** In this study vaccines prepared from culture filtrate proteins (CFP) of *Mycobacterium bovis* and interleukin-2 (IL-2) were tested in cattle for their capacity to stimulate immune responses and to protect against an intratracheal challenge with virulent *M. bovis*. Nine groups of cattle were vaccinated with combinations of different doses of CFP and bovine IL-2 mixed with a monophosphoryl lipid A (MPL) adjuvant. An additional group was vaccinated with *M. bovis* BCG. Immune responses in CFP-IL-2-vaccinated animals differed from those seen in BCG-vaccinated animals by inducing high antigen-specific antibody responses and low levels of gamma interferon and IL-2 released from purified protein derivative-stimulated whole-blood cultures. In a concurrent experiment, additional animals were added to the high-dose CFP-IL-2, MPL control, and BCG groups and these expanded groups of animals were challenged intratracheally with virulent *M. bovis*. Although the lung lesion scores were significantly lower for both the CFP-IL-2- and BCG-vaccinated groups compared to the MPL control group, the overall level of protection was greatest for the BCG-vaccinated animals. There were more animals with extrathoracic spread of disease in the CFP-IL-2 group than in the other groups. While vaccination of cattle with *M. bovis* CFP gave an encouraging reduction in tuberculous lesions and did not induced a delayed-type hypersensitivity response to PPD, future CFP vaccines must prevent any extrathoracic spread of disease.

**Descriptors:** adjuvants, immunization, immune response, interferon, interleukin 2, tuberculosis, vaccination, vaccines, cattle, *Mycobacterium bovis*.

Norden, D.K.; Meyer, R.M.; Salman, M.D. **Evaluation of tuberculin tests in U.S. captive reindeer (*Rangifer tarandus*)-1991-1999.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000*. 2000: Id 394.

**Descriptors:** captive reindeer, tuberculin testing for *Mycobacterium*, USA.

Nott, S.B.; Wolf, C. **Dairy farm decisions on how to proceed in the face of TB.** *Staff Paper Department of Agricultural Economics, Michigan State University*. 2000. No. 2000-39, 18 pp.

**NAL Call Number:** HD1401 S46

**Descriptors:** economic impacts, costs, dairy cattle, on farm decisions, *Mycobacterium*, disease control, depopulation of TB positive animals, economic analysis, tuberculosis, Michigan.

Ocepek, M.; Zdovc, I.; Cestnik, V. (ed.); Pogacnik, A. **Rhodococcus equi kot vzrok granulomatoznih sprememb v bezgavkah prasicev, sumljivih na okuzbo z mikobakterijami. [Rhodococcus equi as a cause of granulomatous changes in lymph nodes of pigs with suspected avian tuberculosis.]** *Veterinarske Novice*. 2000. 26 (Suppl. 1) 35-37.

Note: 6 Konferenca Slovenske Veterinarske Zveze, 24-25 November 2000, Brdo pri Kranju, Slovenia. In Slovenian with an English summary.

**Descriptors:** tissues, mesenteric and mandibular lymph nodes, pigs, granulomatous lymphadenitis, histological examination, culture for tuberculosis, ACCUPROBE (Gen Probe), *Mycobacterium avium* complex, *Rhodococcus equi* colonies, *Api Coryne*, polymerase chain reaction for 16S rRNA, dual infections, Slovenia.

Pavlik, I.; Ayele, W.Y.; Dvorska, L.; Matlova, L.; Oktabcova, L.; Palecek, K.; Svec, V.; Konopa, M.; Docekal, J.; Vraj, L. **Mykobakterialni infekce prasat v Ceske republice v letech 1989-1999.** [Mycobacterial infections of swine in the Czech Republic in 1989-1999.] *Veterinarstvi*. 2000. 50 (5) 194-198. Note: In Czech with an English summary.

**NAL Call Number:** 41.8 V6439

**Descriptors:** meat inspection, diagnosis, disease prevalence, tuberculosis, pigs, *Mycobacterium avium*, *Mycobacterium intracellulare*, *Rhodococcus equi*, Czech Republic.

Pinheiro, S.R. **Controle da tuberculose bovina versus tratamento.** [Control vs. treatment of bovine tuberculosis cattle.] *O Biologico*. 2000. 62 (2) 157-160. Note: In Portuguese with an English summary.

**Descriptors:** bovine tuberculosis, diagnostic tests, treatment concerns, disease control, costs, implications to human health, Brazil.

Pollock, J.M.; Girvin, R.M.; Lightbody, K.A.; Clements, R.A.; Neill, S.D.; Buddle, B.M.; Andersen, P. **Assessment of defined antigens for the diagnosis of bovine tuberculosis in skin test-reactor cattle.** *Veterinary Record*. June 3, 2000. 146 (23) 659-665. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle tuberculosis, *Mycobacterium bovis*, antigens, interferon, diagnostic value, skin tests, derivatives, diagnosis, purified protein derivative.

Reis, D.O.; Alves, F.; Coelho, H.E. **Importancia do exame histopatologico para o diagnostico pos-morte de bovinos abatidos em frigorifico de Uberlandia, MG, 1987-1997.** [Importance of the histopathological examination for the postmortem diagnosis of cold-stored cattle slaughtered at Uberlandia, MG, 1987-1997.] *Higiene Alimentar*. 2000. 14 (78-79) 23-27. Note: In Portuguese with an English summary.

**Descriptors:** cattle, 128 postmortem examinations, check on accuracy of diagnosis, *Mycobacterium*, tuberculosis, neoplasms, Brazil.

Rhodes, S.G.; Gavier-Widen, D.; Buddle, B.M.; Whelan, A.O.; Singh, M.; Hewinson, R.G.; Vordermeier, H.M. **Antigen specificity in experimental bovine tuberculosis.** *Infection and Immunity*. May 2000. 68 (5) 2573-2578. ISSN: 0019-9567

**NAL Call Number:** QR1.I57

**Abstract:** This report describes the kinetics of T-cell responses to a panel of mycobacterial antigens (PPD-M, PPD-A, ESAT-6, Ag85, 38kD, MPB64, MPB70, MPB83, hsp16.1, hsp65, and hsp70) following experimental infection of cattle with *Mycobacterium bovis*. Increased antigen-specific lymphocyte proliferation, gamma interferon, and interleukin-2 responses were observed in all calves following infection. Positive lymphocyte proliferation and cytokine responses to PPD-M and ESAT-6 were observed throughout the infection period studied. In contrast, responses to all other antigens were more variable and were not constantly present, suggesting that antigen cocktails rather than individual antigens should be used for immunodiagnosis. The detection of cytokine responses in the absence of lymphocyte proliferation, particularly during the early stages of infection, suggests a role for antigen-specific cytokine readout systems in the early identification of *M. bovis* infection in cattle.

**Descriptors:** cattle, bacterial antigens, T lymphocytes, lymphocyte transformation, tuberculosis, antigens, cytokines, experimental-infection, immunodiagnosis, interferon, interleukin-2, *Mycobacterium bovis*.

Rhodes, S.G.; Palmer, N.; Graham, S.P.; Bianco, A.E.; Hewinson, R.G.; Vordermeier, H.M. **Distinct response kinetics of gamma interferon and interleukin-4 in bovine tuberculosis.** *Infection and Immunity*. Sept 2000. 68 (9) 5393-5400. ISSN: 0019-9567

**NAL Call Number:** QR1.I57

**Descriptors:** immune responses, gamma interferon, interleukin, cattle, tuberculosis, *Mycobacterium*.

Rojas, H.; Soto, A.; Oltra, O.; Salgado, M.; Badilla, J.; Urcelay, S. **A framework for local livestock services with**

**official disease control programmes: the case of brucellosis and tuberculosis in Chile.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 592.

**Descriptors:** livestock, *Brucella*, *Mycobacterium*, pathogenic bacteria, control programs, Chile.

Rojas, H.; Belaer, J.; Urcelay, S. **Prevalence and herd-level risk factors of bovine brucellosis and tuberculosis in family dairy systems in central Chile.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 591.

**Descriptors:** dairy cattle diseases, herd disease levels and risk factors, disease surveys, *Brucella*, *Mycobacterium*, Chile.

Roring, S.; Hughes, M.S.; Skuce, R.A.; Neill, S.D. **Simultaneous detection and strain differentiation of *Mycobacterium bovis* directly from bovine tissue specimens by spoligotyping.** *Veterinary Microbiology.* 2000. 74 (3) 227-236.

**NAL Call Number:** SF601 V44

**Descriptors:** *Mycobacterium bovis*, bovine tuberculosis, rapid detection and strain typing, lesioned bovine lymph node specimens, PCR, spoligotyping, decontaminated and non-decontaminated lesioned lymph nodes, DNA, cattle.

Ryan, T.J.; Buddle, B.M.; de Lisle, G.W. **An evaluation of the gamma interferon test for detecting bovine tuberculosis in cattle 8 to 28 days after tuberculin skin testing.** *Research in Veterinary Science.* Aug 2000. 69 (1) 57-61. ISSN: 0034-5288

**NAL Call Number:** 41.8 R312

**Descriptors:** cattle tuberculosis, *Mycobacterium bovis*, interferon, diagnostic techniques, accuracy, tuberculin, skin tests.

Ryan, T.J.; Lisle, G.W. de; Buddle, B.M.; Livingstone, P.G. **Cattle tuberculosis: an evaluation of the gamma interferon assay in ancillary serial and parallel testing.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 79.

**Descriptors:** cattle, *Mycobacterium bovis*, serological diagnosis, gamma interferon assay, New Zealand.

Ryan, T.; Livingstone, P. **Risk analysis: movement of cattle from tuberculosis infected herds.** *Surveillance.* 2000. 27 (1) 8-10.

**NAL Call Number:** SF604.63 N45S87

**Descriptors:** *Mycobacterium*, cattle, tuberculosis, diagnosis, disease control, transmission factors, New Zealand.

Salamon, H.; Kato-Maeda, M.; Small, P.M.; Drenkow, J.; Gingeras, T.R. **Detection of deleted genomic DNA using a semiautomated computational analysis of GeneChip data.** *Genome Research.* 2000. 10 (12) 2044-2054.

**NAL Call Number:** QP606 D46P34

**Descriptors:** *Mycobacterium*, genome analysis, genetic polymorphism, deletions, data analysis, DNA hybridization, algorithms.

Sanderson, M.W.; Dargatz, D.A.; Garry, F.B. **Biosecurity practices of beef cow-calf producers.** *Journal of the American Veterinary Medical Association.* 2000. 217 (2) 185-189. ISSN: 0003-1488

**NAL Call Number:** 41.8 AM3

**Descriptors:** security concerns, management practices, testing imported cattle, brucellosis, *Mycobacterium paratuberculosis*, bovine viral diarrhoea, tuberculosis, potential for feed contamination, questionnaires, quarantine practices, vaccine programs, veterinarians as educators.

Sauter-Louis, C.M.; Morris, R.S.; Wilson, P.R.; Pfeiffer, D.U.; Carter, C.; Rhodes, T. **Intervention studies to assess the efficiency of on-farm control programs against tuberculosis in New Zealand.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 247

**Descriptors:** cattle, disease control programs, pasturing, efficiency, *Mycobacterium bovis*, New Zealand.

Sauter-Louis, C.M.; Morris, R.S.; Wilson, P.R.; Pfeiffer, D.U. **The development of motivational incentives for farmers to achieve tuberculosis control in New Zealand.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 246.  
**Descriptors:** cattle tuberculosis, *Mycobacterium bovis*, control programs, New Zealand.

Scacchia, M.; Lelli, R.; Petrini, A.; Prencipe, V.; Calistri, P.; Giovannini, A. **Use of innovative methods in the eradication of bovine tuberculosis.** *Journal of Veterinary Medicine, Series B.* June 2000. 47 (5) 321-327. ISSN: 0931-1793

**NAL Call Number:** 41.8 Z52

**Descriptors:** cattle, *Mycobacterium*, tuberculosis, disease prevention, strains, frequency, detection, skin tests, diagnosis, false positive results, herds, infections, growth, interferon, diagnostic techniques, infected herd screening.

Seva, J.; Hernandez, D.; Bernabe, A.; Pallares, F.J.; Navarro, J.A. **Immunophenotypical characterization of the lymphocyte infiltrate in caprine pulmonary tuberculosis.** *Journal of Comparative Pathology.* Aug/Oct 2000. 123 (2/3) 96-103. ISSN: 0021-9975

**NAL Call Number:** 41.8 J82

**Descriptors:** goats, tuberculosis, T lymphocytes, B lymphocytes, characterization, *Mycobacterium*, phenotypes, disease course, lesions, lungs, lymph nodes.

Shah, D.H.; Rishendra-Verma. **Tuberculosis in sheep and goat: an update.** *Intas Polivet.* 2000; 1(2): 185-189. ISSN: 0972-1738

**Descriptors:** goats, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, susceptibility to disease, clinical aspects, differential diagnosis, disease control, disease transmission, India.

Singh, B.P.; Chauhan, R.S. **Common diseases of the calves and their prevention.** *Pashudhan.* 2000. 15 (7) 1.

**NAL Call Number:** SF604 P27

**Descriptors:** calves, disease prevention, diarrhea, pneumonia, joint diseases, diphtheria, encephalitis, tuberculosis, disease control, *Theileria annulata*, *Mycobacterium bovis*, cattle.

Sreevatsan, S.; Bookout, J.B.; Ringpis, F.; Perumaalla, V.S.; Ficht, T.A.; Adams, L.G.; Hagius, S.D.; Elzer, P.H.; Bricker, B.J.; Kumar, G.K.; Rajasekhar, M.; Isloor, S.; Barathur, R.R. **A multiplex approach to molecular detection of *Brucella abortus* and/or *Mycobacterium bovis* infection in cattle.** *Journal of Clinical Microbiology.* July 2000. 38 (7) 2602-2610. ISSN: 0095-1137

**NAL Call Number:** QR46.J6

**Descriptors:** polymerase chain reaction, milk secretions, *Brucella abortus*, *Mycobacterium bovis*, tuberculosis, diagnosis, nasal secretions.

Tabosa, I.M.; Trindade, V.M.; Vale, G.M.G.; de Medeiros-Dantas, A.F.; Vieira, J.M.; de Medeiros, M.B.A.; de Azevedo, E.O.; de Melo, M.A.; Andrade, M.G.; de Souza, S.B.; da Silva-Medeiros, L.; Rodrigues, R.D.; Xavier, S.D. **Ocorrência de tuberculose em bovinos abatidos no matadouro municipal de Patos - Paraíba - Brasil.** [Occurrence of tuberculosis in cattle slaughtered in the Patos municipal slaughter house - Paraíba - Brazil.] *Revista Brasileira de Ciencia Veterinaria.* 2000. 7 (1) 61-62. Note: In Portuguese with an English summary.

**Descriptors:** cattle, post-slaughter survey, bovine tuberculosis, histochemical and bacterial tests, macroscopic lesions, *Mycobacterium*, Brazil.

Tamba, M.; Natalini, S.; Mattioli, R.; Serra, P.; Palmonari, F. **Applicazione del D.LG. 196/1999: risultati di un'indagine conoscitiva negli allevamenti bovini della provincia di Bologna.** [Enforcement of Dir. 97/12/CE: results of a survey in cattle herds of Bologna Province, Italy.] *Selezione Veterinaria.* 2000. No. 3, 153-159. Note: In Italian with an English summary.

**NAL Call Number:** 241.71 B75

**Descriptors:** cattle, epidemiological survey, disease prevalence, surveillance system, tuberculosis, brucellosis, leucosis, disease control, *Mycobacterium*, Bologna, Italy.

UK, MAFF. **Animal Health 2000.** *Report of the Chief Veterinary Officer.* 2000. Ministry of Agriculture, Fisheries and Food (MAFF), London, UK

**Descriptors:** zoonotic disease, public health, disease prevention and control, animal welfare, BSE, tuberculosis, *Mycobacterium*, pets, livestock, transport, slaughter, UK.

Vordermeier, H.M.; Cockle, P.J.; Whelan, A.O.; Rhodes, S.; Hewinson, R.G. **Toward the development of diagnostic assays to discriminate between *Mycobacterium bovis* infection and bacille Calmette-Guerin vaccination in cattle.** *Clinical Infectious Diseases*. 2000. 30 (Suppl. 3) S291-S298.

**NAL Call Number:** RC111 R4

**Descriptors:** cattle, diagnosis, assays, vaccines, immunization, *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain.

Wahlstrom, H.; Carpenter, T.; Giesecke, J.; Andersson, M.; Englund, L.; Vagsholm, I. **Herd-based monitoring for tuberculosis in extensive Swedish deer herds by culling and meat inspection rather than by intradermal tuberculin testing.** *Preventive Veterinary Medicine*. Jan 20, 2000. 43 (3) 103-116. ISSN: 0167-5877

**NAL Call Number:** SF601.P7

**Descriptors:** deer farming herds, herd disease monitoring, *Mycobacterium bovis*, culling, diagnostic techniques, post slaughter meat inspection, zoonoses, disease transmission, Reed-Frost, simulation models, detection, Sweden.

Wards, B.J.; de Lisle, G.W.; Collins, D.M. **An *esat6* knockout mutant of *Mycobacterium bovis* produced by homologous recombination will contribute to the development of a live tuberculosis vaccine.** *Tubercle and Lung Disease*. 2000. 80 (4-5) 185-189.

**Descriptors:** *esat6* knockout mutant, virulent strain of *M. bovis*, guineapigs, inoculated, mutant/parent strain comparison, intradermal skin tests, bovine purified protein derivative, recombinant ESAT6 protein, Southern blot, PCR, vaccine development, live vaccines.

Waters, W.R.; Palmer, M.V.; Pesch, B.A.; Olsen, S.C.; Wannemuehler, M.J.; Whipple, D.L. **Lymphocyte subset proliferative responses of *Mycobacterium bovis*-infected cattle to purified protein derivative.** *Veterinary Immunology and Immunopathology*. 2000. 77 (3-4) 257-273. ISSN: 0165-2427

**NAL Call Number:** SF757.2.V38

**Descriptors:** lymphocytes, lymphocyte transformation, immune response, tuberculosis, T lymphocytes, cell mediated immunity, *Mycobacterium bovis*, cattle diseases.

Waters W.R.; Palmer, M.V.; Pesch, B.A.; Olsen, S.C.; Wannemuehler, M.J.; Whipple, D.L. **MHC class II-restricted, CD4+ T-cell proliferative responses of peripheral blood mononuclear cells from *Mycobacterium bovis*-infected white-tailed deer.** *Veterinary Immunology and Immunopathology*. 2000. 76 (3-4) 215-229. ISSN: 0165-2427

**NAL Call Number:** SF757.2.V38

**Descriptors:** white-tailed deer, wildlife, disease reservoir, *Mycobacterium bovis*, cattle, predators, humans, CD4+subset lymphocytes, CD8+, gammadelta TCR+, B cells, immune response, lymphocyte transformation, monoclonal antibodies, major histocompatibility component.

Wedlock, D.N.; Vesosky, B.; Skinner, M.A.; de Lisle, G.W.; Orme, I.M.; Buddle, B.M. **Vaccination of cattle with *Mycobacterium bovis* culture filtrate proteins and interleukin-2 for protection against bovine tuberculosis.** *Infection and Immunity*. Oct 2000. 68 (10) 5809-5815. ISSN: 0019-9567

**NAL Call Number:** QR1.I57

**Abstract:** In this study vaccines prepared from culture filtrate proteins (CFP) of *Mycobacterium bovis* and interleukin-2 (IL-2) were tested in cattle for their capacity to stimulate immune responses and to protect against an intratracheal challenge with virulent *M. bovis*. Nine groups of cattle were vaccinated with combinations of different doses of CFP and bovine IL-2 mixed with a monophosphoryl lipid A (MPL) adjuvant. An additional group was vaccinated with *M. bovis* BCG. Immune responses in CFP-IL-2-vaccinated animals differed from those seen in BCG-vaccinated animals by inducing high antigen-specific antibody responses and low levels of gamma interferon and IL-2 released from purified protein derivative-stimulated whole-blood cultures. In a concurrent experiment, additional animals were added to the high-dose CFP-IL-2, MPL control, and BCG groups and these expanded groups of animals were challenged intratracheally with virulent *M. bovis*. Although the lung lesion scores were significantly lower for both the CFP-IL-2- and BCG-vaccinated groups compared to the MPL control group, the overall level of protection was greatest for the BCG-vaccinated animals. There were more animals with extrathoracic spread of disease in the CFP-IL-2 group than in the other groups. While vaccination of cattle with *M. bovis* CFP gave an encouraging reduction in tuberculous lesions

and did not induce a delayed-type hypersensitivity response to PPD, future CFP vaccines must prevent any extrathoracic spread of disease.

**Descriptors:** *Mycobacterium*, bacterial antigens, protective antigens, vaccine development, antibody formation, T lymphocytes.

Weinhaupl, I.; Schopf, K.C.; Khaschabi, D.; Kapaga, A.M.; Msami, H.M. **Investigations on the prevalence of bovine tuberculosis and brucellosis in dairy cattle in Dar es Salaam region and in zebu cattle in Lugoba area, Tanzania.** *Tropical Animal Health and Production*. June 2000. 32 (3) 147-154. ISSN: 0049-4747

**NAL Call Number:** SF601.T7

**Descriptors:** dairy cows, zebu, disease prevalence, *Mycobacterium bovis*, *Brucella abortus*, brucellosis, delayed type hypersensitivity, *Mycobacterium tuberculosis*, serological surveys, milkborne diseases, Tanzania.

Whipple, D.L.; Mitchell, M.V.; Brown, C. (ed.); Bolin, C. **Reemergence of tuberculosis in animals in the United States.** *Emerging Diseases of Animals*. 2000. p. 281-299. American Society for Microbiology (ASM), Washington, USA.

**NAL Call Number:** SF781 E53 2000

**Descriptors:** cattle, disease prevention and control, disease transmission, epidemiology, reviews, wild animals, *Mycobacterium bovis*, US.

Wolf, C.; Harsh, S.; Lloyd, J. **Valuing losses from depopulating Michigan dairy herds.** *Staff Paper, Department of Agricultural Economics, Michigan State University*. 2000. No. 2000-10, 18 pp.

**NAL Call Number:** HD1401 S46

**Descriptors:** animal diseases, dairy cattle, disease control and eradication, depopulation, farm level economic impacts, livestock numbers, losses, methodology, returns, valuation, Michigan.

Wyss, D.; Giacometti, M.; Nicolet, J.; Burnens, A.; Pfyffer, G.E.; Audige, L. **Farm and slaughter survey of bovine tuberculosis in captive deer in Switzerland.** *Veterinary Record*. Dec 16, 2000. 147 (25) 713-717. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** deer, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, tuberculosis, farm surveys, disease surveys, lymph nodes, livestock numbers, Switzerland.

Yearsley, D.; O'Rourke, J.; Griffin, M.; Nearney, M.; Egan, J. **Detection of *Mycobacterium tuberculosis* complex organisms in tissue samples from bovine lymph nodes: comparison of two rapid methods and Lowenstein-Jensen medium with the Bactec 460 TB system.** *Irish Veterinary Journal*. 2000. 53 (1) 29-31.

**NAL Call Number:** 41.8 IR4

**Descriptors:** cattle, lymph node tissue samples, rapid diagnostic methods, comparison study, Lowenstein-Jensen (L-J) medium, Bactec 460 TB system, tuberculosis, histopathology, *Mycobacterium tuberculosis*, *Mycobacterium bovis*.

Yener, Z.; Erer, H. **Konya mezbahalarında kesilen sigirlarda bobrek lezyonlari uzerinde patolojik incelemeler. [The pathology of kidney abnormalities in cattle slaughtered at Konya Slaughterhouses.]** *Veteriner Bilimleri Dergisi*. 2000. 16 (2) 63-74. Note: In Turkish with an English summary.

**Descriptors:** cattle, post slaughter examination, pathology, a number of conditions listed, tuberculosis, amyloid deposition, nephritis, hemoglobinuric nephrosis, granulomatous nephritis, Turkey.

## 1999

Abdala, A.A.; Tarabla, H.D.; Bertero, S.; Torres, P. **Vigilancia epidemiologica de tuberculosis bovina en el Dpto. Castellanos, Santa Fe (Argentina). [Epidemiological surveillance of bovine tuberculosis in the Castellanos region, Santa Fe (Argentina).]** *Revista de Medicina Veterinaria, Buenos Aires*. 1999. 80 (5) 357-360. Note: In Spanish with an English summary.

**NAL Call Number:** 41.8 B86

**Descriptors:** *Mycobacterium tuberculosis*, bovine tuberculosis, slaughter houses, Friesian cows, cattle, lesions, lungs, lymph nodes, post slaughter examinations, herds, epidemiological surveys, disease surveys, epidemiology, bacterial diseases, Argentina.

Abdala, A.A.; Tarabla, H.D.; Bertero, S.; Torres, P. **Vigilancia epidemiologica de la tuberculosis bovina en el**

**departamento Castellanos, Santa Fe. [Epidemiological surveillance of bovine tuberculosis in the department of Castellanos, Santa Fe].** *Revista Argentina de Microbiologia*. 1999. 31 (Suppl. 1) 13-14. Note: Segundo Taller Internacional sobre Infecciones Humanas y Animales Producidas por Clamidas, Micobacterias, Brucelas y Borrelias, Buenos Aires, 25 Junio-4 Julio, 1997. In Spanish.

**Descriptors:** cattle, *Mycobacterium bovis*, monitoring, epidemiology, tuberculosis infections, disease prevalence, surveillance, Argentina.

Ahmed, A.S.N.; Khan, J.R.; Ganai, N.A. **DNA amplification assay for rapid detection of bovine tubercle bacilli in semen.** *Animal Reproduction Science*. Oct 31, 1999. 57 (1/2) 15-21. ISSN: 0378-4320

**NAL Call Number:** QP251.A5

**Descriptors:** cattle, bulls, semen, *Mycobacterium tuberculosis*, polymerase chain reaction, detection, diagnostic techniques, shedding, artificial insemination, *Mycobacterium bovis*.

Al Sadi, H.I.; Al Sultan, I.I. **A report of two cases of bovine tuberculosis in Ninevha province.** *Iraqi Journal of Veterinary Sciences*. 1999. 12 (2) 379-382. Note: In English with an Arabic summary.

**Descriptors:** cattle, *Mycobacterium*, tuberculosis, case reports, pathology, histopathology, Iraq.

Anonymyous. **Complexities of controlling TB.** *Veterinary Record*. May 1, 1999. 144 (18) 485. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, tuberculosis, *Mycobacterium*, disease control, badgers, *Meles meles*, government policy, UK.

Anonymyous. **Control of bovine TB: a gap to be filled.** *Veterinary Record*. July 31, 1999. 145 (5) 117. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, tuberculosis, disease control, *Mycobacterium*, UK.

Anonmyous. **Northeast Michigan surveillance activities for bovine tuberculosis in the livestock and free-ranging deer populations. Update: September 15, 1998.** *Dairy, Food and Environmental Sanitation*. 1999. 19 (1) 35-38.

**NAL Call Number:** SF221 D342

**Descriptors:** cattle, deer, *Mycobacterium bovis*, *Procyon lotor*, *Odocoileus virginianus*, tuberculosis, livestock, wild animals, disease control, disease prevalence, Michigan.

Anonymyous. **Searching for a solution.** *Veterinary Record*. Oct. 16, 1999. 145 (16) 441. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, tuberculosis, disease control, disease statistics, *Mycobacterium*, Great Britain.

Anonymyous. **TB and the short term.** *Veterinary Record*. Mar 20, 1999. 144 (12) 301. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, badgers, *Meles meles*, tuberculosis, disease control, *Mycobacterium bovis*, Great Britain.

Arellano-Reynoso, B.; Ramirez-Casillas, I.C.; Diaz-Aparicio, E.; Valero-Elizondo, G.; Santillan-Flores, M.A. **Diagnostico de tuberculosis en hatos de caprinos empleando la prueba intradermica doble comparativa y cultivo bacteriologico. [Diagnosis of tuberculosis in goat flocks using the double intradermal test and bacteriology.]** *Tecnica Pecuaria en Mexico*. 1999. 37 (1) 55-58. Note: In Spanish with an English summary.

**NAL Call Number:** 49 T222

**Descriptors:** goats, tuberculosis survey, disease prevalences, double intradermal test, purified protein derivative, PPD, necropsy, tissue analysis, asymptomatic infections, *Mycobacterium fortuitum*, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium vaccae*, Mexico.

Atsanda, N.N.; Agbede, S.A. **A survey for brucellosis, tuberculosis and cysticercosis in cattle slaughtered in Ibadan and Maiduguri abattoirs.** *Nigerian Veterinary Journal*. 1999. 20 (1) 61-66.

**Descriptors:** post-slaughter survey, cattle, diseases prevalence, brucellosis, tuberculosis and cysticercosis, zoonotic diseases, metacestodes, parasites, helminths, *Taenia*, *Mycobacterium*, Nigeria.

Bachvarova, Y.; Kostov, G.; Lilkova, N.; Savova, S.; Bardarov, I.; Baitchev, Z. **Occurrence of the non-specific tuberculin reactions in cattle and nature of the accompanying pathomorphological and bacterial findings.**

*Bulgarian Journal of Veterinary Medicine*. 1999. 2 (1) 33-39.

**Descriptors:** cattle, tuberculin skin tests, *Mycobacterium*, abscesses, pathology, parasites, sarcocystosis, leucosis, actinomycosis, pericarditis, diagnosis, tuberculosis, delayed type hypersensitivity, diagnostic techniques, bacterial diseases, *Actinomyces*, *Echinococcus*, *Fasciola*, *Arcanobacterium pyogenes*, *Mycobacterium tuberculosis*.

Bicknell, K.B.; Wilen, J.E.; Howitt, R.E. **Public policy and private incentives for livestock disease control.**

*Australian Journal of Agricultural and Resource Economics*. Dec 1999. 43 (4) 501-521. ISSN: 1364-985X

**NAL Call Number:** HD1401.A89

**Descriptors:** cattle, *Didelphidae*, bovine tuberculosis, *Mycobacterium*, disease control, dynamic bioeconomic models, wildlife, disease vectors, public sector, incentives, effectiveness of control policies, New Zealand.

Black, H.; Simper, J.M.; Bloom, D.; Bloom, K. **A behaviour study on the potential for direct transmission of tuberculosis from possums (*Trichosura vulpecula*) to alpacas (*Lama pacos*), and the converse from alpacas to possums.** *New Zealand Veterinary Journal*. 1999. 47 ( 6) 204-206.

**NAL Call Number:** 41.8 N483

**Descriptors:** alpaca farm, tuberculosis, *Mycobacterium*, behavior study, impacts on disease transmission, interactions with brushtailed possums, possible aerosol transmission, stamping behavior, nose to nose contact, New Zealand.

Buddle, B.M.; Parlane, N.A.; Keen, D.L.; Aldwell, F.E.; Pollock, J.M.; Lightbody, K.; Andersen, P. **Differentiation between *Mycobacterium bovis* BCG-vaccinated and *M. bovis*-infected cattle by using recombinant mycobacterial antigens.** *Clinical and Diagnostic Laboratory Immunology*. 1999. 6 (1) 1-5.

**Descriptors:** cattle, *Mycobacterium bovis*, vaccination, tuberculosis, recombinant antigens-- MPB59, MPB64, MPB70 and ESAT-6, whole blood gamma interferon assay, skin test, experimental infection of calves with *M. bovis*, bacterial diseases, attempt to determine BCG vaccination, non-vaccinated groups, comparison study.

Caley, P.; Hickling, G.J.; Cowan, P.E.; Pfeiffer, D.U. **Effects of sustained control of brushtail possums on levels of *Mycobacterium bovis* infection in cattle and brushtail possum populations from Hohotaka, New Zealand.** *New Zealand Veterinary Journal*. 1999. 47 (4) 133-142.

**NAL Call Number:** 41.8 N483

**Descriptors:** cattle, brushtail possum, wildlife disease reservoir, population density, tuberculosis, *Mycobacterium bovis*, pest control, disease prevalence, disease transmission, epidemiology, *Trichosurus vulpecula*, pest population levels and control, New Zealand.

Caro, R.R.; Gutierrez, L.R. **Prevencion de enfermedades infecciosas en equinos. [Prevention of equine infectious diseases.]** *Veterinaria Argentina*. 1999. 16 (158) 592-606. Note: In Spanish with an English summary.

**NAL Call Number:** SF604 V463

**Descriptors:** horses, equine infectious diseases, disease control and prevention, epidemiology, reviews, tetanus, brucellosis, tuberculosis, anthrax, leptospirosis, botulism, salmonellosis, encephalitis, rabies, *Mycobacterium*, influenza, infectious anemia and arteritis viruses, Argentina.

Carter, C.E.; Budge, G. **The national cattle and deer ID programme.** *Publication –Veterinary Continuing Education, Massey University*. 1999. No. 189, 177-181. 29th Seminar of the Society of Sheep and Beef Cattle Veterinarians NZVA, Hastings, New Zealand, 1-3 March 1999. Note: A conference proceedings.

**NAL Call Number:** SF604 P82

**Descriptors:** identification, deer, cattle, identification program, tuberculosis, *Mycobacterium*.

Cassidy, J.P.; Bryson, D.G.; Pollock, J.M.; Evans, R.T.; Forster, F.; Neill, S.D. **Lesions in cattle exposed to *Mycobacterium bovis*-inoculated calves.** *Journal of Comparative Pathology*. 1999. 121 (4) 321-337.

**NAL Call Number:** 41.8 J82

**Descriptors:** cattle tuberculosis, experimental infection, disease transmission, pathogenesis, pathology, lung lesions, calves, histopathology, lymphocyte transformation, interferon, models, immune response, bacterial diseases, *Mycobacterium bovis*.

Cassidy, J.P.; Bryson, D.G.; Neill, S.D. **Tonsillar lesions in cattle naturally infected with *Mycobacterium bovis*.** *Veterinary Record*. 144 (6) 139-142. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, *Mycobacterium bovis*, lesions, tonsils, tuberculosis, respiratory system, lymph nodes, histopathology.

Cho, Y.S.; Kim, J.M.; Jung, S.C.; Woo, S.R.; Kim, J.Y.; Yoo, H.S.; Park, Y.H.; Ahn, J.S. **Diagnosis of bovine tuberculosis by single intradermal comparative tuberculin test and gamma-interferon assay.** *Korean Journal of Veterinary Research*. 1999. 39 (6) 1119-1125. Note: In Korean with an English summary.

**NAL Call Number:** 41.9 T12

**Descriptors:** cattle, tuberculin skin test, *Mycobacterium bovis*, *Mycobacterium avium*, tuberculosis, diagnosis, diagnostic techniques, guineapigs, Korea Republic.

Cobb, A.J.; Frothingham, R. **The GroES antigens of *Mycobacterium avium* and *Mycobacterium paratuberculosis*.** *Veterinary Microbiology*. 1999. 67 (1) 31-35.

**NAL Call Number:** SF601 V44

**Descriptors:** *Mycobacterium avium*, *Mycobacterium leprae*, *Mycobacterium tuberculosis*, *Mycobacterium avium* ssp. *paratuberculosis*, heat shock protein genes cloned and sequenced, GroES, immunodominant epitopes, conserved sequences, antigens.

Coleman, J.D.; Thomas, M.D.; Pracy, L.T.; Hansen, Q. **Fluctuations in possum numbers in the Pararaki Valley, Haurangi State Forest Park.** *Science for Conservation*. Department of Conservation; Wellington; New Zealand. 1999. No. 128, 16 pp.

**Descriptors:** brushtail possums, forests, colonization, trapping, pests, introduced species, wild animals, vertebrate pests, forest pests, nature conservation, livestock animal diseases, tuberculosis, population dynamics, national parks, reservoir hosts, *Trichosurus vulpecula*, New Zealand.

Coleman, J.D.; Cooke, M.M.; Jackson, R.; Webster, R. **Temporal patterns in bovine tuberculosis in a brushtail possum population contiguous with infected cattle in the Ahaura Valley, Westland.** *New Zealand Veterinary Journal*. 1999. 47 (4) 119-124.

**NAL Call Number:** 41.8 N483

**Descriptors:** brushtail possum, *Trichosurus vulpecula*, temporal and spatial patterns, contiguously with livestock, disease transmission trapping study, New Zealand, tubercular lesions, wildlife disease reservoirs, population size related to incidence of disease.

Collins, C.H.; Grange, J.M. **Transmission of bovine TB in cattle: A critical reappraisal.** *Letters in Applied Microbiology*. Aug 1999. 29 (2) 146. ISSN: 0266-8254. Note: Discussion of the article "Transmission of bovine TB: A critical reappraisal" by M. Hancox this journal, 28 (3), p. 242-244, Mar 1999.

**NAL Call Number:** QR1.L47

**Descriptors:** cattle, tuberculosis, disease transmission, *Mycobacterium bovis*, letter.

Cooke, M.M.; Buddle, B.M.; Aldwell, F.E.; McMurray, D.N.; Alley, M.R. **The pathogenesis of experimental endo-bronchial *Mycobacterium bovis* infection in brushtail possums (*Trichosurus vulpecula*).** *New Zealand Veterinary Journal*. 1999. 47 (6) 187-192.

**NAL Call Number:** 41.8 N483

**Descriptors:** experimental infection, brushtail possums, *Mycobacterium bovis*, necropsy of lesions, various internal organs, peripheral blood lymphocyte blastogenic responses, pathogenesis.

Cross, M.L.; Qureshi, T.; Mackintosh, C.G. **Oxidative responses in ferret macrophages.** *Veterinary Immunology and Immunopathology*. Feb 1, 1999. 67 (2) 171-184. ISSN: 0165-2427

**NAL Call Number:** SF757.2.V38

**Abstract:** Although the basic function of T and B lymphocytes in ferrets has been known for some time, the function of mononuclear phagocytes has not been described in this species. The present study has characterised basic oxidative responses in ferret macrophages, and has investigated the effects of endogenous and exogenous modulators of macrophage function on oxidative capacity in vitro. Macrophages derived from the blood or lungs of ferrets were shown capable of generating the reactive oxygen intermediate (ROI) molecules superoxide and hydrogen peroxide, and secreting a lysosomal enzyme (acid phosphatase), in response to appropriate stimuli. A T cell supernatant (derived from mitogen-stimulated peripheral blood lymphocytes) was able to activate both blood-and lung-derived macrophages for enhanced ROI production, while specific ROI inhibitors (superoxide dismutase and catalase) were able to partially

ablate ROI activity. The accumulation of nitrite in culture supernatants, as an indicator for the production of reactive nitrogen intermediates, could not be demonstrated by ferret macrophages derived from either tissue source. In contrast to the enhancing effects of TCS on the oxidative function of blood-derived macrophage, exposure to bacterial LPS caused marked suppression of ROI and lysosomal enzyme production by these cells. Finally, the generation of superoxide anion, following phagocytosis of live or heat-killed *Mycobacterium bovis* or zymosan, indicated that ROI production in response to phagocytic stimulation was relatively weak in ferret blood-derived macrophages. These results are discussed in relation to the study of immune function in a novel species, and with particular reference to research into tuberculosis (Tb), since ferrets are important wildlife vectors of bovine Tb in New Zealand.

**Descriptors:** ferrets, *Mustelo furo*, oxidation, macrophages, T lymphocytes, B lymphocytes, phagocytes, oxides, acid phosphatase, secretion, superoxide dismutase, catalase, activity, nitrite, culture filtrates lipopolysaccharides.

Das, S.K.; Bhatia, S. **Gamma-interferon bioassay for detection of bovine tuberculosis in cattle: kinetics of production and dose response in whole blood culture.** *Indian Journal of Experimental Biology*. 1999. 37 (10) 1039-1041.

**NAL Call Number:** 442.8 IN2

**Descriptors:** *Mycobacterium bovis*, PPD sensitized lymphocytes, release gamma interferon, kinetics, T lymphocytes, cattle, detection.

De N. Gomes, N.B.; Rostagno, M.H.; von G. do Santos, G.J.; Aguiar, P.H.P. **Frequencia de lesoes em bovinos abatidos no matadouro municipal da cidade de Lavras, MG. [Frequency of lesions in cattle slaughtered at the municipal abattoir in Lavras, Minas Gerais, Brazil.]** *Veterinaria Noticias*. 1999. 5 (1) 41-46. Note: In Portuguese with an English summary.

**NAL Call Number:** SF604 V484

**Descriptors:** cattle, post slaughter, lesions on various organs, levels of tuberculosis and cystecercosis, *Mycobacterium*, Brazil.

De Oliveira, P.R.; de A. Ribeiro, S.C.; Garcia, C.A.; de O. Reis, D. **Prevalencia e tendencia da tuberculose em bovinos abatidos em Uberlandia - MG, de 1984 a 1996. [Prevalence and tendency of tuberculosis in slaughtered bovines in Uberlandia-MG, 1984-1996.]** *Bioscience Journal*. 1999. 15 (1) 39-48. Note: In Portuguese with an English summary.

**NAL Call Number:** QH301 R485

**Descriptors:** cattle, tuberculosis, post slaughter survey, carcasses, lymph nodes, abattoirs, disease surveys, disease prevalence, *Mycobacterium tuberculosis*, Brazil.

De Souza, A.V.; Antunes-e-Souza, C.F.; de Souza, R.M.; Ribeiro, R.M.P.; de Ligouri-Oliveira, A. **A importancia da tuberculose bovina como zoonose. [The importance of bovine tuberculosis as a zoonosis].** *Higiene Alimentar*. 1999. 13 (59) 22-27. Note: In Portuguese with an English summary.

**Descriptors:** cattle, humans, *Mycobacterium bovis*, zoonoses, tuberculosis, epidemiology, skin testing, disease transmission, disease prevalence, diagnosis.

Denny, G.O.; Wilesmith, J.W. **Bovine tuberculosis in Northern Ireland: a case-control study of herd risk factors.** *Veterinary Record*. Mar 20, 1999. 144 (12) 305-310. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, badgers, *Meles meles*, tuberculosis, herd health, risk factors, epidemiology, boundaries, disease transmission, *Mycobacterium bovis*, Northern Ireland.

Diaz, F.; Masso, F.; Paez, A.; Varela, E.; Suarez-Guemes, F.; Montano, L.F. **Secretion of IFN-gamma by bovine peripheral blood mononuclear cells stimulated with *Mycobacterium bovis* protein fractions obtained by isoelectric-focusing.** *Veterinary Immunology and Immunopathology*. Feb 22, 1999. 67 (3) 203-212. ISSN: 0165-2427  
**NAL Call Number:** SF757.2.V38

**Abstract:** Due to the complexity and variety of biological effects found in *Mycobacterium bovis* (*M. bovis*) proteins analyzed solely on a molecular weight (MW) basis, we approached the purification of *M. bovis* proteins through their isoelectric point (pI). Twenty *M. bovis* culture filtrate protein extract (CFPE) isoelectric focused (IEF) protein fractions, confined between pI 3 and 10, were isolated. The MW of the major proteins isolated in the various fractions correlated with protein already reported 14-, 18-, 20-, 25-, 31-, 38-, 45-, 64-, 67- and 70 kDa by SDS-PAGE. Since several

different pI fractions showed proteins of the same MW we tested the ability of all IEF fractions to stimulate interferon-gamma (IFN-gamma) production by peripheral blood mononuclear cells (PBMC) isolated from cattle with well defined *M. bovis* tuberculosis (TB) infection. In animals with few lesions IFN-gamma inductive IEF fractions were in the acid range. As the number of lesions increased, neutral fractions were also inductive. Some fractions with relatively few proteins induced as much IFN-gamma production as others with abundant proteins. None of the 20 IEF fractions enhanced IFN-gamma production by anergic cells. We conclude that IFN-gamma production in diseased animals is induced mainly by acidic mycobacterial proteins and that the response towards these proteins is enhanced as the disease progresses, what coincides with higher PPD reactivity. However, the IFN-gamma production in anergic status was severely affected. We found that this cytokine production is spontaneous and antigen-independent.

**Descriptors:** cattle, *Mycobacterium bovis*, interferon, secretion, monocytes, bacterial proteins, fractionation, molecular weight, isoelectric point, lesions, biosynthesis, acidity.

Dvorska, L.; Havelkova, M.; Bartos, M.; Bartl, J.; Pavlik, I. **Inzerčni sekvence u mykobakterii a jejich využití při studiu epidemiologie mykobakteriálních infekcí. [Insertion sequences of mycobacteria and their use in the study of the epidemiology of mycobacterial infections.]** *Veterinarní Medicina*. 1999. 44 (8) 233-251. Note: In Czech with an English summary.

**NAL Call Number:** 41.9 C333

**Descriptors:** epidemiology, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium avium*, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, mycobacterial diseases, transposable elements of DNA.

Emmerzaal, A.; van Zijderveld, F.G.; Bakker, D. **Het belang van een goede diagnostiek voor rundertuberculose. [The importance of a good diagnostic technique for bovine tuberculosis.]** *Tijdschrift voor Diergeneeskunde*. 1999. 124 (24) 741-750. Note: In Dutch.

**NAL Call Number:** SF601 N4

**Descriptors:** *Mycobacterium bovis*, diagnostic techniques, tuberculin reaction, ELISA and gamma-interferon test, tuberculosis free status, Netherlands, EU.

Gonzalez-Llamazares, O.R.; Gutierrez-Martin, C.B.; Aranaz-Martin, A.; Liebana-Criado, E.; Dominguez-Rodriguez, L.; Rodriguez-Ferri, E.F. **Comparison of different methods for diagnosis of bovine tuberculosis from tuberculin- or interferon-gamma-reacting cattle in Spain.** *Journal of Applied Microbiology*. Oct 1999. 87 (4) 465-471. ISSN: 1364-5072

**NAL Call Number:** QR1.J687

**Abstract:** Of 1479 cattle from herds in Northwestern Spain previously diagnosed as tuberculosis (TB) positive, 218 animals which gave a positive tuberculin or interferon-gamma reaction were examined at the slaughterhouse. Medial retropharyngeal and caudal mediastinal lymph nodes, and any tissues containing lesions suspected to be tuberculous, were removed and submitted to the laboratory. Three techniques for diagnosis of TB were used: post mortem examination (PME), smear staining by means of auramine O method (AOM), and culture isolation in Coletsos and Lowenstein-Jensen media followed by confirmation of *M. tuberculosis* complex organisms using PCR (CIM-PCR). Only 123 (29.9%) of the 412 samples collected showed typical tuberculous lesions. Confirmed *M. tuberculosis* complex organisms were isolated in 144 cases, 114 of which were from tissues showing lesions (success rate of 92.8%). Smears were found positive in 113 cases, 96 of which came from lesions suspected to be tuberculous (success rate of 78.0%). The sensitivities of CIM-PCR compared with those of PME and AOM were 92.7% and 85.7%, respectively. Statistical analysis revealed that PME and AOM are good indicators of the presence of *M. tuberculosis* complex organisms in tuberculin- or interferon-gamma reacting cattle.

**Descriptors:** *Mycobacterium tuberculosis*, cattle, disease incidence, post-slaughter, Spain.

Gonzalez-Llamazares, O.R.; Gutierrez-Martin, C.B.; Alvarez-Nistal, D.; De la Puente-Redondo, V.A.; Dominguez-Rodriguez, L.; Rodriguez-Ferri, E.F. **Field evaluation of the single intradermal cervical tuberculin test and the interferon-gamma assay for detection and eradication of bovine tuberculosis in Spain.** *Veterinary Microbiology*. Oct 1999. 70 (1/2) 55-66. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Abstract:** A field comparison of the interferon-gamma (IFN-gamma) assay and the single intradermal cervical tuberculin (SICT) test for the diagnosis of bovine tuberculosis was conducted. A total of 1136 cattle belonging to 85 herds placed in 'Castilla y Leon' (northwestern Spain) were chosen, and 21 of these herds were subjected to the diagnostic assays two or three times at intervals of at least 4 months. All the animals positive to any of the tests were

slaughtered and tuberculosis was confirmed by culture isolation method (CIM) and further identification by means of PCR. Only 10.6% of cattle reacted with the bovine PPD in the SICT test, a percentage that increased to 12.8% in the IFN-gamma assay. The sensitivity of the IFN-gamma assay compared to CIM was shown to be higher (84.9%) than that of the SICT test (80.2%), but the combination of both tests offered the highest sensitivity (92.9%). The number of false positive reactors (those animals in which CIM was negative) was considerably higher for the IFN-gamma assay than for the SICT test and, conversely, the number of false negative animals (*M. bovis* isolation but negative immunological result) was higher for the skin test than for the interferon assay. In the herds tested twice, tuberculosis was eradicated after the second cycle of testing in 50%, and in 75% after the third cycle in herds tested three times. The combination of these two techniques instead of separately seems, therefore, to be useful in eradication programmes against bovine tuberculosis.

**Descriptors:** cattle, *Mycobacterium bovis*, detection, diagnosis, field tests, tuberculin, interferon, disease control, incidence, disease prevalence, tuberculosis, skin tests, diagnostic value, Spain.

Gutierrez, M.; Garcia-Marin, J.F. ***Cryptococcus neoformans* and *Mycobacterium bovis* causing granulomatous pneumonia in a goat.** *Veterinary Pathology*. 1999. 36 (5) 445-448. ISSN: 0300-9858

**NAL Call Number:** 41.8 P27

**Descriptors:** goat, Blanca-Celtiberica doe, case study, mixed infection, *Cryptococcus neoformans*, *Mycobacterium bovis*, pulmonary focal caseous nodules, pneumonia, impaired immune status.

Hancox, M. **A critical reappraisal of transmission routes for bovine TB in cattle.** *Respiratory Medicine*. 1999. 93 (3) 220-223.

**Descriptors:** cattle, badgers, *Mycobacterium*, tuberculosis, disease control, epidemiology, zoonoses, disease transmission, wildlife disease reservoirs, UK.

Hancox, M. **Transmission of bovine TB in cattle: a critical reappraisal.** *Letters in Applied Microbiology*. March 1999. 28 (3) 242-244. ISSN: 0266-8254

**NAL Call Number:** QR1.L47

**Descriptors:** tuberculosis, disease transmission, letters correspondence.

Hardjoutomo, S. **Tuberkulosis sapi dan peranannya bagi peternakan sapi di Indonesia. [Bovine tuberculosis and its role in cattle farming in Indonesia.]** *Journal Penelitian and Pengembangan Pertanian*. 1999. 18 (2) 63-67. Note: In Indonesian with an English summary.

**Descriptors:** *Mycobacterium bovis*, tuberculosis, beef cattle, dairy cattle, tuberculin, zoonoses, diagnosis, disease prevention.

Hutchings, M.R.; Harris, S. **Quantifying the risks of TB infection to cattle posed by badger excreta.** *Epidemiology and Infection*. 1999. 122 (1) 167-174.

**NAL Call Number:** RA651 A1E74

**Descriptors:** cattle, wild badgers, *Meles meles*, deterministic approach, grazing contact with excreta, investigatory contact with excreta, muzzle to sward contact, infection probability, *Mycobacterium bovis*, England, transmission levels, risk assessment.

Joardar, S.N.; Ram, G.C. **Effect of fractionated antigens of *Mycobacterium bovis* AN5 on blood mononuclear cells of cattle.** *Indian Journal of Animal Sciences*. 1999. 69 (1) 7-11.

**NAL Call Number:** 41.8 IN22

**Descriptors:** cattle mononuclear blood cells, *Mycobacterium bovis* antigen AN5, immunogenetics, in vitro methods, lymphocyte transformation, tuberculosis, diagnosis, lymphocproliferation and nitrite production, bacterial diseases.

Jorge, M.C.; Schettino, D.M.; Egoburu, F.; Vaninetti, R.; Schang, E.; Gonzalez, H. **Evaluacion del uso de la prueba tuberculinica en rodeos de cria y tambo - 1995/96. [Evaluation of the tuberculin skin test for use in dairy and beef herds - 1995/96.]** *Veterinaria Argentina*. 1999. 16 (151) 8-14. Note: In Spanish with an English summary.

**NAL Call Number:** SF604 V463w/yak pro

**Descriptors:** dairy and beef herds; tuberculin skin tests, diagnosis of tuberculosis, *Mycobacterium bovis*, Argentina.

Kanameda, M.; Ekgatat, M.; Wongkasemjit, S.; Sirivan, C.; Pachimasiri, T.; Kongkrong, C.; Buchaphan, K.; Boontarat, B. **An evaluation of tuberculin skin tests used to diagnose tuberculosis in swamp buffaloes (*Bubalus bubalis*).**

*Preventive Veterinary Medicine*. Mar 29, 1999. 39 (2) 129-135. ISSN: 0167-5877. Note: Paper presented at the VIII International Symposium on Veterinary Epidemiology and Economics, July 8-11, 1997. Paris, France.

**NAL Call Number:** SF601.P7

**Descriptors:** buffaloes, tuberculin skin tests, diagnostic techniques, tuberculosis, evaluation, diagnosis, postmortem examinations, herd health monitoring, *Mycobacterium bovis*, diagnostic value, caudal fold skin tests, cervical skin test, stormont skin test.

Kao, R.R.; Roberts, M.G. **A comparison of wildlife control and cattle vaccination as methods for the control of bovine tuberculosis.** *Epidemiology and Infection*. 1999. 122 (3) 505-519.

**NAL Call Number:** RA651 A1E74

**Descriptors:** *Mycobacterium bovis*, cattle, possums, *Trichosurus vulpecula*, cost of putative Tb, eradication, possum culling, vaccination of cattle or possums, compared, 1080 poison bait, wild animal disease reservoirs, epidemiology, mathematical models, New Zealand.

Kean, J.M.; Barlow, N.D.; Hickling, G.J. **Evaluating potential sources of bovine tuberculosis infection in a New Zealand cattle herd.** *New Zealand Journal of Agricultural Research*. 1999. 42 (1) 101-106.

**NAL Call Number:** 23 N4892

**Descriptors:** cattle, disease control, epidemiology, *Mycobacterium bovis*, tuberculosis, disease transmission, wild animals as disease reservoirs, brushtail possum, *Trichosurus vulpecula*, New Zealand.

Kostov, G.; Bachvarova, Y.; Stephanov, M.; Arnaoudov, A. **Occurrence of antibodies against *Actinomyces pyogenes* in blood sera from cattle showing non-specific tuberculin reactions.** *Bulgarian Journal of Veterinary Medicine*. 1999. 2 (1) 41-45.

**Descriptors:** tuberculin skin tests, non-specific tuberculin reactions, agglutination, agglutinins, antigens, diagnosis, tuberculosis, diagnostic techniques, blood serum samples, bacterial diseases, *Actinomyces*, *Arcanobacterium pyogenes*, cattle, *Mycobacterium bovis*, *Mycobacterium avium*.

Kumar, G.S.N.; Govindiah, M.G.; Nagaraj, C.S.; Bindu, A.; Rasool, T.J. **Does the natural resistance associated macrophage protein (Nramp) gene confer resistance/susceptibility in bovines against mycobacterial infection?** *Current Science*. 1999. 77 (6) 809-812.

**NAL Call Number:** 475 Sci23

**Descriptors:** mycobacterial infection, mice, BCG locus contains natural resistance, macrophage protein gene, point mutations, resistance and susceptibility, TB, search for similarity in bovine genome, *Mycobacterium*, cattle resistance factors.

Lazovskaya, A.L.; Vorob'eva Z.G.; Slinina, K.N.; Ispolatov, V.A. **Diagnosis of horned cattle tuberculosis with the use of the microsphere test.** [*Russian Agricultural Sciences.*] 1999. No. 4, 45-49; *Doklady Rossiiskoi Akademii Sel'skokhozyaistvennykh Nauk*. 1999. No. 4.

**NAL Call Number:** S1 S68

**Descriptors:** latex agglutination test, specificity, sensitivity, diagnostic value, cattle tuberculosis, *Mycobacterium bovis*, antibodies.

Liebana, E.; Girvin, R.M.; Welsh, M.; Neill, S.D.; Pollock, J.M. **Generation of CD8+ T-cell responses to *Mycobacterium bovis* and mycobacterial antigen in experimental bovine tuberculosis.** *Infection and Immunity*. 1999. 67 (3) 1034-1044. ISSN: 0165-2427

**NAL Call Number:** SF57.2.V38

**Descriptors:** cattle, tuberculosis, *Mycobacterium*, immune response, in vitro activation of CD 8+ T lymphocytes, antigens, surface antigens, lymphocyte antigens, experimental infections, immune response, PPD<sub>b</sub>, proliferative responses, peripheral blood mononuclear cells, gamma interferon, brefeldin A, cytochalasin D.

Lilenbaum, W.; Schettini, J.C.; Souza, G.N.; Ribeiro, E.R.; Moreira, E.C.; Fonseca, L.S. **Comparison between a gamma-IFN assay and intradermal tuberculin test for the diagnosis of bovine tuberculosis in field trials in Brazil.** *Journal of Veterinary Medicine, Series B*. June 1999. 46 (5) 353-358. ISSN: 0931-1793

**NAL Call Number:** 41.8 Z52

**Descriptors:** dairy cattle, *Mycobacterium bovis*, bioassays, interferon, diagnosis, field experimentation, diagnostic techniques, immunodiagnosis, evaluation, tuberculin, risk assessment, Rio de Janeiro, Brazil.

Lilenbaum, W.; Ribeiro, E.R.; Souza, G.N.; Moreira, E.C.; Fonseca, L.S.; Ferreira, M.A.S.; Schettini, J. **Evaluation of an ELISA-PPD for the diagnosis of bovine tuberculosis in field trials in Brazil.** *Research in Veterinary Science.* June 1999. 66 (3) 191-195. ISSN: 0034-5288  
**NAL Call Number:** 41.8 R312

**Abstract:** Bovine tuberculosis is a major health problem in Brazil. The intradermal tuberculin test is the standard test for its detection but it can lack both sensitivity and specificity. The purpose of this study was to evaluate a bovine enzyme-linked immunosorbent assay-(ELISA-ppd) under field conditions in Brazil. A total of 1632 animals from 13 dairy farms were tested with the intradermal tuberculin test (ITT). Two hundred and seven cows gave a positive reaction, which represents 12(.7 per cent of the cattle studied. The sensitivity specificity rates to ITT were 87(.7 per cent and 95(.2 per cent, respectively. From the 1632 animals 15 per cent of each herd (220 in total) were selected to be tested by the ELISA. Differences between mean optical density (OD) of the control group, ITT-positive and ITT-negative groups were all significant ( $P < 0(.01$ ). The sensitivity rates to ELISA-PPD were 86(.7 percent, while specificity was 90(.6 per cent. The use of ELISA-PPD is suggested for situations where the investigation of the whole herd is more important than the individual testing of each cow. In addition, the ELISA-PPD can also be helpful when a collective diagnosis is desired to elucidate clinical suspicions of disease, or in the first steps of a control program, for identification of foci.

**Descriptors:** dairy cows, tuberculosis, *Mycobacterium bovis*, ELISA, diagnostic techniques, herds, diagnostic value, Brazil.

Lilenbaum, W. **O uso de ELISA para o diagnostico da tuberculose bovina no Brasil: uma possibilidade interessante?** [Use of ELISA for the diagnosis of bovine tuberculosis in Brazil: an interesting possibility?] *Revista Brasileira de Medicina Veterinaria.* 1999. 21 (1) 28-31. Note: In Portuguese with an English summary.  
**NAL Call Number:** SF604 R38

**Descriptors:** cattle, ELISA, diagnosis, *Mycobacterium bovis*, tuberculosis, Brazil.

Lis, H. **Ocena wyników badania sanitarno-weterynaryjnego zwierząt rzeźnych i mięsa w Polsce w latach 1987-1997.** [An evaluation of veterinary inspection of slaughtered animals and meat in Poland between 1987 and 1997.] *Medycyna Weterynaryjna.* 1999. 55 (4) 243-246. Note: In Polish with an English summary.  
**NAL Call Number:** 41.8 M463

**Descriptors:** sheep, horses, liver flukes, *Fasciola*, *Taenia*, trichinosis, meat inspection, meat quality, cattle, pigs, calves, post slaughter examination, lesions carcasses, tuberculosis, septicaemia, neoplasms, leukemia, jaundice, emaciation, disease prevalence, muscular diseases, parasites, helminthes, Poland.

Longeri, M.; del Bo, L.; Vercelloni, L.; Amadori, M.; Archetti, I.L.; Zanotti, M. **BoLA DRB3 exon 2 polymorphism in tuberculosis infected cattle.** *Archiv für Tierzucht.* 1999. 42 (Special issue) p. 100-102. International Symposium: Candidate Genes for Animal Health, Rostock Warnemunde, Germany, 25-27 August, 1999. Note: Symposium proceedings. In English with a German summary.  
**NAL Call Number:** 49 AR23

**Descriptors:** tuberculosis, disease progress, polymorphism, interferon, alleles, antigens, Friesian cattle, disease resistance; RFLP, bacterial diseases, *Mycobacterium*, genetic effect on gamma IFN secretion, bovine lymphocyte antigen.

Melo, L.E.H.de; D' Angelino, J.L.; Castro, R.S.de; Schalch, U.M.; Pacheco, J.C.G.; Benatti, L.A.T.; Araujo, W.P.de; Pinheiro, S.R. **Prevalência de vacas reagentes a tuberculinização simultânea em rebanhos produtores de leite do tipo C do Estado de São Paulo.** [Prevalence of reactor cows to simultaneous tuberculin test in dairy herds from the State of São Paulo.] *Ciencia Veterinaria nos Tropicós.* 1999; 2(2): 91-99. ISSN: 1415-6326. Note: In Portuguese with an English summary.

**Descriptors:** bovine tuberculosis, *Mycobacterium bovis*, Zebu x Holstein cows, 21 dairy herds, intradermal testing, wide spread disease prevalence, São Paulo, Brazil.

Meyer, Robert M. **Erradicación de la Tuberculosis Bovina: Seminario de Actualización para Médicos Veterinarios.** [Eradication of Bovine Tuberculosis: Seminar of Response by Veterinarians.] [United States?], 1999. 50, [16] p. Note: In Spanish with an English summary.  
**NAL Call Number:** SF967.T8M4918 1999

**Descriptors:** tuberculosis, cattle, seminar, veterinary medicine, *Mycobacterium*.

Moka, G.; Berxholi, K.; Panariti, E.; Malaj, Z.; Biba, N.; Cabeli, P. **Metodi per la diagnosi di TBC bovina. [New methods for the diagnosis of bovine tuberculosis.]** *Selezione Veterinaria*. 1999. No. 10, 743-749. Note: In Italian with an English summary.

**NAL Call Number:** 241.71 B75

**Descriptors:** bovine tuberculosis, *Mycobacterium bovis*, cattle, gamma IFN test, diagnosis, test sensitivity, disease prevention and eradication, lesions.

Monies, R.J.; Head, J.C.S. **Bovine tuberculosis in housed calves.** *Veterinary Record*. 1999. 145 (25) 743. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** bovine tuberculosis, TB, dairy calves, lung lesions, infected cow, transmission, infected milk, etiology, *Mycobacterium bovis*, intercurrent bovine diarrhea virus, dairy farm, UK.

Montgomery, R.H. **Mycobacteria in New Zealand.** *Surveillance*. 1999. 2 (1) 6-8; 18.

**NAL Call Number:** SF604.63 N45S87

**Descriptors:** birds, possums, dogs, cats, rabbits, pigs, sheep, goats, deer, cattle, humans, *Mycobacterium* taxonomy, diagnosis, disease transmission, disease prevalence, disease control, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, Erinaceidae, *Mustela erminea*, *Mycobacterium avium*, *Mycobacterium paratuberculosis*, *Mycobacterium lepraemurium*, *Mycobacterium marinum*, *Mycobacterium kansasii*, New Zealand.

Morales-Alvarez, F. **Using a multiplex PCR to differentiate between M. bovis BCG-vaccinated and pathogenic M. bovis-infected goats.** *Tecnica Pecuaria en Mexico*. 2004; 42 (3): 419-428. ISSN: 0040-1889. Note: In English and Spanish.

**NAL Call Number:** 49 T222

**Descriptors:** goats, *Mycobacterium bovis*, multiplex PCR diagnostic tests, differentiating animals vaccinated with BCG and pathogenic *Mycobacterium bovis* infection, nasal mucus, blood and organ tissues, immune sensitization.

Munroe, F.A.; Dohoo, I.R.; Goodall, E.A. (ed.); Thursfield, M.V. **Estimating the incidence rate of within-herd spread of M.[Mycobacterium] bovis.** *Proceedings of a meeting held at the University of Bristol, UK, on the 24-26th March, 1999*. UK. Roslin, Society for Veterinary Epidemiology and Preventive Medicine 1999. p. 164-171.

**Descriptors:** *Mycobacterium*, humans, cattle herds, *Cervidae*, epidemiology, disease prevention, tuberculosis, disease transmission, zoonoses, disease surveys, outbreaks, sex, breeds, age, methodology, disease models, risk factors; disease prevalence, Canada.

Munroe, F.A.; Dohoo, I.R.; McNab, W.B.; Spangler, L. **Risk factors for the between-herd spread of Mycobacterium bovis in Canadian cattle and cervids between 1985 and 1994.** *Preventive Veterinary Medicine*. 1999. 41 (2-3) 119-133.

**NAL Call Number:** SF601 P7

**Descriptors:** cattle, cervids, tuberculosis outbreaks, *Mycobacterium bovis*, positive or negative herd analysis, outbreak records, logistic regression, spread of tuberculosis between herds, herd size, disease transmission, statistical analysis, Canada.

Neumann, G.B. **Bovine tuberculosis--an increasingly rare event.** *Australian Veterinary Journal*. July 1999. 77 (7) 445-446. ISSN: 0005-0423

**NAL call number:** 41.8 Au72

**Descriptors:** cattle, tuberculosis, *Mycobacterium bovis*, disease control, control programs, disease surveys, Australia.

Palmer, M.V.; Whipple, D.L.; Rhyan, J.C.; Bolin, C.A.; Saari, D.A. **Granuloma development in cattle after intratonsillar inoculation with Mycobacterium bovis.** *American Journal of Veterinary Research*. 1999. 60 (3) 310-315. ISSN: 0002-9645

**NAL Call Number:** 41.8 Am3A

**Descriptors:** crossbred cattle, cows, tuberculous lesions, temporal development, experimental infection, *Mycobacterium bovis*, intra-tonsillar injection, pathogenesis, fibrosis, giant cells, necrosis, granulomas, lymph nodes, lymphocytes, macrophages, neutrophils, plasma cells.

Pavlik, I.; Bartl, J.; Franta, V.; Matlova, L.; Dvorska, L.; Ayele, W.Y.; Bures, F.; Smolik, J.; Kostka, F. **Vyznam prikrmovani raseliny pri tvorbe tuberkuloznich zmen v miznich uzlinach prasat.** [The role of peat in the development of tuberculous lesions in porcine lymph nodes.] *Veterinarstvi*. 1999. 49 (11) 466-468. Note: In Czech with an English summary.

**NAL Call Number:** 41.8 V6439

**Descriptors:** pigs, *Mycobacterium*, *Mycobacterium intracellulare*, tuberculosis, peat litter, disease transmission, meat inspection, lymph nodes, Czech Republic.

Perumaalla, V.S.; Adams, L.G.; Payeur, J.; Baca, D.; Ficht, T.A. **Molecular fingerprinting confirms extensive cow-to-cow intra-herd transmission of a single *Mycobacterium bovis* strain.** *Veterinary Microbiology*. Dec 1999. 70 (3/4) 269-276. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Abstract:** In this study we have characterized *M. bovis* isolates from a herd of cattle in Uvalde, Texas in which 52 of the 193 animals selected at random in 1994 from a herd of 331 were caudal fold skin-test positive. Thirty-two of 52 skin-test positive cattle had gross lesions at slaughter, and isolations of *M. bovis* were made from 29 animals. The herd was comprised of Red Devon cattle purchased between 1978 and 1980 (n = 26) and breeding bulls (n = 3) introduced at later times, and all were tuberculosis test negative at the time of purchase. Other animals were natural additions (offspring) of these cattle. One additional animal, a Holstein present on the ranch at the time of purchase in 1976, was retained to nurse orphaned and weak calves. Using several molecular fingerprinting techniques we have verified a clonal relationship among the *M. bovis* isolates consistent with infection originating with a single strain. The molecular fingerprint patterns demonstrate the stability of the profiles despite persistence and spread of the organism within the herd for two decades and confirms their use in epidemiological tracing.

**Descriptors:** Red Devon cattle, *Mycobacterium bovis*, disease transmission, herds, DNA fingerprinting, chemical composition, tuberculosis, bacterial diseases, strain differences, skin testing, single strain, lesions, persistence, bulls, epidemiology, Texas.

Pinheiro, S.R. **Controle da tuberculose bovina versus tratamento.** [Control of bovine tuberculosis versus treatment.] *O Biologico*. 1999. 61 (2) 139-142. Note: In Portuguese.

**Descriptors:** cattle diseases, disease control, tuberculosis, cattle.

Rogers, L.M.; Delahay, R.J.; Cheeseman, C.L.; Smith, G.C.; Clifton-Hadley, R.S. **The increase in badger (*Meles meles*) density at Woodchester Park, south-west England: a review of the implications for disease (*Mycobacterium bovis*) prevalence.** *Mammalia*. 1999. 63 (2) 183-192. Note: In English with a French summary.

**NAL Call Number:** 410 M31

**Descriptors:** ecology, wild animals, intermediate hosts, disease reservoirs, disease prevalence, tuberculosis, *Mycobacterium bovis*, badgers, cattle, England, UK.

Romano, M.I.; Alito, A.; Zumarraga, M.J.; Bigi, F.; Cataldi, A. **Uso de sondas moleculares para la epidemiologia de la tuberculosis bovina.** [Use of molecular probes for epidemiological studies of bovine tuberculosis.] *Revista Argentina de Microbiologia*. 1999. 31 (Suppl. 1) 1-3. Note: Segundo taller internacional sobre infecciones humanas y animales producidas por chlamidias, micobacterias, brucelas y borrelias. Buenos Aires, 25 junio-4 julio 1997. In Spanish.

**Descriptors:** epidemiology, infections, *Mycobacterium tuberculosis*, mycobacterial diseases, DNA probes, cattle diseases.

Schettino, D.M.; Jorge, M.C.; Torres, P. **Tendencia de la situacion sanitaria de la tuberculosis en rodeos bovinos. Argentina, 1998.** [Status of the sanitary situation regarding tuberculosis in cattle. Argentina, 1998.] *Veterinaria Argentina*. 1999. 16 (156) 427-433. Note: In Spanish with an English summary.

**NAL Call Number:** SF604 V463

**Descriptors:** beef cattle, dairy cattle, prevalence, tuberculosis, PPD tuberculin, bacterial antigens, epidemiological surveys, *Mycobacterium*, Argentina.

Serraino, A.; Marchetti, G.; Sanguinetti, V.; Rossi, M.C.; Zanoni, R.G.; Catozzi, L.; Bandera, A.; Dini, W.; Mignone, W.; Franzetti, F. **Monitoring of transmission of tuberculosis between wild boars and cattle: genotypical analysis of strains by molecular epidemiology techniques.** *Journal of Clinical Microbiology*. Sept 1999. 37 (9) 2766-2771.

ISSN: 0095-1137

**NAL Call Number:** QR46.J6

**Descriptors:** cattle, wild boars, *Mycobacterium bovis*, DNA fingerprinting, restriction fragment length polymorphism, RFLP, disease transmission, Liguria.

Shamoon, G.N. **Isolation and diagnosis of mycobacteria species in ewes suffering from mastitis in Nineveh province.** *Iraqi Journal of Veterinary Sciences*. 1999. 12 (2) Ar97-Ar99. Note: In Arabic with an English summary.

**Descriptors:** diagnosis, sheep, ewes, mastitis, ewe milk, *Mycobacterium* strains, tuberculosis, disease surveys, *Mycobacterium avium* complex, *Mycobacterium bovis*, Iraq.

Silva, E.; Merlini, J.C.; de Kantor, I.N.; Bernardelli, A.; Robinson, A.; Nibot, C.; Gonzalez, N.; Regalado, L.; Alfonso, M.J.; Martinez, N. **Evaluacion de la tecnica de ELISA (sistema DAVIH-TBB) para el diagnostico de la tuberculosis bovina. [Evaluation of the ELISA technique (DAVIH-TBB system) for the diagnosis of bovine tuberculosis.]** *Revista de Medicina Veterinaria, Buenos Aires*. 1999. 80 (5) 361-363. Note: In Spanish with an English summary.

**NAL Call Number:** 41.8 B86

**Descriptors:** *Mycobacterium bovis*, tuberculosis, cattle, serum sampling, ELISA test, diagnostic techniques, lesions, purified protein derivative test, tuberculin, disease detection, herds, Cuba.

Silvestri, A. **La tubercolosi bovina tra inizio e fine secolo. [Tuberculosis in livestock in the twentieth century.]** *Atti della Societa Italiana di Buiatria*. 1999. 31: 79-89. Congresso Nazionale, Marina di Ragusa, Italy, June 1999. Note: In Italian with an English summary.

**Descriptors:** cattle tuberculosis, *Mycobacterium*, zoonotic diseases, diagnosis and treatment, prophylaxis, sanitation, hygiene, animal health.

Slobbe, L.; Lockhart, E.; O'Donnell, M.A.; Mackintosh, C.; de Lisle, G.; Buchan, G. **An in vivo comparison of bacillus Calmette-Guerin (BCG) and cytokine-secreting BCG vaccines [in red deer].** *Immunology*. 1999. 96 (4) 517-523.

**NAL Call Number:** 448.3 IM6

**Descriptors:** red deer, immunized, BCG (Pasteur 1173 P2 strain, recombinant BCG (rBCG/IL-2), immune responses, vaccines, intradermal skin test responses to BCG antigens, lymphocyte transformation, shuttle plasmid, *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain.

Suppiger, F. **Die Tierseuchenbekämpfung in der Schweiz von 1896 bis 1996, insbesondere im Kanton Luzern. [Control of animal epidemic diseases in Switzerland between 1896 and 1996 with particular emphasis on the situation in the Canton of Lucerne.]** *Schweizer Archiv für Tierheilkunde*. 1999. 141 (1) 11-20. Note: In German.

**NAL Call Number:** 41.8 SCH9

**Descriptors:** horses, pigs, cattle, disease prevention and control, domestic animals, infectious diseases, bacterial diseases, tuberculosis, brucellosis, bovine leucosis, swine fever, veterinary history, BSE, bovine spongiform encephalopathy, *Mycobacterium*, Switzerland.

Sutmoller, P. **Risk of disease transmission by llama embryos.** *Revue Scientifique et Technique Office International des Epizooties*. 1999. 18 (3) 719-728. Note: In English with French and Spanish summaries.

**NAL Call Number:** SF781 R4

**Descriptors:** disease transmission risks, embryos, brucellosis, contamination, embryo transfer, FMD, risk assessment, tuberculosis, zona pellucida, arboviruses, bacterial diseases, viral diseases, Bluetongue virus, *Brucella*, *Mycobacterium*, vesicular stomatitis virus, llamas.

Tonoli, N. **Tubercolosi nel suino: esperienza in un macello industriale della Lombardia. [Tuberculosis in pigs: experience in an industrial abattoir in Lombardy.]** *Praxis Veterinaria Milano*. 1999. 20 (3) 11-14. Note: In Italian with an English summary.

**Descriptors:** pigs, *Mycobacterium avium*, lesions, liver, lungs, lymph nodes, pleura, spleen, mycobacterial diseases, postmortem examinations, symptoms, swine diseases, Italy.

UK, British Small Animal Veterinary Association Scientific Committee. **Scientific information document: tuberculosis.** *Journal of Small Animal Practice*. 1999. 40 (3) 145-147.

**NAL Call Number:** 41.8 J8292

**Descriptors:** cattle, reptiles, fishes, amphibians, humans, cats, dogs, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium avium*, tuberculosis, zoonoses, pathogenesis, treatment, diagnosis, radiography, histopathology, reviews.

Vela, A.I.; las Heras, A.; de Juan, L.; Aranaz, A.; Mateos, A.; Dominguez, L.; de Juan, L. **El problema de erradicar la tuberculosis bovina. [The problem of eradicating bovine tuberculosis.]** *Mundo Ganadero*. 1999. 10 (115) 48, 50, 52, 54-55. Note: In Spanish.

**Descriptors:** *Mycobacterium bovis*, epidemiology, diagnosis, control, disease control, livestock, tuberculosis, current disease levels, Spain.

Vetesi, F. **A szeres legzszervi betegsegei Patologiai vonatkozások. [Pathological aspects of selected swine respiratory disorders.]** *Magyar Allatorvosok Lapja*. 1999. 121 (8) 467-475. Note: In Hungarian with an English summary.

**NAL Call Number:** 41.8 V644

**Descriptors:** pigs, various diseases including tuberculosis, pathogenesis, physiopathology, mixed infections, immune responses, immune systems, lungs, bacterial diseases, parasitic diseases, pasterurellosis, viruses.

Vordermeier, H.M.; Cockle, P.C.; Whelan, A.; Rhodes, S.; Palmer, N.; Bakker, D.; Hewinson, R.G. **Development of diagnostic reagents to differentiate between *Mycobacterium bovis* BCG vaccination and *M. bovis* infection in cattle.** *Clinical and Diagnostic Laboratory Immunology*. 1999. 6 (5) 675-682.

**Descriptors:** recombinant forms of antigens, BCG Pasteur (ESAT-6, MPB64, MPB70, MPB83), testing, *Mycobacterium bovis*, calf mononuclear cells, sensitized animals, *M. bovis* infected, BCG vaccinated, *M. avium* sensitized, in vitro proliferation and gamma interferon responses, peptide and protein cocktails formulations, T cell epitopes.

Webber, W. (ed.); Budge, G. *Proceedings of the 29th Seminar of the Society of Sheep and Beef Cattle Veterinarians NZVA, 1-3 March 1999, Angus Inn Hotel, Hastings, New Zealand. Publication - Veterinary Continuing Education, Massey University*. 1999. No. 189, vi and 186 pp. Note: A conference proceeding of 32 papers, sheep and cattle, a variety of diseases and deficiencies, toxicities, tuberculosis testing, meat safety.

**NAL Call Number:** SF604 P82

**Descriptors:** beef cattle, sheep, public health, veterinarians, abortion, poisonous plants, deficiency diseases, vitamin B12, cobalt, public health, meat quality, meat hygiene, nitrates, fertilizers, zoonotic diseases, calcium and magnesium levels, tuberculosis, *Mycobacterium*, *Salmonella*, *Bacillus*, *Campylobacter*, *Neospora*, New Zealand.

Wedlock, D.N.; Aldwell, F.E.; Collins, D.M.; de Lisle, G.W.; Wilson, T.; Buddle, B.M. **Immune responses induced in cattle by virulent and attenuated *Mycobacterium bovis* strains: correlation of delayed-type hypersensitivity with ability of strains to grow in macrophages.** *Infection and Immunity*. May 1999. 67 (5) 2172-2177. ISSN: 0019-9567

**NAL Call Number:** QR1.I57

**Abstract:** Comparison of immune responses induced in cattle by virulent and attenuated strains of *Mycobacterium bovis* will assist in identifying responses associated with resistance or susceptibility to disease. Four strains of *M. bovis*, one which is virulent in guinea pigs (WAg201) and three which are attenuated in guinea pigs (an isoniazid-resistant strain [WAg405], ATCC 35721, and BCG) were compared for their abilities to induce immune responses in cattle and to grow in bovine lung alveolar macrophage cultures. Extensive macroscopic lesions were found only in cattle inoculated with the virulent *M. bovis* strain. Strong antibody responses to *M. bovis* culture filtrate, as well as persistently high levels of gamma interferon and interleukin-2 released from purified protein derivative (PPD)-stimulated peripheral blood lymphocyte cultures, were observed in the cattle inoculated with the virulent strain compared to those inoculated with the attenuated strains. All cattle inoculated with the virulent strain or two of the attenuated strains (WAg405 and ATCC 35721) elicited strong delayed-type hypersensitivity responses to PPD in skin tests, while animals inoculated with BCG induced only a weak response. The three strains which produced strong skin test responses proliferated well in bovine alveolar macrophages and induced high levels of proinflammatory cytokine mRNAs compared to BCG. Our study showed that skin test responsiveness to PPD correlated with the ability of the strains to grow in alveolar macrophages rather than to their pathogenicity in cattle.

**Descriptors:** tuberculosis, *Mycobacterium*, antibody formation, interleukin 2, cattle, immune responses, strain responses, skin tests responsiveness to PPD, alveolar macrophages, pathogenicity in cattle.

Woodroffe, R.; Frost, S.D.W.; Clifton-Hadley, R.S. **Attempts to control tuberculosis in cattle by removing infected badgers: constraints imposed by live test sensitivity.** *Journal of Applied Ecology*. 1999. 36 (4) 494-501.

**NAL Call Number:** 410 J828

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculosis, culling badgers, *Meles meles*, disease transmission, wildlife disease reservoirs, disease control, serology, immunodiagnosis, wild animals, control, identifying infected animals for removal, UK.

## 1998

Acosta, B.; Real, F.; Ferrer, O.; Deniz, S.; Poveda, J.B. **Isolation of *Mycobacterium kansasii* from a tuberculin-positive goat.** *Veterinary Record*. Feb 21, 1998. 142 (8) 195-196. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** goats, *Mycobacterium kansasii*, lymph nodes, isolation, lesions, tuberculosis, case reports.

Addo, K.K.; Kapitancik, B.; Velebny, S.; Hrcakova, G.; Mattova, J.; Dubinsky, P. **The experimental immunization of cattle against tuberculosis by liposomized BCG vaccine.** *Folia Veterinaria*. 1998. 42 (3) 153-157.

**NAL Call Number:** 41.8 F712

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain, tuberculosis, BCG vaccine, liposomes, immunization, live vaccines, experimental infection, calves.

Alves-Junior, M.; dos Santos, P.C.G.; Paleari, J.P.; Russomano, M. **Carcinoma de perolas corneas da regio frontal de bovino associado a tuberculose pulmonar do tipo nodular multipla. [Frontal corneal carcinoma in a bull associated with multiple nodular type pulmonary tuberculosis.]** *UNIMAR Ciencias*. 1998. 7 (2) 189-192. Note: In Portuguese with an English summary.

**Descriptors:** case report, cattle, bull, cornea neoplasms, nodular-type pulmonary tuberculosis, *Mycobacterium*, Brazil.

Amadori, M.; Tameni, S.; Scaccaglia, P.; Cavirani, S.; Archetti, I.L.; Giandomenico, R.Q. **Antibody tests for identification of *Mycobacterium bovis*-infected bovine herds.** *Journal of Clinical Microbiology*. 1998. 36 (2) 566-568.

**NAL Call Number:** QR46.J6

**Descriptors:** cattle, ELISA, *Mycobacterium bovis*, tuberculosis, serum sampling, diagnosis, antibodies, ELISA, tuberculosis, Italy.

Anonymous. **A challenging task on TB.** *Veterinary Record*. Mar 14, 1998. 142 (11) 257. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** tuberculosis, badgers, *Meles meles*, cattle, disease control.

Anonymous. **No quick fix on TB.** *Veterinary Record*. Jan 3, 1998. 142 (1) 1. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, tuberculosis, *Mycobacterium bovis*, badgers, *Meles meles*, disease control, UK.

Antognoli, M.C.; Pereira, J.J.; Rodriguez, F.; Garbaccio, S. **Tuberculosis bovina en guachera. [Bovine tuberculosis on a dairy farm.]** *Veterinaria Argentina*. 1998. 15 (149) 631-636. Note: In Spanish with an English summary.

**NAL Call Number:** SF604 V463

**Descriptors:** dairy farm, calves, intradermal testing, tuberculosis disease outbreak, disease transmission, *Mycobacterium*, feeding of unpasteurized milk, Argentina.

Atallah, S.T.; El Kak, A.A. **Economic loss due to infection of cattle and buffaloes with tuberculosis and brucellosis.** *Alexandria Journal of Agricultural Research*. 1998. 43 (3) 367-376. Note: In English with an Arabic summary.

**NAL Call Number:** 24 AL2

**Descriptors:** *Mycobacterium bovis*, *Brucella*, tuberculosis, disease prevalence, carcass condemnation, breed differences in susceptibility, losses, crossbreds, buffalo, cattle breeds, economic losses, Egypt.

Barlow, N.D.; Kean, J.M.; Caldwell, N.P.; Ryan, T.J. **Modelling the regional dynamics and management of bovine tuberculosis in New Zealand cattle herds.** *Preventive Veterinary Medicine*. 1998. 36 (1) 25-38.

**NAL Call Number:** SF601 P7

**Descriptors:** tuberculosis, disease control, models, transport of animals, wild animals, disease transmission, statistical analysis, *Mycobacterium bovis*, cattle, Waikato region, herd-to-herd transmission, New Zealand.

Benet, J.J. **Surveillance des evenements rares: la tuberculose bovine en France. [Surveillance of rare health events: example of bovine tuberculosis in France.]** *Epidemiologie et Sante Animale*. 1998. No. 34, 47-55. Note: In French with an English summary.

**Descriptors:** cattle, tuberculosis, skin tests, disease survey, risk factors, France.

Benkirane, A. **Bovine tuberculosis in Africa.** *World Animal Review*. 1998. No. 90, 54-56. Note in English with French and Spanish summaries.

**NAL Call Number:** SF191 W6

**Descriptors:** cattle, *Mycobacterium tuberculosis*, epidemiology, disease prevention and control, diagnosis, zoonoses, Africa.

Bisping, W. **Zur Geschichte der Bekämpfung der Rindertuberculose - Beitrage aus dem Institut fur Mikrobiologie und Tierseuchen der Tierarztlichen Hochschule Hannover. [History of control measures against bovine tuberculosis - contributions from the Institute of Microbiology and Contagious Diseases, Veterinary School Hannover.]** *Berliner und Munchener Tierarztliche Wochenschrift*. 1998. 111 (10) 362-367. Note: In German with an English summary.

**NAL Call Number:** 41.8 B45

**Descriptors:** cattle, veterinary history, disease control, tuberculosis, Germany.

Bollo, E.; Guarda, F.; Capucchio, M.T.; Galietti, F. **Direct detection of *Mycobacterium tuberculosis* complex and *M. avium* complex in tissue specimens from cattle through identification of specific rRNA sequences.** *Journal of Veterinary Medicine. Series B*. Sept 1998. 45 (7) 395-400. ISSN: 0931-1793

**NAL Call Number:** 41.8 Z52

**Descriptors:** cattle, *Mycobacterium avium*, *Mycobacterium tuberculosis*, detection, diagnostic techniques, diagnosis, ribosomal RNA, identification, evaluation, clinical aspects.

Brown, W.H.; de Anda, J.H. **Tuberculosis in adult beef cattle of Mexican origin shipped direct-to-slaughter into Texas.** *Journal of the American Veterinary Medical Association*. Feb 15, 1998. 212 (4) 557-559. ISSN: 0003-1488

**NAL Call Number:** 41.8 Am3

**Descriptors:** beef cattle, tuberculosis, *Mycobacterium bovis*, disease prevalence, geographical variation, exports, risk, disease control, Mexico, Texas.

Caley, P.; Spencer, N.J.; Cole, R.A.; Efford, M.G. **The effect of manipulating population density on the probability of den-sharing among common brushtail possums, and the implications for transmission of bovine tuberculosis.** *Wildlife Research*. 1998. 25 (4) 383-392.

**NAL Call Number:** S960 W5

**Descriptors:** cattle, brushtail possums, *Trichosurus vulpecula*, population density, disease transmission, *Mycobacterium bovis*, tuberculosis, wild animals, populations, New Zealand.

Carpenter, E.; Fray, L.; Gormley, E. **Antigen-specific lymphocytes enhance nitric oxide production in *Mycobacterium bovis* BCG-infected bovine macrophages.** *Immunology and Cell Biology*. 1998. 76 (4) 363-368.

**NAL Call Number:** QR180 I43

**Descriptors:** cattle, immunization, nitric oxide, NO, macrophages, immunity, lymphocytes, interferon, cell mediated immunity, immune response, vaccination, *Mycobacterium bovis*, *Mycobacterium bovis* BCG, tuberculosis, recombinant bovine interferon (IFN)-gamma.

Cassidy, J.P.; Bryson, D.G.; Pollock, J.M.; Evans, R.T.; Forster, F.; Neill, S.D. **Early lesion formation in cattle experimentally infected with *Mycobacterium bovis*.** *Journal of Comparative Pathology*. 1998. 119 (1) 27-44. ISSN: 0021-9975

**NAL Call Number:** 41.8 J82

**Descriptors:** cattle, *Mycobacterium bovis*, experimental infections, intranasal inoculation, respiratory tract lesions, retropharyngeal lymph nodes, caudal lung lobe, immunopathology, neutrophils, cell mediated immunity, tuberculosis.

Chaddock, H.M. **Northeast Michigan surveillance activities for bovine tuberculosis in the livestock and free-ranging deer populations.** *Proceedings One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October, 1998. United States Animal Health Association; Richmond; USA. 1998. p. 660-686.*

**NAL Call Number:** 49.9 UN3R

**Descriptors:** free-ranging deer, livestock, disease transmission, surveillance, tuberculosis, overcrowding effects, public health, food safety, wildlife as disease reservoirs, disease control, reviews, Michigan.

Converse, P.J.; Dannenberg, A.M. Jr.; Shigenaga, T.; McMurray, D.N.; Phalen, S.W.; Stanford, J.L.; Rook, G.A.W.; Koru-Sengul, T.; Abbey, H.; Estep, J.E.; Pitt, M.L.M. **Pulmonary bovine-type tuberculosis in rabbits: bacillary virulence, inhaled dose effects, tuberculin sensitivity, and *Mycobacterium vaccae* immunotherapy.** *Clinical and Diagnostic Laboratory Immunology.* 1998. 5 (6) 871-881.

**Descriptors:** *Mycobacterium vaccae*, rabbit pulmonary tuberculosis, immunology factors, virulence, effects, tuberculin, immunotherapy, live vaccines.

Costello, E.; Doherty, M.L.; Monaghan, M.L.; Quigley, F.C.; O'Reilly, P.F. **A study of cattle-to-cattle transmission of *Mycobacterium bovis* infection.** *Veterinary Journal.* May 1998. 155 (3) 245-250. ISSN: 1090-0233

**NAL Call Number:** SF601.V484

**Abstract:** Twenty steers, positive to the single intradermal comparative tuberculin test (SICTT), were selected from herds with a recent history of *Mycobacterium bovis* infection. Ten steers, negative to SICTT, were selected from herds with no history of *M. bovis* infection and served as in-contact animals. The animals were divided into 10 groups, each consisting of two SICTT-positive (reactor) animals and one in-contact animal. Each group was housed in an individual loose-box for a period of 1 year. Five of the groups were fed a restricted diet for part of the experiment. All cattle were slaughtered at the end of the study period and examined at post mortem. Transmission of infection to an in-contact animal occurred in four of the 10 groups. One of the four in-contact animals, which became infected, had a retropharyngeal lymph node tubercle and *M. bovis* was isolated from lymph nodes without visible lesions from the other three. Two of the infected in-contact animals without visible lesions did not show any detectable cell-mediated immune response. There was no evidence that dietary restriction had any effect on transmission of disease.

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculosis, disease transmission, nutritional state, plane of nutrition, restricted feeding, loose housing.

De Lisle, G.W.; Yates, G.F.; Joyce, M.A.; Cavaignac, S.M.; Hynes, T.J.; Collins, D.M. **Case report and DNA characterization of *Mycobacterium avium* isolates from multiple animals with lesions in a beef cattle herd.** *Journal of Veterinary Diagnostic Investigation.* 1998. 10 (3) 283-284.

**NAL Call Number:** SF774 J68

**Descriptors:** *Mycobacterium bovis*, beef cattle, *Mycobacterium avium* complex, brushtail possums, herd monitoring, mesenteric lesions, post mortem examination, DNA restriction pattern, characterization, differential diagnosis, tuberculosis, New Zealand.

Delahay, R.J.; Cheeseman, C.L.; Mallinson, P.J.; Rogers, L.M.; Smith, G.C. **Badgers and bovine tuberculosis: a review of studies in the ecology of a wildlife disease reservoir.** *Cattle Practice.* 1998. 6 (2) 83-87.

**NAL Call Number:** SF961 C37

**Descriptors:** *Mycobacterium bovis*, cattle, badgers, *Meles meles*, tuberculosis, wild animals as disease reservoirs, disease transmission, epidemiology.

Finlay, S. **Krebs - one year on from recommendations towards a sustainable policy to control TB in cattle.** *State Veterinary Journal.* 1998. 8 (4) 12-14.

**NAL Call Number:** SF601 S8

**Descriptors:** cattle, badgers, *Meles meles*, tuberculosis, *Mycobacterium*, disease prevention and control, wildlife disease reservoirs, vaccines, culling diseased animals.

Frost, B. **Research update on diagnostic tests for tuberculosis in llamas/alpacas.** *Proceedings One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October,*

1998. United States Animal Health Association; Richmond; USA. 1998. p. 726-727.

**NAL Call Number:** 49.9 UN3R

**Descriptors:** *Mycobacterium bovis*, diagnostic tests, tuberculosis, llamas, alpacas.

Gonzalez-Llamazares, O.R.; Gutierrez-Martin, C.B.; Rodriguez-Ferri, E.F. **Etiologia y diagnostico de la tuberculosis bovina. [Aetiology and diagnosis of bovine tuberculosis.]** *Medicina Veterinaria*. 1998. 15 (10) 514-537; 221. Note: In Spanish with an English summary.

**NAL Call Number:** SF604 A765

**Descriptors:** cattle, etiology, diagnosis, bovine tuberculosis, *Mycobacterium*, Spain.

Griffin, F.; Bissett, B.; Rodgers, C.; Mackintosh, C. **Uncontrollable spread of TB within a deer herd.** *Proceedings of a Deer Course for Veterinarians*. 1998. No. 15, 227-231.

**Descriptors:** *Mycobacterium*, red deer, *Cervus elaphus*, tuberculosis, current disease incidence, UK.

Griffin, J.F.T.; Mackintosh, C.G.; Slobbe, L.; Thomson, A.J.; Buchan, G.S. **Vaccine protocols to optimise the protective efficacy of BCG [in red deer].** *Tubercle and Lung Disease*. 1998. 79 (3) 135-143.

**Descriptors:** red deer, *Cervus elaphus*, experimental infection, efficacy of BCG vaccination, intra-tonsillar injection, virulent *Mycobacterium bovis*, *Mybacterium bovis* BCG strain, pathogenesis, various vaccination doses, routes of vaccination, viability of vaccine, vaccine carriers, adjuvants, delayed high sensitivity, skin tests, post mortem examinations, New Zealand.

Gripper, J. **An open letter to Nick Brown, Minister of Agriculture... [Tuberculosis in cattle and badgers in the UK].** *Veterinary Times*. 1998. 28 (10) 4-6.

**Descriptors:** cattle, badgers, *Meles meles*, *Mycobacterium*, tuberculosis, disease prevalence and control, disease transmission, wild animals, UK.

Gutierrez, M.; Tellechea, J.; Garcia-Marin, J.F. **Evaluation of cellular and serological diagnostic tests for the detection of *Mycobacterium bovis*-infected goats.** *Veterinary Microbiology*. 1998. 62 (4) 281-290.

**NAL Call Number:** SF601 V44

**Descriptors:** *Mycobacterium bovis*, goats, tuberculosis, ELISA based diagnostic tests, disease, detection, tuberculin, IFN-gamma assay, blood, serum, interferon, assays, immunological techniques.

Hernandez, J.; Baca, D. **Effect of tuberculosis on milk production in dairy cows.** *Journal of the American Veterinary Medical Association*. Sept 15, 1998. 213 (6) 851-854. ISSN: 0003-1488

**NAL Call Number:** 41.8 Am3

**Descriptors:** dairy cows, tuberculosis, *Mycobacterium bovis*, milk production, losses, dairy herds, tuberculin, tests.

Kovacic, H.; Cvetnic, Z.; Majnaric, D.; Krznaric, M.; Tomac, A.; Separovic, S.; Balenovic, T. **Stanje tuberkuloze u goveda od 1992. do 1997 godine u Hrvatskoj. [The occurrence of tuberculosis in cattle in Croatia from 1992 to 1997.]** *Zbornik Radova. Hrvatska veterinarska komora; Zagreb, Croatia* 1998. p. 117-122. Note: Veterinarski dani 1998. Rovinj, Croatia, 13-17 October 1998. In Croatia with an English summary.

**Descriptors:** tuberculosis, *Mycobacterium*, cattle, incidence of disease, disease diagnosis.

Krebs, J.R.; Anderson, R.M.; Clutton-Brock, T.; Donnely, C.A.; Frost, S.; Morrison, W.I.; Woodroffe, R.; Young, D. **Badgers and bovine TB: conflicts between conservation and health.** *Science*. Feb 6, 1998. 279 (5352) 817-818. ISSN: 0036-8075

**NAL Call Number:** 470 Sci2

**Descriptors:** cattle, Badgers, *Meles meles*, *Mycobacterium*, tuberculosis, disease transmission, male animals, disease control, Great Britain.

Krebs, J.R. **Bovine tuberculosis in cattle and badgers.** *State Veterinary Journal*. 1998. 8 (1) 1-3.

**NAL Call Number:** SF601 S8

**Descriptors:** cattle, *Mycobacterium bovis*, badgers, *Meles meles*, tuberculosis, UK.

Kumar, G.S.; Sharma, A.K.; Iyer, P.K.R.; Prasad, M.C. **Tuberculosis in crossbred dairy cattle.** *Indian Journal of Veterinary Pathology*. 1998. 22 (1) 11-15.

**NAL Call Number:** SF769 A1I48

**Descriptors:** cattle, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, *Mycobacterium chelonae*, tuberculosis, diagnosis, lungs and associated lymph nodes, mortality, disease prevalence, isolation, Uttar Pradesh, India.

Kumar, G.S.; Parihar, N.S. **Haemato-biochemical picture in buffaloes induced with *Mycobacterium bovis*.** *Indian Journal of Animal Sciences*. 1998. 68 (9) 923-924.

**NAL Call Number:** 41.8 IN22

**Descriptors:** buffalo, *Mycobacterium bovis*, hematology, blood chemistry profile, tuberculosis, India.

Kumar, G.S.; Parihar, N.S. **Isolation of mycobacteria from suspected cases of pulmonary tuberculosis in buffaloes slaughtered for food.** *Indian Journal of Animal Sciences*. 1998. 68 (6) 555-556.

**NAL Call Number:** 41.8 IN22

**Descriptors:** food safety, buffalo meat, epidemiology, histopathology, disease incidence, isolation, lesions, lungs, lymph nodes, tuberculosis, zoonoses, buffalo, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, Uttar Pradesh, India.

Kumar, G.S.; Parihar, N.S. **Respiratory ailments in Indian buffaloes.** *Buffalo Journal*. 1998. 14 (1) 109-114.

**Descriptors:** lungs mediastinal lymph nodes, post slaughter tissue, pneumonia, lesions, disease surveys, *Mycobacterium*, neoplasms, tuberculosis, fascioliasis, disease prevalence, epidemiology, metacestodes, parasites, helminthes, buffaloes, Uttar Pradesh, India.

Liebana, E.; Aranaz, A.; Urquia, J.J.; Mateos, A.; Dominguez, L. **Evaluation of the gamma-interferon assay for eradication of tuberculosis in a goat herd.** *Australian Veterinary Journal*. Jan 1998. 76 (1) 50-53. ISSN: 0005-0423

**NAL Call Number:** 41.8 Au72

**Descriptors:** goats, kids, *Mycobacterium bovis*, tuberculosis, interferon, assays, diagnostic techniques, skin tests, tuberculin, disease control, flocks, diagnostic value.

Lightbody, K.A.; Skuce, R.A.; Neill, S.D.; Pollock, J.M. **Mycobacterial antigen-specific antibody responses in bovine tuberculosis: an ELISA with potential to confirm disease status.** *Veterinary Record*. Mar 21, 1998. 142 (12) 295-300. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** *Mycobacterium bovis*, tuberculosis, ELISA, bacterial antigens, recombinant proteins, immune response, IgG, skin tests.

Lilenbaum, W.; Schettini, J.; Ribeiro, E.R.; de Souza, G.N.; Moreira, E.C.; Fonseca. **Tuberculose bovina: prevalencia e estudo epidemiologico em treze propriedades de diferentes sistemas de producao na regio dos lagos do Estado do Rio de Janeiro. [Bovine tuberculosis: prevalence and epidemiology on 13 farms in the lakes region of Rio de Janeiro State, Brazil.]** *Revista Brasileira de Medicina Veterinaria*. 1998. 20 (3) 120-123. Note: In Portuguese with an English summary.

**NAL Call Number:** SF604 R38

**Descriptors:** cattle, *Mycobacterium bovis*, 13 farms, intradermal skin test, disease prevalence of TB, differences related to farming system, Brazil.

Lis, H. **Ocena wystepowania i zwalczania gruzlicy bydla w Polsce. [Epidemiology of bovine tuberculosis in Poland.]** *Medycyna Weterynaryjna*. 1998. 54 (9) 611-614. Note: In Polish with an English summary.

**NAL Call Number:** 41.8 M463

**Descriptors:** cattle, disease prevalence, disease surveys, diagnosis, bovine tuberculosis, *Mycobacterium*, bacterial diseases; cattle diseases, Poland

Lis, H. **Ocena wynikow badania sanitarno-weterynaryjnego swin rzezynych w Polsce w 1994r. [Inspection of pigs slaughtered in Poland in 1994.]** *Medycyna Weterynaryjna*. 1998. 54 (6) 417-420. Note: In Polish with an English summary.

**NAL Call Number:** 41.8 M463

**Descriptors:** pigs, ante- and post-mortem examination, condemned carcasses, abscesses, echinococcosis, parasitoses, *Mycobacterium tuberculosis*, emaciation, *Trichinella spiralis*, trichinellosis, Poland.

Lugton, I.W.; Wilson, P.R.; Morris, R.S.; Nugent, G. **Epidemiology and pathogenesis of *Mycobacterium bovis***

**infection of red deer (*Cervus elaphus*) in New Zealand.** *New Zealand Veterinary Journal*. 1998. 46 (4) 147-156.

**NAL Call Number:** 41.8 N483

**Descriptors:** tuberculosis, epidemiology, pathogenesis, disease prevalence, diagnosis, detection, red deer, *Cervus elaphus*, wild animals, *Mycobacterium bovis*, New Zealand.

Lyashchenko, K.P.; Pollock, J.M.; Colangeli, R.; Gennaro, M.L. **Diversity of antigen recognition by serum antibodies in experimental bovine tuberculosis.** *Infection and Immunity*. Nov 1998. 66 (11) 5344-5349. ISSN: 0019-9567

**NAL Call Number:** QR1.I57

**Abstract:** Tuberculosis in cattle remains a major zoonotic and economic problem in many countries. The standard diagnostic assay for bovine tuberculosis, the intradermal tuberculin test, has low accuracy. Therefore, alternative immunodiagnostic methods, such as serological assays, are needed for detection of infected animals. Development of an accurate serodiagnostic test requires a detailed understanding of the humoral immune responses during bovine tuberculosis and, in particular, identification of the key antigens of *Mycobacterium bovis* involved in antibody production. In this study, we characterized antibody responses in cattle experimentally infected with *M. bovis*. Sequential serum samples were collected every 3 to 4 weeks for up to 27 months postinfection. Circulating immunoglobulin G antibody levels were measured by an enzyme-linked immunosorbent assay using 12 highly purified recombinant proteins of *M. bovis*. Six proteins, ESAT-6, 14-kDa protein, MPT63, MPT70, MPT51, and MPT32, were identified as major seroreactive antigens in bovine tuberculosis. A remarkable animal-to-animal variation of antigen recognition by serum antibodies was observed. Kinetic analyses of the antibody production to individual antigens during infection revealed that the heterogeneous antigen recognition profile changed markedly in a given infected animal as disease progressed.

**Descriptors:** antibody formation, experimental infections, *Mycobacteriu bovis*, antigen antibody reactions, IGG.

Mackereth, G.; Jackson, R. **Spatial data and TB management.** *Publication - Veterinary Continuing Education, Massey University*. 1998. No. 188, 19-25. Combined state and epidemiology and health management. Note: 75th Jubilee NZVA Conference 1998. 29 June to 2 July 1998. Rotorua Convention Centre, New Zealand.

**NAL Call Number:** SF604 P82

**Descriptors:** *Mycobacterium tuberculosis*, cattle, tuberculosis, zoonoses, disease control, epidemiology, disease surveys, geographical information systems.

Mahato, G.; Rahman, H.; Sharma, K.K.; Pathak, S.C. **Tuberculin testing in captive Indian elephants (*Elephas maximus*) of a national park.** *Indian Journal of Comparative Microbiology, Immunology and Infectious Diseases*. 1998. 19 (1) 63.

**Descriptors:** elephants, *Elephas maximus*, zoo animals, tuberculin testing, tuberculosis, *Mycobacterium*, diagnostic techniques, diagnosis, India.

Mairtin, D.O.; Williams, D.H.; Dolan, L.; Eves, J.A.; Collins, J.D. **The influence of selected herd factors and a badger-intervention tuberculosis-control programme on the risk of a herd-level trade restriction to a bovine population in Ireland.** *Preventive Veterinary Medicine*. 1998. 35 (2) 79-90.

**NAL Call Number:** SF601 P7

**Descriptors:** cattle, tuberculin skin test, post slaughter testing, disease risks, Cox proportional hazard model, herd-level trade restriction, badger control program, wild animal disease reservoir, *Mycobacterium bovis*, Ireland.

McGinness, Stephen. **Bovine tuberculosis.** *Research paper (Great Britain. Parliament. House of Commons. Library)*; 98/63. [London?], House of Commons Library, [1998]

**URL:** <http://www.parliament.uk/commons/lib/research/rp98/rp98-063.pdf>

**NAL Call Number:** SF967.T8 M34 1998

**Descriptors:** tuberculosis in cattle, transmission, incidence, prevention and control, *Mycobacterium*, Great Britain.

McGraw, L. **Diagnostic test for cattle tuberculosis.** *Agricultural Research*. Sept 1998. 46 (9) 17. ISSN: 0002-161X

**URL:** <http://www.ars.usda.gov/is/AR/>

**NAL Call Number:** 1.98 Ag84

**Descriptors:** *Mycobacterium bovis*, tuberculosis, diagnostic techniques, polymerase chain reaction.

Morishita, T.Y.; Fullerton, A.T.; Lowenstine, L.J.; Gardner, I.A.; Brooks, D.L. **Morbidity and mortality in free-living**

**raptorial birds of Northern California: a retrospective study, 1983-1994.** *Journal of Avian Medicine and Surgery.* 1998. 12 (2) 78-81.

**NAL Call Number:** SF994 J6

**Descriptors:** owls, hawks, free-living raptors, mortality, morbidity, pathology, nutritional state, aspergillosis, *Escherichia*-infections, diagnosis, clinical aspects, nutritional disorders, causes of death, trauma and injuries, tuberculosis, *Mycobacterium*, avian cholera, fractures, underlying diseases, California.

Morris, C.A. **Genetics of disease resistance in *Bos taurus* cattle.** *Animal Genetic Resources Information.* 1998. No. 23, 1-11. Note: In English with a Spanish summary.

**Descriptors:** cattle, genetic variation, disease susceptibility, genetics, many diseases considered, parasites, mycotoxins, FMD, brucellosis, BSE, *Mycobacterium*, 25 year divergent selection experiment for pasture bloat, heritability estimates, New Zealand, Australia.

Morrison, W.I. **Bovine tuberculosis: unresolved questions and future approaches to control.** *Cattle Practice.* 1998. 6 (2) 75-77.

**NAL Call Number:** SF961 C37

**Descriptors:** cattle, badgers, *Mycobacterium bovis*, *Meles meles*, disease transmission and control, vaccination, England.

Nagy, G. **A gamma-interferon-termelés kimutatása gumokorral fertőzött és paraallergiás reakciókat mutató szarvasmarha-allományokban. Elosztás közlemény. [Detection of gamma-interferon production in cattle herds with tuberculosis or giving positive para-allergic reactions. Preliminary communication.]** *Magyar Allatorvosok Lapja.* 1998. 120 (12) 711-713. Note: In Hungarian with an English summary.

**NAL Call Number:** 41.8 V644

**Descriptors:** cattle, *Mycobacterium paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium avium*, tuberculosis, interferon, diagnosis, tuberculin, sandwich ELISA, gamma IF, fresh blood cultures with bovine or avian PPD, Hungary.

O'Keeffe, J.J.; Crowley, M.J. **Tuberculosis in cattle: classifying breakdown episodes as a basis for decision making in eradication programmes.** *Proceedings of a Meeting, Society for Veterinary Epidemiology and Preventive Medicine.* [Great Britain]. 1998. p. 28-37. ISSN: 0956-7496. Note: Meeting held on March 25-27, 1998, Ennis.

**NAL Call Number:** SF780.9.S63

**Descriptors:** cattle, *Mycobacterium tuberculosis*, prevention, control, eradication, government programs.

Ortatatli, M.; Ciftci, M.K.; Tuzcu, M. **Sigirlarda tuberkuloz ve diğer granulomatoz pnömoniler Üzerinde patolojik incelemeler. [Pathologic investigations on tuberculosis and other granulomatous pneumonia in cattle.]** *Veteriner Bilimleri Dergisi.* 1998. 14 (2) 139-150. Note: In Turkish with an English summary.

**Descriptors:** cattle, lungs, mediastinal-bronchial lymph nodes, slaughter houses, granulomatous pneumonia, disease survey, tuberculosis, actinobacillosis, pneumomycosis, food safety, histopathology, *Mycobacterium*, Turkey.

Petukhov, V.L.; Kochnev, N.N.; Panov, B.L.; Korotkevich, O.S.; Kulikova, S.G.; Marenkov, V.G. **Genetics of cattle resistance to tuberculosis.** *Proceedings of the 6th World Congress on Genetics Applied to Livestock Production, Armidale, NSW, Australia, 11-16 January, 1998. Volume 27: Reproduction; fish breeding; genetics and the environment; genetics in agricultural systems; disease resistance; animal welfare; computing and information technology; tree breeding.* Armidale; Australia: Animal Genetics and Breeding Unit. 1998. p. 365-366.

**NAL Call Number:** SF105 W67 1998

**Descriptors:** cattle, cows, progeny, tuberculosis, heritability, bulls, morbidity, genetic selection, disease resistant cattle, *Mycobacterium*, Russia.

Prasad, H.; Roychoudhury, R.K.; Phukan, A. **Blood chemistry of tuberculous cows.** *Indian Veterinary Journal.* 1998. 75 (2) 178-179.

**NAL Call Number:** 41.8 IN2

**Descriptors:** serum samples, cattle, cows, calcium, magnesium, phosphorus, inorganic phosphorus, concentrations, possible diagnostic value, *Mycobacterium*.

Rathore, B.S. **An epidemiological study on buffalo morbidity and mortality based on four year observations on 18 630 buffaloes maintained at 28 livestock farms in India.** *Indian Journal of Comparative Microbiology, Immunology*

*and Infectious Diseases*. 1998. 19 (1) 43-49.

**Descriptors:** buffalo morbidity and mortality, various factors, age, breed, sex, bacterial diseases, viral diseases, ketosis, nutritional deficiencies, hypoprotein anemia, FMD, rabies, tuberculosis, *Mycobacterium*, tetanus, parasites, flukes, worms, neoplasma, prevalence, diagnosis.

Roxo, E.; Vasconcellos, S.A.; Pinheiro, S.R.; Baruselli, P.S.; Macruz, R.; Leite, C.Q.L. **Evaluation of tuberculin skin reaction in buffaloes (*Bubalus bubalis*)**. *Arquivos do Instituto Biologico Sao Paulo*. 1998. 65 (1) 81-92; 31. Note: In English with a Portuguese summary.

**NAL Call Number:** 442.9 SA6

**Descriptors:** buffalo, *Bubalus bubalis*, tuberculin skin test, evaluation, tuberculosis, *Mycobacterium bovis*, diagnostic techniques, *Mycobacterium avium* complex.

Ryan, T.J.; Livingstone, P.G.; Bailey, J.B.; Carter, C.E.; Crews, K.B.; Timbs, D.V. **Tuberculosis control in livestock in New Zealand: the current situation and future directions**. *Proceedings of a Meeting, Society for Veterinary Epidemiology and Preventive Medicine* [Great Britain]. 1998. p. 1-14. ISSN: 0956-7496. Note: Meeting held on March 25-27, 1998, Ennis.

**NAL Call Number:** SF780.9.S63

**Descriptors:** *Mycobacterium bovis*, disease control, livestock tuberculosis, New Zealand.

Sala, V.; Antonini, M. **Attualita e prospettive della tubercolosi suina. [Current aspects and the future of tuberculosis in pigs.]** *Summa*. 1998. 15 (3) 61-65. Note: In Italian with an English summary.

**Descriptors:** pigs, *Mycobacterium avium*, epidemiology, tuberculosis, current state of the disease, Italy.

Shehab, M.M. (ed.); El Tahlawy, M.R. (ed.); Mahmoud, M.R. *Eighth Scientific Congress, Faculty of Veterinary Medicine, Assiut University, 15-17 November, 1998*. Assiut; Egypt, Faculty of Veterinary Medicine, Assiut University; 1998. 927 pp. Note: 74 papers.

**Descriptors:** livestock animals, cattle, camels, buffaloes, goats, sheep, rabbits, donkeys, dogs, pigs, mice, poultry, horses, rats, shrimp, many diseases, tuberculosis, brucellosis, aflatoxins, dermatitis, *Mycobacterium*.

Sheshagiri; Puttabyatappa, B.; Krishnappa, G.; Jhala, M.K. **Assay of serum cytotoxicity levels in bovine tuberculin positive, doubtful and negative reactors**. *Indian Veterinary Journal*. 1998. 75 (8) 679-682.

**NAL Call Number:** 41.8 IN2

**Descriptors:** cattle, *Mycobacterium tuberculosis*, diagnostic techniques, cell lines, intradermal test, L-929 cells, actinomycin, diagnostic tests, tuberculosis, diagnosis, cytotoxicity, bacterial diseases, cattle diseases.

Signorini, G.C.; Nannipieri, S.; Biagi, G.; Rasori, P. **Scambi intracomunitari di animali: problemi di polizia sanitaria. [Animal trade in the European Union: policing problems.]** *Atti della Societa Italiana di Buiatria*. 1998. 30: 239-246. OTAUSO: Congresso Nazionale, Piacenza, Italy, May 1998. Note: In Italian with an English summary.

**Descriptors:** European Union, international trade in animals, disease risks, FMD, *Mycobacterium*, tuberculosis, brucellosis, rabies, anthrax, leukosis, pleuropneumonia, legislation, disease control.

Sutmoller, P.; Taylor, P. **An assessment of the risk of disease transmission by llama embryos**. *Proceedings One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October, 1998*. United States Animal Health Association; Richmond; USA 1998. p. 251-275.

**NAL Call Number:** 49.9 UN3R

**Descriptors:** llamas, artificial insemination, semen, embryo transfer, international trade, disease transmission, risk assessment, risk factors, foot and mouth disease, bluetongue virus, *Brucella*, *Mycobacterium*, *Aphthovirus*, methodology, contamination, epidemiology, Chile, US.

UK, State Veterinary Service. **Focus on aspects of tuberculosis research**. *State Veterinary Journal*. 1998. 8 (3) 3-4.

**NAL Call Number:** SF601 S8

**Descriptors:** cattle, *Mycobacterium bovis*, DNA fingerprinting, tuberculosis, research, vaccine development, diagnostic techniques, UK.

United States Animal Health Association. *Proceedings: One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October, 1998*. Richmond: The Association. 1998. 756

pp.

**NAL Call Number:** 49.9 UN3R

**Descriptors:** livestock, pigs, cattle, bison, horses, llamas, poultry, aquaculture species, wildlife, animal welfare, biotechnology, disease outbreaks, feeds, food safety, international trade, parasitoses, drugs, environment, rabies, bluetongue virus; Retroviridae, *Leptospira*, Aujeszky virus, *Salmonella*, *Mycobacterium bovis*, *Mycobacterium avium* ssp. *paratuberculosis*, USA.

Vitale, F.; Capra, G.; Maxia, L.; Reale, S.; Vesco, G.; Caracappa, S. **Detection of *Mycobacterium tuberculosis* complex in cattle by PCR using milk, lymph node aspirates, and nasal swabs.** *Journal of Clinical Microbiology*. Apr 1998. 36 (4) 1050-1055. ISSN: 0095-1137

**NAL Call Number:** QR46.J6

**Descriptors:** cattle, diagnosis, polymerase chain reaction, diagnostic techniques, *Mycobacterium tuberculosis*.

Wahlstrom, H.; Englund, L.; Carpenter, T.; Emanuelson, U.; Engvall, A.; Vagsholm, I. **A Reed-Frost model of the spread of tuberculosis within seven Swedish extensive farmed fallow deer herds.** *Preventive Veterinary Medicine*. 1998. 35 (3) 181-193.

**NAL Call Number:** SF601 P7

**Descriptors:** farmed fallow deer, tuberculosis, disease transmission, zoonoses, epidemiology, herds, Reed-Frost mathematical models, estimate numbers of new infections, epidemics, *Mycobacterium bovis*, Sweden.

Wang, Z.G. **Isolation and identification of atypical mycobacteria from cattle.** *Journal of Jilin Agricultural University*. 1998. 20 (2) 73-77. Note: In Chinese with an English summary.

**Descriptors:** atypical strain, cattle, lymph nodes, post slaughter tissue harvesting, *Mycobacterium scrofulaceum*, *Mycobacterium fortuitum*, *Mycobacterium avium* intracellulare complex, *Mycobacterium paratuberculosis*, *Mycobacterium flavescens*, an unknown rapid grower, China.

Wood, P.R.; Jones, S.L. **Bovigam TM an internationally accredited diagnostic test for bovine tuberculosis** *Proceedings One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October, 1998*. United States Animal Health Association; Richmond; USA. 1998. p. 687-697.

**NAL Call Number:** 49.9 UN3R

**Descriptors:** cattle, *Mycobacterium bovis*, Bovigam TM diagnostic test, methodology, diagnostic techniques, USA.

Zorawski, C.; Lipiec, M. **Gruzlica bydla i jej zwalczanie. [Bovine tuberculosis and its prevention.]** *Medycyna Weterynaryjna*. 1998. 54 (8) 520-522. Note: In Polish.

**NAL Call Number:** 41.8 M463

**Descriptors:** *Mycobacterium*, cattle, humans, epidemiology, public health risks, skin tests, tuberculin, wild animals, tuberculosis, disease prevention, Poland.

## 1997

Ali, O.A.; Abdel Salam, E.B. **Incidence of animal diseases in Tripoli (Libya): a ten-year (1982-1991) pathological survey.** *Sudan Journal of Veterinary Science and Animal Husbandry*. 1997. 36 (1-2) 141-148.

**NAL Call Number:** 41.9 SU22

**Descriptors:** livestock animal diseases, dogs, pathology, abscesses, cirrhosis, coccidiosis, enteritis, hepatitis, leucosis, liver abscesses, liver flukes, lymphadenitis, Marek's disease, mastitis, pneumonia, poultry, *Mycobacterium*, tuberculosis, pasteurellosis, bovine mastitis, paratuberculosis, pulmonary adenomatosis, canine parvovirus, Libya.

Costello, E.; Egan, J.W.A.; Quigley, F.C.; O'Reilly, P.F. **Performance of the single intradermal comparative tuberculin test in identifying cattle with tuberculous lesions in Irish herds.** *Veterinary Record*. Aug 30, 1997. 141 (9) 222-224. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculin skin tests, tuberculosis, herd health, chronic course, lesions, diagnostic value, Irish Republic.

Costello, E.; O'Reilly, P.F.; Yearsley, D.K.; O'Grady, D.P.; O'Reilly, L.M.; Collins, J.D.; Monaghan, M.L.; Bassett, H.F. **A study of an enzyme-linked immunosorbent assay for the diagnosis of tuberculosis in cattle.** *Irish Veterinary*

*Journal*. 1997. 50 (1) 35-38.

**NAL Call Number:** 41.8 IR4

**Descriptors:** diagnosis, cattle, *Mycobacterium bovis*, comparison study, three assay systems, ELISA on serum and tuberculin, anamnestic ELISA after intradermal inoculation with tuberculin and ELISA using PPD (bovine and avian), not sensitive enough for herd testing.

Debbie, P.; Young, K.; Pooler, L.; Lamp, C.; Marietta, P.; Wagner, R. **Allele identification using immobilized mismatch binding protein: detection and identification of antibiotic-resistant bacteria and determination of sheep susceptibility to scrapie.** *Nucleic Acids Research*. Dec 1, 1997. 25 (23) 4825-4829. ISSN: 0305-1048

**NAL Call Number:** QD341.A2N8

**Descriptors:** sheep, scrapie, susceptibility, structural genes, alleles, animal proteins, identification, *Mycobacterium tuberculosis*, rifampicin, drug resistance, strains, DNA binding proteins, polymerase chain reaction, biotin, DNA probes, genotypes, animal prion proteins, biotin labeled probes, PRP gene, RPOB gene.

Ferreira-Neto, J.S.; Ferreira, F.; Fiaschitello, A.M.G.P.; Balian, S.C.; Faggin, G.; Farina, L. **Andamento della tubercolosi bovina in Brasile. [Occurrence of bovine tuberculosis in Brazil.]** *Rivista di Agricoltura Subtropicale e Tropicale*. 1997. 91 (1) 31-41. Note: In Italian with an English summary.

**NAL Call Number:** S494.5 S86 J68

**Descriptors:** bovine tuberculosis, prevalence, epidemiology, cattle, *Mycobacterium bovis*, Brazil.

Giron, D.O. **Tuberculosis bovina (parte II). [Bovine tuberculosis. Part II.]** *Noticampo*. 1997. No. 005, 5-9. Note: In Spanish.

**NAL Call Number:** S475 C7N67

**Descriptors:** tuberculosis, symptoms, diagnosis, cattle, *Mycobacterium bovis*.

Gupta, V.K.; Ram, G.C. **Enzyme-linked immunosorbent assay for detection of *Mycobacterium bovis* antibodies in cattle.** *Indian Journal of Animal Sciences*. 1997. 67 (1) 3-6.

**NAL Call Number:** 41.8 IN22

**Descriptors:** cows, antibody testing, PPD, glycolipid neoantigen (MB-O-BSA), ELISA, diagnosis.

Hernandez de Anda, J.; Renteria-Evangelista, T.; Lopez-Valencia, G.; Montano-Hodgers, M. **An abattoir monitoring system for diagnosis of tuberculosis in cattle in Baja California, Mexico.** [Erratum: Dec 15, 1997. 211 (12), p. 1576.]. *Journal of the American Veterinary Medical Association*. Sept 15, 1997. 211 (6) 709-711. ISSN: 0003-1488

**NAL Call Number:** 41.8 Am3

**Descriptors:** beef cattle, dairy cattle, tuberculosis monitoring, disease surveys, slaughter houses, disease prevalence, postmortem examinations, Mexico.

Higgins, A.J. **Tuberculosis and badgers--facing up to facts.** *Veterinary Journal*. Mar 1997. 153 (2) 117-118. ISSN: 1090-0233

**NAL Call Number:** SF601.V484

**Descriptors:** *Mycobacterium tuberculosis*, cattle, badgers, *Meles meles*, tuberculosis, reservoir hosts, disease control.

Hutchings, M.R.; Harris, S. **Effects of farm management practices on cattle grazing behaviour and the potential for transmission of bovine tuberculosis from badgers to cattle.** *Veterinary Journal*. Mar 1997. 153 (2) 149-162. ISSN: 1090-0233

**NAL Call Number:** SF601.V484

**Abstract:** Despite the large body of circumstantial evidence to suggest a link, the means by which bovine tuberculosis is passed from badgers to cattle remains unclear; pasture contamination with the urine, faeces and/or sputum of infectious badgers is believed to be the main route of transmission. Therefore the behaviour of grazing cattle was studied to determine whether they avoided investigating and/or grazing pasture contaminated with badger excreta, and whether different farm management practices enhanced the potential for disease transmission. Active latrines were avoided by most cattle until the sward length in the rest of the field was reduced, after which there was an increasing likelihood that active badger latrines would be grazed. Most of the cattle grazed active badger latrines, but cattle of low rank within the herd grazed latrines more heavily. Farm management practices that reduced the availability of long swards shortened the period of investigative behaviour and greatly enhanced the risk that cattle would graze active badger latrines. Cattle were more likely to graze pasture away from latrines that was contaminated either with badger

urine or single faeces. Because bacilli remain viable in the soil for up to 2 years, there is the potential for bacilli to accumulate at active badger latrines, and these could pose a significant risk to cattle, even when the latrine is no longer being used by badgers. Cattle readily grazed the lush sward at disused latrines, during which they could ingest contaminated soil; the amount of soil ingested increases as sward length decreases.

**Descriptors:** *Mycobacterium*, cattle tuberculosis, *Meles meles*, disease transmission, grazing, pasture contamination, excreta, plant height, rotational grazing, cutting of swards.

Kao, R.R.; Roberts, M.G.; Ryan, T.J. **A model of bovine tuberculosis control in domesticated cattle herds.**

*Proceedings of the Royal Society of London, Biological Sciences.* July 22, 1997. 264 (1384) 1069-1076. ISSN: 0962-8452

**NAL Call Number:** 501 L84B

**Descriptors:** cattle, tuberculosis, *Mycobacterium*, disease control, mathematical models.

Khaled, K.; Dhaou, M.A. **Pollution des lieux de l'activité des abattoirs. [Environmental pollution from abattoirs.]**

*Tunisie Medicale.* 1997. 75 (5) 357-361. Note: In French.

**Descriptors:** animal wastes, slaughter plants, abattoirs, slaughterhouse waste, polluted liquid wastes, carcasses, blood, tuberculosis, *Salmonella*, *Mycobacterium*, coliform bacteria, composting waste disposal, public health, Tunisia.

Krebs, John R. Great Britain. Ministry of Agriculture, Fisheries and Food. Scottish Office. Agriculture, Environment and Fisheries Dept. Welsh Office. Agriculture Dept. *The Government's Response to the Krebs Report on Bovine Tuberculosis in Cattle and Badgers.* London, Ministry of Agriculture, Fisheries and Food, c1997. [8] p.

**NAL Call Number:** SF967.T8G74 1997

**Descriptors:** tuberculosis in cattle, badgers, *Mycobacterium*, *Meles meles*, disease reservoirs, prevention and control, *Mycobacterium*, Great Britain.

Krebs, J. R. (John R.) Independent Scientific Review Group (Great Britain ) Great Britain Ministry of Agriculture, Fisheries and Food. *Bovine Tuberculosis in Cattle and Badgers: Report to the Rt. Hon. Dr. Jack Cunningham, MP.* London, Ministry of Agriculture, Fisheries and Food, 1997. 191 p.

**NAL Call Number:** SF967.T8K74 1997

**Descriptors:** tuberculosis, cattle, badgers, *Meles meles*, control, prevention, badgers, disease reservoirs, *Mycobacterium*, Great Britain.

Kudi, A.C.; Kalla, D.J.U.; Alkali, Y.; Ladan, S.M.; Kudi, M.C.; Mai, H. **Abattoir survey of small ruminant diseases in Bauchi, Nigeria.** *Revue d'Elevage et de Medecine Veterinaire des Pays Tropicaux.* 1997. 50 (4) 281-284. Note: In English with French and Spanish summaries.

**NAL Call Number:** 41.8 R3262

**Descriptors:** sheep, goats, post slaughter examinations, most common diseases seen, helminthosis, pneumonia, tuberculosis, seasonal effects, species effects, sex effects, disease prevalence, parasites, rainy season, tape worms, flukes, *Mycobacterium*, Nigeria.

Latini, O.; Canal, A.M.; Ferrara, M.E.; Sequeira, M.D.; Sequeira, G.; Bagnaroli, R.; Torres, P. **Confiability en la determinacion de prevalencia de infeccion por *Mycobacterium bovis* en ganado bovino por decomisos en frigorificos. [The reliability of using carcass condemnation in abattoirs to determine the prevalence of *Mycobacterium bovis* in cattle.]** *Archivos de Medicina Veterinaria.* 1997. 29 (2) 197-204. Note: In Spanish with an English summary.

**NAL Call Number:** SF604 A75

**Descriptors:** post-slaughter carcass condemnation, meat inspection, tuberculosis, diagnosis, disease control, *Mycobacterium bovis*, cattle, Argentina.

Leifsson, P.S.; Olsen, S.N.; Larsen, S. **Ocular tuberculosis in a horse.** *Veterinary Record.* Dec 20/27, 1997. 141 (25) 651-654. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** horses, tuberculosis, *Mycobacterium avium*, eyes, pathology, blindness, atypical disease course, case reports

Lensch, J.H.; Geilhausen, H.E.; Yang, RongZhen (ed.); Han, XingTai (ed.); Luo, XiaoLin **Infectious and parasitic**

**diseases in the yak.** *Yak production in Central Asian Highlands. Proceedings of the second international Congress on Yak, Xining, China, 1-6 September, 1997.* Qinghai People's Publishing House; Xining; China. 1997. p. 223-228.

**Descriptors:** overview, diseases of the yak, zoonotic diseases, ectoparasites, infectious diseases, FMD, rinderpest, rabies, stomatitis, cowpox, hemorrhagic septicaemia, *Mycobacterium tuberculosis*, brucellosis, lymphadenitis, mastitis, endometritis, coliform bacteria, conjunctivitis, fascioliasis, helminthes, helminthoses, parasitoses, ectoparasitoses, parasites, *Aphthovirus*, *Pasteurella multocida*, *Brucella*, *Chlamydia*, *Hypoderma bovis*, *Metastigmata*, Ixodidae ticks, *Fasciola hepatica*, Asia.

Lyashchenko, K.P.; Bilko, I.P.; Kolesnikova, I.N.; Lyashko, E.D.; Matyash, M.A.; Mikhalsky, L.A.; Smirnov, V.V.; Komissarenko, S.V. **Specific identification of *Mycobacterium bovis* by monoclonal antibody-based enzyme immunoassay.** *Mikrobiologichnii Zhurnal.* 1997. 59 (3) 46-53. Note: In English with Ukrainian and Russian summaries.

**Descriptors:** ELISA, mouse monoclonal antibodies, differential diagnosis, western blot analysis, *Mycobacterium bovis*, *Mycobacterium avium* complex, *Mycobacterium smegmatis*, *Mycobacterium tuberculosis*, polyclonal and cross reactive monoclonal antibodies, species identification.

Monaghan, M.; Quinn, P.J.; Kelly, A.P.; McGill, K.; McMurray, C.; O'Crowley, K.; Bassett, H.F.; Costello, E.; Quigley, F.; Rothel, J.S.; Wood, P.R.; Collins, J.D. **A pilot trial to evaluate the gamma-interferon assay for the detection of *Mycobacterium bovis* infected cattle under Irish conditions.** *Irish Veterinary Journal.* 1997. 50 (4) 229-232.

**NAL Call Number:** 41.8 IR4

**Descriptors:** IFN-gamma assay, *Mycobacterium bovis*, cattle, intradermal tuberculin test, diagnostic test, Irish Republic.

Ng, K.H.; Aldwell, F.E.; Wedlock, D.N.; Watson, J.D.; Buddle, B.M. **Antigen-induced interferon-gamma interleukin-2 responses of cattle inoculated with *Mycobacterium bovis*.** *Veterinary Immunology and Immunopathology.* June 1997. 57 (1/2) 59-68. ISSN: 0165-2427

**NAL Call Number:** SF757.2.V38

**Abstract:** Bovine purified protein derivative (PPD)-induced interferon-gamma (IFN-gamma) and interleukin-2 (IL-2) mRNA expression was measured in peripheral blood lymphocyte cultures of cattle inoculated with *Mycobacterium bovis* and compared to cytokine protein levels as measured by IFN-gamma enzyme-linked immunosorbent assay and IL-2 bioassay. For individual animals, positive correlations were observed between mRNA and protein levels of bovine PPD-induced IFN-gamma and IL-2, although the correlations were stronger for IFN-gamma. Expression of these two cytokines also correlated with responses from a comparative intradermal test and a *M. bovis* antibody test. At 7 and 20 weeks after inoculation, bovine PPD-induced IFN-gamma and IL-2 mRNA expression was detected in all animals with tuberculous lesions and in a proportion of the *M. bovis*-inoculated animals with no lesions. Correlation of antigen-induced IFN-gamma and IL-2 with other immune parameters suggests that these two cytokines play an important role in the immune response to bovine tuberculosis.

**Descriptors:** lymphocyte cultures, cattle, experimental inoculation, *Mycobacterium bovis*, PPD IFN, IL2, mRNA expression. Immune response, cytokines, bovine tuberculosis.

Resende, J.; Palis-Aguiar, P.H.; de Noronha-Gomes, N.B. **Tuberculose genital em bufalo - relato de um caso. [Genital tuberculosis in buffalo bulls - case report.]** *Arquivos da Escola de Medicina Veterinaria da Universidade Federal da Bahia.* 1997. 19 (1) 74-79. Note: In Portuguese with an English summary.

**Descriptors:** case reports, buffalos, bulls, male genitalia, tuberculosis, pathology, histopathology, clinical aspects, symptoms, diagnosis, treatment, castration, *Mycobacterium*, Brazil.

Schijns, V.E.C.J. (ed.); Horzinek, M.C. *Cytokines in veterinary medicine.* Wallingford, UK, CAB International. 1997 xxiv+324 pp.

**NAL Call Number:** SF757.25 C997 1997

**Descriptors:** diagnosis of tuberculosis, *Mycobacterium*, sheep, pigs, horses, avian, cats, cytokines in disease, responses and regulation, interferon-gamma assay.

Schmitt, S.M.; Fitzgerald, S.D.; Cooley, T.M.; Bruning-Fann, C.S.; Sullivan, L.; Berry, D.; Carlson, T.; Minnis, R.B.; Payeur, J.B.; Sikarskie, J. **Bovine tuberculosis in free-ranging white-tailed deer from Michigan.** *Journal Wildlife*

*Disease*. Oct 1997. 33 (4) 749-758. ISSN: 0090-3558

**NAL Call Number:** 41.9 W64B

**Descriptors:** white-tailed deer, *Odocoileus virginianus*, *Mycobacterium bovis*, wild animals, bovine tuberculosis.

Sun, L.; Kang, D.; Ge, X.; Sun, J.H.; Li, R.Z. **Application of PPA-ELISA for the detection of avian tuberculosis antibody in chicken serum.** *Chinese Journal of Animal Quarantine*. 1997. 14 (3) 11-13. Note: In Chinese.

**Descriptors:** *Mycobacterium avium*, antibodies, rabbit anti-chicken IgG immune serum, diagnostic test, PPA-ELISA, chickens, experimental infections, test sensitivity, test specificity and cost, SPF flocks.

Torres, P.; Antognoli, M.C.; Moreira, A.R.; de Kantor, I.N. de. **La vacuna antiaftosa con adyuvante oleoso y su posible influencia en el diagnostico de la tuberculosis en bovinos. [Foot and mouth disease oil-adjuvant vaccine and its possible role in the diagnosis of tuberculosis in cattle.]** *Boletin del Centro Panamericano de Fiebre Aftosa*. 1997. No. 62-63, 39-42. Note: In Spanish with a English and Portuguese summary.

**NAL Call Number:** SF793 P3

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculosis, diagnosis, foot and mouth disease, humoral immunity, adjuvants, vaccines, effects of vaccination, ELISA.

United States Animal Health Association. *Proceedings One Hundred and First Annual Meeting of the United States Animal Health Association, Louisville, Kentucky, USA, 18-24 October, 1997*. Richmond, Va, The Association. 1997. 619 pp.

**NAL Call Number:** 49.9 UN3R

**Descriptors:** issues of disease control, animal diseases and animal production, disease surveillance and animal health systems, bluetongue and bovine retrovirus; brucellosis, captive wildlife and alternative livestock, environmental residues, biosafety, foreign animal diseases, infectious diseases, sheep, goats, pigs, wildlife, poultry, cattle, bison, llama, horses, *Mycobacterium*, Johne's disease, leptospirosis, parasitic diseases, pseudorabies, rabies, *Salmonella*, tuberculosis.

United States. Food Safety and Inspection Service. **Tuberculosis: what you need to know.** Washington, D.C., FSIS, [1997]

**URL:** <http://www.fsis.usda.gov/OPHS/tbbroch.htm>

**NAL Call Number:** aRA644.T7T83 1997

**Descriptors:** tuberculosis in animals, food safety, United States.

## HISTORICAL DOCUMENT

Smith, T. **Some practical suggestions for the suppression and prevention of bovine tuberculosis.** *Yearbook*. United States Dept. Agriculture, Washington, G.P.O., 1895-1920. 1894 (pub. 1895). p. 317-330. *Bulletin*. United States Dept. of Agriculture, Division of Publications.

**NAL Call Number:** 1Ag84Y

**Descriptors:** dairy cows, tuberculosis, *Mycobacterium bovis*, disease control, disease prevention, zoonoses, USA.

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# Wildlife

2007

Acevedo, P.; Vicente, J.; Hofle, U.; Cassinello, J.; Ruiz-Fons, F.; Gortazar, C. **Estimation of European wild boar relative abundance and aggregation: a novel method in epidemiological risk assessment.** *Epidemiology and Infection*. 2007; 135 (3): 519-527. ISSN: 0950-2688

**URL:** <http://journals.cambridge.org/action/displayJournal?jid=HYG>

**NAL Call Number:** RA651.A1E74

**Descriptors:** wild boars (*Sus scrofa*), pigs, disease reservoirs, wildlife epidemiology, fecal dropping frequency, transects, spatial aggregation indices, runs test statistic, hunting data, porcine circovirus, Aujeszky's disease virus seroprevalences, *Mycobacterium tuberculosis* complex, *Metastrongylus* spp. prevalence, Spain.

Bennett, R.; Willis, K. **Public opinions on badger populations and the control of tuberculosis in cattle in the UK.** *Veterinary Record*. 2007; 160 (8): 266-268. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/archive/>

**NAL Call Number:** 41.8 V641

**Descriptors:** opinion survey questionnaire, prevention of bovine tuberculosis, badger management, telephone and mail survey, wildlife management sometimes necessary, role of government, opinions of population management of badgers, cost benefit, England, Wales.

Corner, L.A.L. **Bovine tuberculosis control in Australia, New Zealand and Ireland: wild animals and the epidemiology of tuberculosis in domestic animals.** *Cattle Practice*. 2007; 15 (1): 3-12. ISSN: 0969-1251

**URL:** <http://www.bcva.org.uk>

**NAL Call Number:** SF961.C37

**Descriptors:** badgers, cattle, deer, *Mycobacterium bovis*, wild animals as disease reservoirs, disease surveillance, control programs studies for Australia, New Zealand, Ireland.

Morar, D.; Tijhaar, E.; Negrea, A.; Hendriks, J.; Haarlem, D. van; Godfroid, J.; Michel, A.L.; Rutten, V.P.M.G.

**Cloning, sequencing and expression of white rhinoceros (*Ceratotherium simum*) interferon-gamma (IFN-(Sd(B) and the production of rhinoceros IFN-(Sd(B specific antibodies.** *Veterinary Immunology and Immunopathology*. 2007 Jan 15; 115 (1-2): 146-154. ISSN: 0165-2427

**URL:** <http://dx.doi.org/10.1016/j.vetimm.2006.10.016>

**NAL Call Number:** SF757.2.V38

**Abstract:** Bovine tuberculosis (BTB) is endemic in African buffalo (*Syncerus caffer*) in the Kruger National Park (KNP). In addition to buffalo, *Mycobacterium bovis* has been found in at least 14 other mammalian species in South Africa, including kudu (*Tragelaphus strepsiceros*), Chacma baboon (*Papio ursinus*) and lion (*Panthera leo*). This has raised concern about the spillover into other potentially susceptible species like rhinoceros, thus jeopardising breeding and relocation projects aiming at the conservation of biodiversity. Hence, procedures to screen for and diagnose BTB in black rhinoceros (*Diceros bicornis*) and white rhinoceros (*Ceratotherium simum*) need to be in place. The Interferon-gamma (IFN-(Sd(B) assay is used as a routine diagnostic tool to determine infection of cattle and recently African buffalo, with *M. bovis* and other mycobacteria. The aim of the present work was to develop reagents to set up a rhinoceros IFN-(Sd(B (RhIFN-(Sd(B) assay. The white rhinoceros IFN-(Sd(B gene was cloned, sequenced and expressed as a mature protein. Amino acid (aa) sequence analysis revealed that RhIFN-(Sd(B shares a homology of 90% with equine IFN-(Sd(B. Monoclonal antibodies, as well as polyclonal chicken antibodies (Yolk Immunoglobulin-IgY) with specificity for recombinant RhIFN-(Sd(B were produced. Using the monoclonals as capture antibodies and the polyclonal IgY for detection, it was shown that recombinant as well as native white rhinoceros IFN-(Sd(B was recognised. This preliminary IFN-(Sd(B enzyme-linked immunosorbent assay (ELISA), has the potential to be developed into a diagnostic assay for *M. bovis* infection in rhinoceros.

**Descriptors:** white rhinoceros (*Ceratotherium simum*) endangered species, *Mycobacterium bovis*, development of an IFN-(Sd(B ELISA), potential approach for a diagnostic assay.

Muller, M.; Naumann, L.; Weber, A.; Ehrlein, J.; Ewringmann, T.; Krisch, A.; Kahlau, D. **Nachweis des *Mycobacterium tuberculosis*-Komplexes bei Wildschweinen mittels PCR. [Detection of *Mycobacterium tuberculosis* complex in wild boars by PCR.]** *Tierärztliche Umschau*. 2007; 62 (3): 140-143. ISSN: 0049-3864. Note: In German with an English summary.

**URL:** <http://www.tu-online.de>

**NAL Call Number:** 41.8 T445

**Descriptors:** wild pigs, wild boar, lymph node tissue, PCR assay, *Mycobacterium*, *Mycobacterium avium*, *Mycobacterium terrae*, *Mycobacterium tuberculosis*, *Mycobacterium nonchromogenicum*; *Mycobacterium triviale*, culture medium, modified Middlebrook medium (BACTEC MGIT 960 System), Lowenstein-Jensen and Stonebrink culture media, Bavaria, Germany.

Naranjo, Victoria; Villar, Margarita; Martin-Hernando, Ma Paz; Vidal, Dolores; Hoefle, Ursula; Gortazar, Christian; Kocan, Katherine M.; Vazquez, Jesus; de la Fuente, Jose. **Proteomic and transcriptomic analyses of differential stress/inflammatory responses in mandibular lymph nodes and oropharyngeal tonsils of European wild boars naturally infected with *Mycobacterium bovis*.** *Proteomics*. 2007; 7 (2): 220-231. ISSN: 1615-9853

**URL:** <http://www3.interscience.wiley.com/cgi-bin/jhome/76510741>

**Descriptors:** *Mycobacterium bovis* pathogen, natural infection, *Sus scrofa*, European wild boar, wild animals as disease reservoirs, host, serum, oropharyngeal tonsil, dental and oral area, differential stress/inflammatory responses, mRNA and protein levels of mandibular lymph node, host-pathogen interactions.

Newton-Cross, Geraldine; White-Piran C.L.; Harris, Stephen. **Modelling the distribution of badgers *Meles meles*: comparing predictions from field-based and remotely derived habitat data.** *Mammal Review*. 2007; 37 (1): 54-70. ISSN: 0305-1838

**URL:** <http://www.blackwell-synergy.com/loi/mam?cookieSet=1>

**Descriptors:** badgers (*Meles meles*), habitat data, populations distribution and abundance, conservation and wildlife epidemiology, wildlife host for *Mycobacterium bovis*, digital survey, model accuracy, 4 large scale presence/absence models, 1980s and 1990;s survey data (field and digital), model accuracy, Britain.

Renwick, A.R.; White, P.C.L.; Bengis, R.G. **Bovine tuberculosis in southern African wildlife: a multi-species host-pathogen system.** *Epidemiology and Infection*. 2007; 135 (4): 529-540. ISSN: 0950-2688

**URL:** <http://journals.cambridge.org/action/displayJournal?jid=HYG>

**NAL Call Number:** RA651.A1E74

**Descriptors:** bovine tuberculosis, marsh antelope (*Kobus lechwe*), leopards, lions, *Mycobacterium bovis*, baboon (*Papio ursinus*), buffalo (*Syncerus caffer*), *Tragelaphus strepsiceros*, savannah ecosystem, hosts for disease, spatial distribution and resource utilization patterns, disease susceptibility, disease transmission, pathogenicity of *Mycobacterium* pathogen, multi-host models, Southern Africa.

Seward, Nathan W.; Phillips, Gregory E.; Duquette, Jared F.; Vercauteren, Kurt C. **A frightening device for deterring deer use of cattle feeders.** *Journal of Wildlife Management*. 2007; 71 (1): 271-276. ISSN: 0022-541X

**URL:** <http://www.bioone.org/perlserv/?request=get-archive&issn=0022-541X&ct=1>

**NAL Call Number:** 410 J827

**Abstract:** The presence of bovine tuberculosis (TB) in cattle can negatively impact a state's economy and cattle industry. In Michigan, USA, wild white-tailed deer (*Odocoileus virginianus*) are a reservoir for reinfecting cattle herds. Although direct TB transmission between deer and cattle is rare, infected deer may contaminate cattle feed. To mitigate this risk, we designed and evaluated a deer-resistant cattle feeder (DRCF) device for deterring deer from feeders. The device delivered negative stimuli to condition deer to avoid cattle feeders. We tested the device by conducting a comparative change experiment at a high-density captive white-tailed deer operation in northeastern lower Michigan using pretreatment and treatment periods and random allocation of DRCF protection to 3 of 6 feeders during the treatment period. We used animal-activated cameras to collect data on deer use of feeders. Deer use was similar at protected and unprotected feeders during the pretreatment period but was lower at protected feeders during the treatment period. Deer-resistant cattle feeders were 100% effective during the first 2 treatment weeks, 94% during the first 5 weeks, but effectiveness then dropped to 61% during the final week. Excluding problems associated with low battery power and infrared sensors, DRCFs were 99% effective at deterring deer. Our results suggest that DRCFs can effectively limit deer use of cattle feed, potentially with minimal impact on feeding behavior of cattle, thus reducing

potential transmission of bovine TB through contaminated feed. By employing DRCFs in bovine TB endemic areas, especially at times that deer are food stressed, agencies and producers can practically and economically reduce the potential for bovine TB to be transmitted from deer to cattle.

**Descriptors:** white-tailed deer, (*Odocoileus virginianus*), feeding patterns, negative stimulus deer resistant cattle feeder, long term effectiveness, feeding stations, disease transmission between species, *Mycobacterium bovis*, wild vs captive deer operation, Michigan, US.

Sharma, S.; Mallick, G.P.; Rishendra Verma; Ray, S.K. **Polymerase chain reaction (PCR) amplification of IS6110 sequences to detect *Mycobacterium tuberculosis* complex from formalin-fixed paraffin-embedded tissues of deer (*Axis axis*).** *Veterinary Research Communications*. 2007; 31 (1): 17-21. ISSN: 0165-7380

**URL:** <http://springerlink.metapress.com/link.asp?id=103009>

**NAL Call Number:** SF601.V38:

**Descriptors:** Axis deer (*Cervus axis*), diagnostic test, PCR IS6110 sequences, fixed tissue samples, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, India.

Skoric, M.; Shitaye, E.J.; Halouzka, R.; Fictum, P.; Trcka, I.; Heroldova, M.; Tkadlec, E.; Pavlik, I. **Tuberculous and tuberculoid lesions in free living small terrestrial mammals and the risk of infection to humans and animals: a review.** *Veterinarni Medicina*. 2007; 52 (4): 144-161. ISSN: 0375-8427

**URL:** <http://vetmed.vri.cz>

**NAL Call Number:** 41.9 C333

**Descriptors:** *Brucella*, *Francisella tularensis*, *Mycobacterium avium* complex, *Mycobacterium avium* ssp *paratuberculosis*, *Mycobacterium lepraemurium*, *Mycobacterium tuberculosis*, rodents, *Salmonella*, free living small land mammals, bacterial pathogens, morphology of tuberculoid lesions, tularemia.

Smith, G.C.; Bennett, R.; Wilkinson, D.; Cooke, R. **A cost-benefit analysis of culling badgers to control bovine tuberculosis.** *Veterinary Journal*. 2007; 173 (2): 302-310. ISSN:

**URL:** <http://www.sciencedirect.com/science/journal/10900233>

**Descriptors:** cattle, herds, badgers (*Meles meles*), simulated culling strategies, badger trapping and gassing, disease control strategy *Mycobacterium bovis*, disease transmission, UK Government's Department for Environment Food and Rural Affairs (Defra), UK.

Vicente, J.; Delahay, R.J.; Walker, N.J.; Cheeseman, C.L. **Social organization and movement influence the incidence of bovine tuberculosis in an undisturbed high-density badger *Meles meles* population.** *Journal of Animal Ecology*. 2007; 76 (2): 348-360. ISSN: 0021-8790

**URL:** <http://www.blackwell-synergy.com/loi/jae>

**Descriptors:** badgers (*Meles meles*), bovine tuberculosis, *Mycobacterium bovis*, relationship between TB and badger ecology, animal demographics and behaviors, movement, pathogen excretion, individual and groups, stable social structure, males and females, culling may be negative, Britain.

Vicente, Joaquin; Hofle, Ursula; Garrido, Joseba M.; Fernandez de Maria, Isabel G.; Acevedo, Pelayo.; Juste, Ramon.; Barral, Marta.; Gortazar, Christian. **Risk factors associated with the prevalence of tuberculosis-like lesions in fenced wild boar and red deer in south central**

**Spain.** *Veterinary Research* (Les-Ulis). 2007; 38 (3): 451-464. ISSN: 0928-4249

**URL:** <http://www.vetres.org/>

**NAL Call Number:** SF602.A5

**Descriptors:** red deer (*Cervus elaphus*), wild boar (*Sus scrofa*), management of large game animals, epidemiology of diseases, complications for the eradication of tuberculosis for livestock, use of watering holes, feeding stations, scrubland, forests effects, habitat use, transmission factors, south central Spain.

## 2006

Abernethy, D.A.; Denny, G.O.; Menzies, F.D.; McGuckian, P.; Honhold, N.; Roberts, A.R. **The Northern Ireland programme for the control and eradication of *Mycobacterium bovis*.** *Veterinary Microbiology*. 2006 Feb. 25; 112

(2-4): 231-237. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, held August 22-26, 2005, Dublin, Ireland.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** Bovine tuberculosis is endemic in Northern Ireland and a comprehensive eradication scheme has been in operation since 1959. The current programme involves annual testing, extensive computerized tracing, short-interval testing of herds contiguous to outbreaks and compulsory slaughter of positive cattle. Despite initial reductions in disease prevalence, eradication has proved elusive and potential explanatory factors include high cattle density and potential for between-herd contact, the impact of exotic diseases on resource priorities, and significant levels of bovine tuberculosis in a wildlife reservoir, the European badger (*Meles meles*). Both the role of the infected bovine and that of the badger in spreading disease have to be addressed to ensure progress towards eradication. Current measures are described and future options for enhancing the programme are outlined.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, disease control, disease control programs, disease surveillance, disease outbreaks, culling animals, herd health, stocking rate, wildlife, disease reservoirs, disease transmission, risk assessment, disease eradication, Northern Ireland.

Barlow, A.M.; Monies, R.J. **Bovine tuberculosis in pigs in Cornwall and the west of England.** *Pig Journal*. 2006; 58: 204-211

**URL:** <http://www.pigjournal.co.uk>

**Descriptors:** badgers, cattle, pigs, historical pattern of mycobacterial infection, wild and domestic pigs, environmental contamination, *Mycobacterium avium* from infected birds, *Mycobacterium bovis* from scavenged dead carcasses or feed and water, ingestion of contaminated milk or milk products, interaction with badgers is a risk, UK

Beran, V.; Matlova, L.; Horvathova, A.; Bartos, M.; Moravkova, M.; Pavlik, I. **Mycobacteria in the animal's environment in the Czech Republic.** *Veterinarski Arhiv*. 2006; 76(Supplement): S33-S39. ISSN: 0372-5480

**URL:** <http://www.vet.hr/vetarhiv>

**NAL Call Number:** 41.8 V6416

**Descriptors:** farm and captive wild animals, environmental mycobacteria, breeding facilities, tanks, fish aquaria, peat as feed supplement, 1389 samples, 29 sites, bacteria cultured, Stonebrink's medium, Herrold's egg yolk medium, Sula's medium, *Mycobacterium avium*, *Mycobacterium fortuitum*, *Mycobacterium gordonae*, *Mycobacterium marinum*, *Mycobacterium flavescens*, zoonotic infections, Czech Republic.

Bourne, F.J.; Donnelly, C.A.; Cox, D.R.; Gettinby, G.; McInerney, J.P.; Morrison, W.I.; Woodroffe, R. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 158 (19): 671-672. ISSN: 0042-4900

**URL:** <http://www.bvapublications.com>

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers, cattle, *Mycobacterium bovis*, wildlife as disease reservoir, culling badgers, disease control policies.

Bourne, F.J.; Donnelly, C.A.; Cox, D.R.; Gettinby, G.; McInerney, J.P.; Morrison, W.I.; Woodroffe, R. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 158 (12): 418. ISSN: 0042-4900

**URL:** <http://www.bvapublications.com>

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, badgers (*Meles meles*), wildlife reservoir for *Mycobacterium bovis*, UK.

Bowen-Davies, J. ***Mycobacterium bovis* in British deer.** *Deer Farming*. 2006; (82): 17-21.

**Descriptors:** deer, *Mycobacterium bovis*, zoonotic infection, active disease surveillance, immunity reactions, lack of diagnostic tests, clinical picture, *Capreolus capreolus*, red deer (*Cervus elaphus*), fallow deer (*Dama dama*), *Muntiacus*, *Mycobacterium bovis*, Britain.

Brook, R.K.; McLachlan, S.M. **Factors influencing farmers' concerns regarding bovine tuberculosis in wildlife and livestock around Riding Mountain National Park.** *Journal of Environmental Management*. 2006; 80 (2): 156-166. ISSN: 0301-4797

**URL:** <http://www.sciencedirect.com/science/journal/03014797>

**NAL Call Number:** HC75.E5J6

**Abstract:** Despite intensive efforts over the last century to eradicate bovine tuberculosis (TB) in North America, several hotspots of infected wildlife and livestock remain, raising concerns that the disease will never be eradicated. The stress and frustration for a farmer caused by having a herd test positive for TB or living in an infected region can be substantial. The goal of this study was to investigate the concerns of farmers around Riding Mountain National Park (RMNP) regarding the presence of TB in wildlife and livestock and conduct an exploratory analysis of causal factors. Data were collected from 786 farmers within 50 km of RMNP using a mail-back questionnaire. Overall, farmers indicated a high level of concern toward diseases in both wildlife and cattle relative to other concerns. The spatial variables that had the greatest influence on TB concern were both the distance of farms to the RMNP boundary and distance of farms to previous cases of TB. The most important aspatial factor associated with high TB concern was the frequency with which farmers observed elk on their land. These results underscore the important differences between 'objective' measures of risk, such as epidemiological estimates of disease prevalence, and subjective measures of disease concern, such as risk perception and acceptability of management actions. Written responses suggest that concerns regarding disease may affect how farmers view wildlife on their land and their relationship with neighbouring protected areas. Management activities that reduce the frequency of elk interactions with farms, but also recognize the complex relationship that farmers have with wildlife and protected areas, will be most effective in mitigating farmer concern regarding this important problem..

**Descriptors:** cattle, elk, wildlife disease reservoirs, disease control programs, bovine tuberculosis, farmers/ranchers concerns, disease risks, private and protected lands, Canada.

Buddle, B.M.; Aldwell, F.E.; Keen, D.L.; Parlane, N.A.; Hamel, K.L.; Lisle, G.W. de. **Oral vaccination of brushtail possums with BCG: investigation into factors that may influence vaccine efficacy and determination of duration of protection.** *New Zealand Veterinary Journal*. 2006; 54 (5): 224-230. ISSN: 0048-0169

**URL:** <http://www.vetjournal.org.nz>

**NAL Call Number:** 41.8 N483

**Descriptors:** brushtail possums, wildlife reservoir for *Mycobacterium bovis* BCG, oral pellets with dead and live bacteria, vaccine, efficacy tested, experimental infection, post challenge aerosol delivery of virulent pathogen, generated resistance.

Buddle, B.M.; Wedlock, D.N.; Denis, M. **Progress in the development of tuberculosis vaccines for cattle and wildlife.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 191-200. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** Vaccination against bovine tuberculosis is likely to become an important disease control strategy in developing countries, which cannot afford a test and slaughter control programme, or in countries which have a wildlife reservoir of *Mycobacterium bovis* infection. In the past decade, considerable progress has been made in the development and evaluation of tuberculosis vaccines for cattle and for a range of wildlife maintenance hosts including possums, badgers, deer and African buffaloes. Experimental challenge systems have been established for the different target species and the resulting disease process has mimicked that seen in the field. In cattle, neonatal vaccination with BCG appeared to be more effective than vaccination of 6-month-old calves and in most situations no other vaccine has been shown to be better than BCG. However, prime-boost strategies involving combinations of BCG with a protein or DNA vaccine, to improve on BCG vaccination alone, have produced very encouraging results. Differential diagnostic tests have been developed using mycobacterial antigens that are only present in virulent *M. bovis* to differentiate between BCG-vaccinated and *M. bovis*-infected cattle. BCG vaccine has been shown to reduce the spread of tuberculous lesions in a range of wildlife species and a prototype oral bait delivery system has been developed. Prospects for the development of improved vaccines against bovine tuberculosis are promising and vaccination approaches could become very valuable in the control and eradication of bovine tuberculosis.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, vaccines, vaccine development, wild animals, wildlife vaccination program, animal diseases, tuberculosis, vaccination, disease control, disease control programs, disease reservoirs, BCG vaccine, virulence, disease diagnosis, diagnostic techniques.

Buxton, David. **Wildlife and the risk to humans and domestic animals: A case for disease surveillance.** *Veterinary*

*Journal*. 2006; 171 (2): 204-205. ISSN: 1090-0233

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623077/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623077/description#description)

**NAL Call Number:** SF601.V484

**Descriptors:** wildlife as disease reservoirs, zoonotic diseases, humans, domestic animals, parasites, bison, wolf, red deer, reindeer, sika deer, elk, *Mycobacterium bovis*, nematodes, *sarcosystis*.

Cagnacci, F.; Massei, G.; Coats, J.; Leeuw, A. de; Cowan, D.P. **Long-lasting systemic bait markers for Eurasian badgers.** *Journal of Wildlife Diseases*. 2006; 42 (4): 892-896. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Descriptors:** badgers (*Meles meles*) long-lasting markers, Rhodamine B, PrIPA, and EtIPA, bait markers around badger setts, serum samples, hair samples, whiskers collected, UK

Caley, P. **Bovine tuberculosis in brushtail possums: models, dogma and data.** *New Zealand Journal of Ecology*. 2006; 30 (1): 25-34. ISSN: 0110-6465

**NAL Call Number:** QH540.N43

**Descriptors:** bovine tuberculosis, *Mycobacterium bovis*, brushtail possum, *Trichosurus vulpecula*, 3 disease models evaluated, issue of spatial clustering of possums, concerns for loss of data sets, possum management, wild animal disease reservoir, New Zealand.

Clarke, K.R.; Firlgerald, S.D.; Hattey, J.A.; Bolin, C.A.; Berry, D.E.; Church, S.V.; Reed, W.M. **Experimental inoculation of wild turkeys (*Meleagris gallopavo*) with *Mycobacterium bovis*.** *Avian Diseases*. 2006; 50 (1): 131-134. ISSN: 0005-2086

**URL:** <http://avdi.allenpress.com/avdionline/?request=index-html>

**NAL Call Number:** 41.8 AV5

**Descriptors:** susceptibility of birds to *Mycobacterium bovis*, wild turkeys, experimental inoculation, trachea and oral routes, fecal cultures negatives, 30days, 60 days, 90 days, sampling, passive persistence, no lesions, minimal disease reservoir.

Corner, L.A.L. **The role of wild animal populations in the epidemiology of tuberculosis in domestic animals: how to assess the risk.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 303-312. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** Tuberculosis is present in wild animal populations in North America, Europe, Africa and New Zealand. Some wild animal populations are a source of infection for domestic livestock and humans. An understanding of the potential of each wild animal population as a reservoir of infection for domestic animals is reached by determining the nature of the disease in each wild animal species, the routes of infection for domestic species and the risk of domestic animals encountering an infectious dose. The mere presence of infection in a wild animal population does not of itself provide evidence of a significant wildlife reservoir. Although at times counterintuitive, wildlife populations with high disease prevalence may not necessarily have a role in the epidemiology of disease in domestic livestock. The key concepts used in deciding whether an infected wild animal population is involved in the epidemiology of tuberculosis in domestic livestock is illustrated by reference to six well-researched cases: the feral pig (*Suis scrofa*) and feral Asian water buffalo (*Bubalus bubalis*) in Australia, white tailed deer (*Odocoileus virginianus*) in Michigan, and the brushtail possum (*Trichosurus vulpecula*) and other species, such as the ferret (*Mustela furo*), in New Zealand. A detailed analysis of *Mycobacterium bovis* infection in the Eurasian badger (*Meles meles*) in Ireland and their role as a reservoir of infection for cattle is also presented.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, wild animals, wildlife, animal diseases, tuberculosis, alternative hosts, risk assessment, disease transmission, infection, disease prevalence, disease outbreaks, case studies, disease reservoirs.

Coryn, H.D. **Badgers, TB and modern farming practice.** *Veterinary Record*. 2006; 158 (17): 604. ISSN: 0042-4900. Note: Correspondence.

**URL:** <http://www.bvapublications.com>

**NAL Call Number:** 41.8 V641

**Descriptors:** cattle, badgers (*Meles meles*), *Mycobacterium bovis*, relationship with modern farming practices, UK.

Costello, E.; Flynn, O.; Quigley, F.; O'Grady, D.; Griffin, J.; Clegg, T.; McGrath, G. **Genotyping of *Mycobacterium bovis* isolates from badgers in four areas of the Republic of Ireland by restriction fragment length polymorphism analysis.** *Veterinary Record* (London). 2006; 159(19): 619-623. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/archive/>

**NAL Call Number:** 41.8 V641

**Descriptors:** *Mycobacterium bovis* isolates from badgers, tissue sampling of 2310 animals, RFLP analysis with IS6110, polymorphic GC-rich sequence (PGRS), direct repeat sequence (DR) probes, 398 isolates, 52 RFLP types identifies, movement of badgers between territories, Republic of Ireland.

Costello, E.; Flynn, O.; Quigley, F.; O'Grady, D.; Griffin, J.; Clegg, T.; McGrath, G. **Genotyping of *Mycobacterium bovis* isolates from badgers in four areas of the Republic of Ireland by restriction fragment length polymorphism analysis.** *Veterinary Record* (London). 2006 Nov 4; 159 (19): 619-623. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/>

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers, *Meles Meles*, *Mycobacterium bovis* strains, genotype, restriction fragment length polymorphism, epidemiology, Ireland.

Crawford, G.C.; Ziccardi, M.H.; Gonzales, B.J.; Woods, L.M.; Fischer, J.K.; Manning, E.J.B.; Mazet, J.A.K. ***Mycobacterium avium* subspecies *paratuberculosis* and *Mycobacterium avium* subsp. *avium* infections in a tule elk (*Cervus elaphus nannodes*) herd.** *Journal of Wildlife Diseases*. 2006; 42 (4): 715-723. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Abstract:** Between 2 August and 22 September 2000, 37 hunter-killed tule elk (*Cervus elaphus nannodes*) were evaluated at the Grizzly Island Wildlife Area, California, USA, for evidence of paratuberculosis. Elk were examined post-mortem, and tissue and fecal samples were submitted for radiometric mycobacterial culture. Acid-fast isolates were identified by a multiplex polymerase chain reaction (PCR) that discriminates among members of the *Mycobacterium avium* complex (MAC). Histopathologic evaluations were completed, and animals were tested for antibodies using a Johne's enzyme-linked immunosorbent assay (ELISA) and agar gel immunodiffusion. In addition, 104 fecal samples from tule elk remaining in the herd were collected from the ground and submitted for radiometric mycobacterial culture. No gross lesions were detected in any of the hunter-killed animals. *Mycobacterium avium* subsp. *paratuberculosis* (MAP) was cultured once from ileocecal tissue of one adult elk and was determined to be a strain (A18) found commonly in infected cattle. One or more isolates of *Mycobacterium avium* subsp. *avium* (MAA) were isolated from tissues of five additional adult elk. Gastrointestinal tract and lymph node tissues from 17 of the 37 elk (46%) examined had histopathologic lesions commonly seen with mycobacterial infection; however, acid-fast bacteria were not observed. All MAC infections were detected from adult elk ( $P=0.023$ ). In adult elk, a statistically significant association was found between MAA infection and ELISA sample-to-positive ratio ( $S/P \geq 0.25$  ( $P=0.021$ ); four of five MAA culture-positive elk tested positive by ELISA. Sensitivity and specificity of ELISA  $S/P \geq 0.25$  for detection of MAA in adult elk were 50% and 93%, respectively. No significant associations were found between MAC infection and sex or histopathologic lesions. Bacteriologic culture confirmed infection with MAP and MAA in this asymptomatic tule elk herd. The Johne's ELISA was useful in signaling mycobacterial infection on a population basis but could not discriminate between MAA and MAP antibodies. The multiplex PCR was useful in discriminating among the closely related species belonging to MAC..

**Descriptors:** tule elk, *Cervus elaphus nannodes*, *Mycobacterium avium*, *Mycobacterium avium* subsp *paratuberculosis*, red deer, disease survey, PCR, ELISA, California, USA.

Daly, M.; Diegel, K.L.; Fitzgerald, S.D.; Schooley, A.; Berry, D.E.; Kaneene, J.B. **Patterns of antimicrobial susceptibility in Michigan wildlife and bovine isolates of *Mycobacterium bovis*.** *Journal of Veterinary Diagnostic Investigation*. 2006 July; 18 (4): 401-404. ISSN: 1040-6387.

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** *Mycobacterium bovis*, bacterial isolates, wildlife and bovine sources, susceptibility to antibacterial

compounds.

Daykin, J.; Pepper, B.; Green, R.; Howe, C.; Swarbrick, O. **Badger culling consultation.** *Veterinary Record* (London). 2006; 159 (7): 220. ISSN: 0042-4900

**URL:** <http://www.bvapublications.com>

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers, cattle, *Mycobacterium bovis*, bovine tuberculosis, rules, UK.

Delahay, R.J.; Smith, G.C.; Barlow, A.M.; Walker, N.; Harris, A.; Clifton-Hadley, R.S.; Cheeseman, C.L. **Bovine tuberculosis infection in wild mammals in the south-west region of England: a survey of prevalence and a semi-quantitative assessment of the relative risks to cattle.** *Veterinary Journal*. 2007; 173 (2): 287-301. ISSN: 1090-0233

**URL:** <http://www.sciencedirect.com/science/journal/10900233>

**Descriptors:** badgers (*Meles meles*); pathogen survey of wild mammals; post mortem examination and tissue collection; microbiological culture; infection found in: fox, stoat, polecat, common shrew, yellow-necked mouse, wood mouse, field vole, grey squirrel, roe deer, red deer, fallow deer and muntjac; deer species carried a significant level of bacteria, UK.

Donnelly, C.A.; Woodroffe, R.; Cox, D.R.; Bourne, F.J.; Cheeseman, C.L.; Clifton-Hadley, R.S.; Wei, G.; Gettinby, G.; Gilks P.; Jenkins H. **Positive and negative effects of widespread badger culling on tuberculosis in cattle** [electronic resource]. *Nature*. 2006 Feb. 16; 439 (7078): 843-846. ISSN: 1476-9679

**URL:** <http://dx.doi.org/10.1038/nature04454>

**NAL Call Number:** 472 N21

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, disease control, disease reservoirs, badgers, *Meles meles*, culling animals, disease prevalence, disease incidence, geographical distribution, United Kingdom.

Duckworth, J.A.; Byrom, A.E.; Fisher, P.; Horn, C. **Pest control: Does the answer lie in new biotechnologies?** In: R.B. Allen and W.G. Lee. *Ecological Studies*. Springer-Verlag Berlin, Berlin. 2006; 186: 421-434. ISSN: 0070-8356. ISBN: 3540300228

**URL:** <http://www.springer.com/dal/home/new+%26+forthcoming+titles+%28default%29?SGWID=1-40356-22-92732336-0>

**NAL Call Number:** QH540.E288

**Descriptors:** pest control, zoonotic disease control, wildlife management, population control, disease control and prevention, mammals, viral diseases, microorganisms, foxes, rates, skunks, weasels, brushtail possums and raccoons, immunology, mycobacterial infection, New Zealand.

Everett, R.E. **Eradication of bovine TB: learning from other countries.** *Veterinary Record* (London). 2006; 158 (18): 640. ISSN: 0042-4900

**URL:** <http://www.bvapublications.com>

**NAL Call Number:** 41.8 V641

**Descriptors:** buffalo, cattle, bovine tuberculosis, *Mycobacterium bovis*, disease control and eradication, Australia, New South Wales, Northern Territory, Queensland, Western Australia.

Fontenot, D.K.; Terrell, S.P.; Malakooti, K.; Medina, S. **Health assessment of the Guam rail (*Gallirallus owstoni*) population in the Guam rail recovery program.** *Journal of Avian Medicine and Surgery*. 2006; 20 (4): 225-233. ISSN: 1082-6742

**URL:** <http://www.bioone.org/perlserv/?request=get-archive&issn=1082-6742>

**NAL Call Number:** SF994.J6

**Descriptors:** captive island animals, Guam rail (*Gallirallus owstoni*), health assessment for pre-release, domestic chickens, blood counts, plasma analysis, ELISA for *Mycobacterium bovis*, enteric pathogens, Guam, Rota.

Gallagher, J.; Muirhead, R.H.; Turnbull, A.T.; Davies, J.I.; Ashton, W.L.G.; Smith, J.; Daykin, J.; McDiarmid, A. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 158 (9): 310-311. ISSN: 0042-4900

**URL:** <http://www.bvapublications.com>

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers, (*Meles meles*), cattle, *Mycobacterium bovis*, disease eradication and control, government policies, UK.

Gallagher, J.; Muirhead, R.H.; Turnbull, A.T.; Davies, J.I.; Ashton, W.L.G.; Smith, J.; Daykin, J.; McDiarmid, A. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 159 (7): 220. ISSN: 0042-4900

**URL:** <http://www.bvapublications.com>

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers, *Mycobacterium bovis*, bovine tuberculosis, policies, wildlife disease reservoirs, disease transmission, culling of badgers.

Gallagher, J.; Muirhead, R.H.; Turnbull, A.T.; Davies, J.I.; Ashton, W.L.G.; Smith, J.; Daykin, J.; McDiarmid, A. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 158 (15): 524. ISSN: 0042-4900

**URL:** <http://www.bvapublications.com>

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium tuberculosis*.

Glawischnig, W.; Steineck, T.; Spargser, J. **Infections caused by *Mycobacterium avium* subspecies *avium*, *hominissuis*, and *paratuberculosis* in free-ranging red deer (*Cervus elaphus hippelaphus*) in Austria, 2001-2004.** *Journal of Wildlife Diseases*. 2006; 42 (4): 724-731. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Descriptors:** free-ranging red deer (*Cervus elaphus hippelaphus*), clinical picture, postmortem exam, lymphadenitis, nodular lesion in thickened intestinal wall, mixed infections, *Mycobacterium avium* ssp *avium*, *Mycobacterium avium* subsp *hominissuis*; PCR, Austria.

Good, M. **Bovine tuberculosis eradication in Ireland.** *Irish Veterinary Journal*. 2006; 59 (3): 154-162. ISSN: 0368-0762

**URL:** <http://www.veterinary-ireland.org>

**NAL Call Number:** 41.8 IR4

**Descriptors:** cattle, bovine tuberculosis, eradication program started in 1950, European trading condition for live animals, reduction in disease levels, *Mycobacterium bovis* levels, wild badgers (*Meles meles*), disease reservoirs, disease transmission, disease prevention and control in wild animals, Ireland.

Griffin, J.F.T.; Rodgers, C.R.; Liggett, S.; Mackintosh, C.G. **Tuberculosis in ruminants: characteristics of intra-tonsillar *Mycobacterium bovis* infection models in cattle and deer.** *Tuberculosis*. 2006; 86 (6): 404-418. ISSN: 1472-9792

**URL:** <http://www.sciencedirect.com/science/journal/14729792>

**Descriptors:** cattle, red deer (*Cervus elaphus*), *Mycobacterium bovis*, intra-tonsillar, immunity reactions, immunological reactions, resistance to disease, susceptibility to disease, species comparison.

Javed, Muhammad-Tariq; Usman, Mahmood; Irfan, Muhammad; Cagiola, Monica. **A study on tuberculosis in buffaloes: some epidemiological aspects, along with haematological and serum protein changes.** *Veterinarski Arhiv*. 2006; 76 (3): 193-206. ISSN: 0372-5480

**NAL Call Number:** 41.8 V6416

**Descriptors:** buffalo, bovine tuberculosis, *Mycobacterium bovis*, blood chemistry changes, blood cell changes, red cells, lymphocytes, eosinophils, leukocytes, monocytes, immune system, globulin.

Jolles, Anna E.; Cooper, David V.; Levin, Simon A. **Hidden effects of chronic tuberculosis in African buffalo.** *Ecology* (Washington DC). 2005; 86 (9): 2358-2364. ISSN: 0012-9658

**NAL Call Number:** 410 Ec7

**Descriptors:** African buffalo (*Syncerus caffer*), population level effects of pathogens in wild host populations, *Mycobacterium bovis*, disease seems mild and chronic, affects adult survival and fecundity, Hluhluwe iMfolozi Park, South Africa.

Hancox, M. **Confusion over cattle tuberculosis.** *Letters in Applied Microbiology*. 2006; 43 (2): 236. ISSN: 0266-8254

**URL:** <http://www.blackwell-synergy.com/doi/pdf/10.1111/j.1472-765X.2006.01959.x>

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium tuberculosis*, species differences in lung lesions, transmission between cattle and badgers, routes of infection.

Heisey, D.M.; Joly, D.O.; Messier, F. **The fitting of general force-of-infection models to wildlife disease prevalence data.** *Ecology*. 2006 Sept; 87 (9): 2356-2365. ISSN: 0012-9658

**NAL Call Number:** 410 Ec7

**Descriptors:** wildlife diseases, disease prevalence, animal disease models, statistical models, mathematical models, equations, bison, *Mycobacterium tuberculosis*, bovine tuberculosis, case studies.

Henault, S.; Karoui, C.; Boschioli, M.L. **A PCR-based method for tuberculosis detection in wildlife.** *New Diagnostic Technology: Applications in Animal Health and Biologics Control, Saint Malo, France, 3-5-October, 2005*. 2006; 123-132. ISBN: 3805581165; 9783805581165

**Descriptors:** wildlife, disease reservoir for *Mycobacterium bovis*, transmission between domestic animals and wildlife species, alternative method for rapid screening, epidemiological species, PCR diagnostic method.

Hermoso de Mendoza, J.; Parra, A.; Tato, A.; Alonso, J.M.; Rey, J.M.; Pena, J.; Garcia-Sanchez, A.; Larrasa, J.; Teixido, J.; Manzano, G. **Bovine tuberculosis in wild boar (*Sus scrofa*), red deer (*Cervus elaphus*) and cattle (*Bos taurus*) in a Mediterranean ecosystem (1992-2004).** *Preventive Veterinary Medicine*. 2006 May 17; 74 (2-3): 239-247. ISSN: 0167-5877

**URL:** <http://dx.doi.org/10.1016/j.prevetmed.2005.10.005>

**NAL Call Number:** SF601.P7

**Descriptors:** cattle, cattle diseases, wild boars, *Sus scrofa*, red deer, *Cervus elaphus*, paratuberculosis, *Mycobacterium bovis*; epidemiological studies, disease transmission, wildlife livestock relations, game animals, risk assessment, ecosystems, disease surveillance, disease prevalence, disease detection, wildlife management, Spain.

Hofmeyr, M.S. **Disease-free buffalo breeding project.** *Small Animal and Exotics. Proceedings of the North American Veterinary Conference-Volume 20, Orlando, Florida, USA, 7-11 January, 2006*. 2006: 1802-1803.

**URL:** <http://www.tnavc.org>

**Descriptors:** African buffalo (*Syncerus caffer*), Brucella, *Mycobacterium tuberculosis*, *Theileria*, South Africa.

Jolles, A.E.; Etienne, R.S.; Olff, H. **Independent and competing disease risks: implications for host populations in variable environments.** *American Naturalist*. 2006; 167 (5): 745-757. ISSN: 0003-0147

**URL:** <http://www.journals.uchicago.edu/AN/journal>

**NAL Call Number:** 470 AM36

**Abstract:** Disease models usually assume disease to act independently of other mortality-and morbidity-causing factors. Alternatively, disease may function as a competing risk factor, for example, killing already moribund hosts. Using tuberculosis (TB) in African buffalo as a model system, we explore consequences of competing or independent disease effects for host population dynamics. We include scenarios with density-dependent and density-independent effects of environmental variation, exemplified by variable food availability (driven by rainfall) and catastrophic droughts, respectively. Independent disease effects reduce population size linearly with prevalence, irrespective of the nature of environmental variation. Competing disease risks alter population size only if density-independent variation is present; then, disease reduces population size nonlinearly. Field data indicate that the net effect of TB on buffalo likely falls between the extremes of total independence and competition with other risk factors: TB increases mortality and decreases fecundity in some prime-aged buffalo, suggesting independent disease risks in these individuals, while similar disease effects in senescent buffalo may act as competing risks. Moreover, increased survival and fecundity of TB-negative buffalo may compensate for some disease-related losses. Model assumptions on independent or competing disease risks and environmental variability should be considered explicitly when assessing disease effects on wildlife populations..

**Descriptors:** wild life populations, African buffalo (*Syncerus caffer*) *Mycobacterium*, death rate, competing and independent disease effects, disease risks, environmental effects, statistical model.

Kirberger, Robert M.; Keet, Dewald F.; Wagner, Wencke M. **Radiologic abnormalities of the appendicular skeleton of the lion (*panthera leo*): incidental findings and *Mycobacterium bovis*-induced changes.** *Veterinary Radiology and Ultrasound*. 2006 Mar; 47 (2) 145-152. ISSN: 1058-8183

**URL:** <http://dx.doi.org/10.1111/j.1740-8261.2006.00121.x>

**NAL Call Number:** SF757.8.A4

**Descriptors:** *Panthera leo*, musculoskeletal system, limb bones, bone fractures, mycobacterial diseases, *Mycobacterium bovis*, tuberculosis, animal injuries, joint diseases, lesions animal, diagnostic techniques, radiography, animal age.

Kruuk, H. **Control of badgers and bovine TB.** *Veterinary Record* (London). 2006; 158 (13): 455. ISSN: 0042-4900. Note: Correspondence.

**URL:** <http://www.bvapublications.com>

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, disease, control, wildlife as a disease reservoir, UK.

Lesellier, S.; Palmer, S.; Dalley, D.J.; Dave, D.; Johnson, L.; Hewinson, R.G.; Chambers, M.A. **The safety and immunogenicity of Bacillus Calmette-Guerin (BCG) vaccine in European badgers (*Meles meles*).** *Veterinary Immunology and Immunopathology*. 2006 July 15; 112 (1-2): 24-37. ISSN: 0165-2427

**URL:** <http://dx.doi.org/10.1016/j.vetimm.2006.03.009>

**NAL Call Number:** SF757.2.V38

**Abstract:** European badgers (*Meles meles*) are a wildlife reservoir for *Mycobacterium bovis* (*M. bovis*) in Great Britain (GB) and the Republic of Ireland and therefore constitute a potential source of infection for cattle. Reduction of badger densities in the Republic of Ireland has resulted in an associated reduction in the risk of a herd break-down with bovine tuberculosis and a study to determine whether this is also the case in GB has been running since 1997. If badgers are a significant source of *M. bovis* infection for cattle, vaccinating badgers with Bacillus Calmette-Guerin (BCG) might prove to be a long term, cost-effective strategy for controlling bovine tuberculosis whilst preserving badger populations. As a first step towards BCG vaccination of wild badgers, it was necessary to demonstrate safety of the vaccine in captive badgers. Therefore, captive badgers were vaccinated with a commercial source of BCG that is already licensed for administration to humans in GB--BCG Danish SSI. Using a protocol prescribed by the Veterinary Medicines Directorate (VMD) of GB, badgers were vaccinated with two consecutive doses of BCG via either the subcutaneous (s.c.) or intra-muscular (i.m.) routes. The first dose was high, ranging from 16 to 22 x 10(7) colony-forming units (CFU), and was followed 15 weeks later by a lower dose in the range of 4-7 x 10(5) CFU. Local reaction at the site of injection and general responses (body temperature, haematology and blood serum chemistry), behaviour and excretion of BCG were monitored for 28 weeks from the time of the first vaccination. The only side-effect observed was the occurrence of localised swelling at the site of BCG injection that disappeared 48 days after i.m. vaccination but persisted longer in the group vaccinated by the s.c. route. Immunological responses were measured at regular intervals. Strong cellular responses were observed 13 days after the first vaccination, which persisted for 76 days. The lower dose induced a weaker and shorter-lived response.

**Descriptors:** European badgers (*Meles meles*), wildlife reservoir, *Mycobacterium bovis* (*M. bovis*), vaccinating badgers with *Mycobacterium bovis* Bacillus Calmette-Guerin (BCG), dose levels, subcutaneous injection, intro-muscular injection, reaction to vaccination, side effects, cellular responses tracked, potential long term, cost-effective strategy for controlling bovine tuberculosis, preservation of badger populations. Great Britain (GB), Republic of Ireland

Macdonald, D.W.; Riordan, P.; Mathews, F. **Biological hurdles to the control of TB in cattle: a test of two hypotheses concerning wildlife to explain the failure of control.** *Biological Conservation*. 2006; 131 (2): 268-286. ISSN: 0006-3207

**URL:** <http://www.sciencedirect.com/science/journal/00063207>

**NAL Call Number:** S900.B5

**Descriptors:** badgers (*Meles meles*), wildlife as disease reservoirs, culling badgers, disease transmission, *Mycobacterium bovis*, bovine tuberculosis, control programs, disease surveillance, Britain, United Kingdom.

Marco, V. di; Russo, M.; Tomaselli, A.; Calabro, A.; Leonardi, E.; Salerno, A.; Iozzia, G.; Reale, S.; Guarda, F.; Capucchio, M.T. **Anatomia patologica diffusione e persistenza della tubercolosi nel suino nero del Parco dei Nebrodi studio preliminare.** [Diffusion and persistence of tuberculosis in Nebrodi's feral black pig (Messina):

**preliminary data.]** *Summa, Animalia da Reddito*. 2006; 1 (3): 37-42. ISSN: 1125-6745. Note: In Italian with an English summary.

**Descriptors:** Nebrodi's feral black pigs, tuberculosis, *Mycobacterium bovis*, *Mycobacterium avium*, disease eradication, disease levels in 969 wild pig carcasses, wild animals as disease reservoirs, Italy.

Martin-Atance, P.; Leon-Vizcaino, L.; Palomares, F.; Revilla, E.; Gonzalez-Candela, M.; Calzada, J.; Cubero-Pablo, M.J.; Delibes, M. **Antibodies to *Mycobacterium bovis* in wild carnivores from Donana National Park (Spain).** *Journal of Wildlife Diseases*. 2006; 42 (3): 704-708. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Abstract:** We conducted a retrospective serologic survey for antibodies against the MPB70 protein of *Mycobacterium bovis* in wild carnivores from Donana National Park (southwestern Spain). Serum samples from 118 red foxes (*Vulpes*), 39 Iberian lynx (*Lynx pardinus*), 31 Eurasian badgers (*Meles*), five Egyptian mongoose (*Herpestes ichneumon*), four European genet (*Genetta*), and one Eurasian otter (*Lutra*) were analyzed using an indirect competitive enzyme-linked immunoassay. Antibodies against the MPB70 protein of *M. bovis* were detected in seven badgers, five foxes, and one lynx. The frequency of positive animals was significantly higher in badger (23%) than in lynx (3%) and fox (4%). Antibodies were not detected in other species. Annual antibody frequency peaked at 38% in badgers and 11% for red fox. These species may contribute to persistence of bovine tuberculosis in Donana..

**Descriptors:** carnivores, badgers (*Meles meles*), foxes (*Vulpes vulpes*), lynx (*Lynx pardinus*), European genet (*Genetta*), Egyptian mongoose, (*Herpestes ichneumon*), otter (*Lutra lutra*), *Mycobacterium bovis*, antibody detection, antibody tests, disease surveillance, ELISA, seroepidemiology, zoonotic infections, wildlife as a disease reservoir, Spain.

Michel, A.L.; Bengis, R.G.; Keet, D.F.; Hofmeyr, M.; de Klerk, L.M.; Cross, P.C.; Jolles, A.E.; Cooper, D.; Whyte, I.J.; Buss, P. **Wildlife tuberculosis in South African conservation areas: implications and challenges.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 91-100. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** Tuberculosis, caused by *Mycobacterium bovis*, was first diagnosed in African buffalo in South Africa's Kruger National Park in 1990. Over the past 15 years the disease has spread northwards leaving only the most northern buffalo herds unaffected. Evidence suggests that 10 other small and large mammalian species, including large predators, are spillover hosts. Wildlife tuberculosis has also been diagnosed in several adjacent private game reserves and in the Hluhluwe-iMfolozi Park, the third largest game reserve in South Africa. The tuberculosis epidemic has a number of implications, for which the full effect of some might only be seen in the long-term. Potential negative long-term effects on the population dynamics of certain social animal species and the direct threat for the survival of endangered species pose particular problems for wildlife conservationists. On the other hand, the risk of spillover infection to neighboring communal cattle raises concerns about human health at the wildlife-livestock-human interface, not only along the western boundary of Kruger National Park, but also with regards to the joint development of the Greater Limpopo Trans-frontier Conservation Area with Zimbabwe and Mozambique. From an economic point of view, wildlife tuberculosis has resulted in national and international trade restrictions for affected species. The lack of diagnostic tools for most species and the absence of an effective vaccine make it currently impossible to contain and control this disease within an infected free-ranging ecosystem. Veterinary researchers and policy-makers have recognized the need to intensify research on this disease and the need to develop tools for control, initially targeting buffalo and lion.

**Descriptors:** African buffalo, (*Syncerus caffer*), wild animals, *Mycobacterium bovis*, animal pathogenic bacteria, tuberculosis, wildlife, animal diseases, conservation areas, disease outbreaks, alternative hosts, disease transmission, endangered species, literature reviews, lions (*Panthera leo*), disease control, disease reservoirs, South Africa, Zimbabwe, Mozambique.

Miller, R.A.; Kaneene, J.B. **Evaluation of historical factors influencing the occurrence and distribution of *Mycobacterium bovis* infection among wildlife in Michigan.** *American Journal of Veterinary Research*. 2006 Apr; 67 (4): 604-615. ISSN: 0002-9645.

**URL:** <http://avmajournals.avma.org/loi/ajvr?cookieSet=1>

**NAL Call Number:** 41.8 Am3A

**Descriptors:** cattle, white tailed deer, *Mycobacterium bovis*, bovine tuberculosis, disease reservoirs, spatial distribution, disease outbreaks, *Odocoileus virginianus*, temporal variation, risk factors, disease prevalence, wildlife livestock relations, population density, population size, environmental factors, animal husbandry, wildlife management, ribotypes, zoonoses, Michigan.

More, S.J.; Collins, J.D.; Gormley, E.; Good, M.; Skuce, R.A.; Pollock, J.M. **4th International Conference on *Mycobacterium bovis*: workshop reports.** *Veterinary Microbiology*. 2006; 112 (2/4): 383-391. ISSN: 0378-1135. Note: Special issue: S.J. More; J.D. Collins; E. Gormley; M. Good; R.A. Skuce; J.M. Pollock (editors). *Proceedings of the 4th International Conference on Mycobacterium bovis, Dublin, Ireland, 22-26 August 2005*.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** conference workshop reports, policy, strategy, *Mycobacterium bovis*, disease control, disease eradication programs, diagnosis, molecular epidemiology, wild animals as disease reservoirs, vaccines, vaccination of animals, cattle, livestock.

Naranjo, V.; Ayoubi, P.; Vicente, J.; Ruiz-Fons, F.; Gortazar, C.; Kocan, K.M.; De la Fuente, J. **Characterization of selected genes upregulated in non-tuberculous European wild boar as possible correlates of resistance to *Mycobacterium bovis* infection.** *Veterinary Microbiology*. 2006 Aug 25; 116 (1-3): 224-231. ISSN: 0378-1135

**URL:** <http://dx.doi.org/10.1016/j.vetmic.2006.03.013>

**NAL Call Number:** SF601.V44

**Abstract:** Bovine tuberculosis (bTB), caused by *Mycobacterium bovis* (*Mycobacterium tuberculosis* complex), is a zoonotic disease that affects cattle and wildlife worldwide. These animal hosts can serve as reservoirs of infection, thus increasing the risk of human exposure and infection. In this study we quantified by RNA macroarray fluorescent hybridization and real-time RT-PCR the mRNA levels of genes differentially expressed in oropharyngeal tonsils and mandibular lymph nodes of three and seven individual non-tuberculous and tuberculous wild boars naturally exposed to *M. bovis*, respectively. These results demonstrated upregulation of two genes, complement component 3 (C3) and methylmalonyl-CoA mutase (MUT), in the non-tuberculous wild boars. These upregulated genes may contribute to resistance of wild boars to bTB by modifying the innate immunity, which limits the ability of the mycobacterium to infect and persist within macrophages. The C3 and MUT genes, therefore, are likely to be good candidates to study as markers of bTB resistance using functional genomics in animal model systems. Identification of genes upregulated in wild animals resistant to bTB contributes to our understanding of the mechanisms of protective immunity and resistance to mycobacterial organisms.

**Descriptors:** *Mycobacterium bovis*, wild boars, wildlife disease reservoir, up regulated genes, resistant of boars to tuberculosis, limits *Mycobacterium* to infect and persist in macrophages.

Naranjo, Victoria; Hofle, Ursula; Vicente, Joaquin; Martin, M Paz; Ruiz Fons, Francisco; Gortazar, Christian; Kocan, Katherine M.; de la Fuente, Jose. **Genes differentially expressed in oropharyngeal tonsils and mandibular lymph nodes of tuberculous and nontuberculous European wild boars naturally exposed to *Mycobacterium bovis*.** *FEMS Immunology and Medical Microbiology*. 2006; 46 (2): 298-312. ISSN: 0928-8244

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0928-8244&site=1>

**NAL Call Number:** QR180.F46

**Descriptors:** *Mycobacterium bovis* (*Mycobacterium tuberculosis* complex), zoonotic disease, host/pathogen interactions, differential gene expression analysis, suppression-subtractive hybridization, oropharyngeal tonsils, mandibular lymph nodes, field samples of tuberculous and non-tuberculosis European wild boars, real-time PCR, semiquantitative reverse transcriptase PCR of selected genes, modulation of gene expression by mycobacterial infection, protective immunity, Spain.

Nishi, J.S.; Shury, T.; Elkin, B.T. **Wildlife reservoirs for bovine tuberculosis (*Mycobacterium bovis*) in Canada: strategies for management and research.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 325-338. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** In Canada, there are two known regional foci where wildlife populations are infected with bovine tuberculosis (*Mycobacterium bovis*) and considered to be disease reservoirs. Free-ranging populations of wood bison (*Bison bison athabasca*) in and around Wood Buffalo National Park (WBNP) and wapiti (*Cervus elaphus manitobensis*) in and around Riding Mountain National Park (RMNP) are infected with bovine tuberculosis. In this paper, we provide an overview of these diseased wild ungulate populations and the complexities of attempting to manage issues relating to bovine tuberculosis in and around protected areas. We do not describe the quantitative science and epidemiological data in detail from these case histories, but instead compare and contrast these two cases from a broader perspective. This is achieved by reviewing the context and process by which a diverse group of stakeholders engage and develop strategies to address the controversial problems that diseased wildlife populations often present. We suggest that understanding the factors that drive the strategic-level management processes is equally important for addressing a wildlife disease problem as the tactical-level issues, such as design and implementation of technically sound field research and management programs. Understanding the experiences within the WBNP and RMNP areas, particularly the strategies that have failed or succeeded, may prove useful to understanding and improving management approaches when wildlife are infected with *M. bovis*. Applying this understanding is consistent with the principles of adaptive management in which we learn from previous experiences to develop better strategies for the future.

**Descriptors:** cattle, food animals, *Mycobacterium bovis*, wood bison (*Bison bison athabasca*), Wood Buffalo National Park, wapiti (*Cervus elaphus manitobensis*), Riding Mountain National Park, diseased wild ungulate populations, disease management issues in protected areas, how to approach strategic level management processes, disease vectors, disease transmission, control programs, literature reviews, wildlife management, wild animals, wildlife, animal diseases, tuberculosis, alternative hosts, disease outbreaks, disease transmission, conservation areas, case studies, disease control programs, disease reservoirs, Alberta, Canada.

O'Brien, D.J.; Schmitt, S.M.; Fitzgerald, S.D.; Berry, D.E.; Hickling, G.J. **Managing the wildlife reservoir of *Mycobacterium bovis*: The Michigan, USA, experience.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 313-323. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** Historical, social and economic factors combined to provide a focus where bovine tuberculosis has become established in free-ranging wildlife in northeastern lower Michigan. White-tailed deer, the primary reservoir and maintenance host of tuberculosis, are highly valued by the public, and particularly hunters, for cultural and economic reasons. Since 1995, significant progress has been made in defining and reducing the reservoir of tuberculosis in deer. As yet, no other wildlife species has been shown to play an epidemiologically important role in the disease cycle. The importance of deer and deer hunting to Michigan has uniquely shaped tuberculosis control policies, and poses ongoing challenges as wildlife managers strive to maintain momentum for broad control strategies, and develop focused strategies that are publicly acceptable. Even if momentum and funding can be maintained, tuberculosis will likely continue to be present for a decade or longer. Thus, cattle producers waiting for tuberculosis to be eradicated from wildlife to eliminate risks to their herds and markets face disappointment for the foreseeable future. Such unrealistic expectations also place Michigan's federal tuberculosis accreditation status at perpetual risk. Accredited free status is unlikely to be regained without accompanying changes in cattle management. In Michigan, management of tuberculosis has clearly demonstrated that social issues and public approval are likely to be the critical limiting factors in control.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, wildlife management, deer, wild animals, wildlife, tuberculosis, alternative hosts, disease outbreaks, disease transmission, case studies, social barriers, public opinions, sport hunting, disease control programs, disease control programs, disease reservoirs, Michigan.

Palmer, M.V.; Whipple, D.L. **Survival of *Mycobacterium bovis* on feedstuffs commonly used as supplemental feed for white-tailed deer (*Odocoileus virginianus*).** *Journal of Wildlife Diseases*. 2006; 42 (4): 853-858. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Descriptors:** free-ranging white-tailed deer (*Odocoileus virginianus*), supplemental feeding in winter, testing *M. bovis*

survival in feed (i.e., apples, corn, carrots, sugar beets, potatoes, and hay), varying temperatures, pathogen survived, recommend ending supplemental feeding, Michigan, USA.

Palmer, M.V.; Waters, W.R.; Thacker, T.C.; Stoffregen, W.C.; Thomsen, B.V. **Experimentally induced infection of reindeer (*Rangifer tarandus*) with *Mycobacterium bovis*.** *Journal of Veterinary Diagnostic Investigation*. 2006 Jan; 18 (1): 52-60. ISSN: 1040-6387

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** reindeer, animal diseases, *Mycobacterium bovis*, tuberculosis, epidemiology, disease detection, diagnostic techniques, tuberculin, skin tests, lesions animal, immune response, risk assessment, animal pathology, pathogenicity, comparative cervical test.

Palmer, M.V.; Waters, W.R. **Advances in bovine tuberculosis diagnosis and pathogenesis: what policy makers need to know.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 181-190. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** The mainstay of tuberculosis diagnosis in cattle and deer has been the tuberculin skin test. Recent advances have allowed the incorporation of blood based assays to the diagnostic arsenal for both cattle and deer. Use of defined and specific antigens has allowed for improved specificity of cell mediated assays in both cattle and deer and advances in antibody tests for tuberculosis have potential for use in free-ranging and captive cervid populations. Combined use of blood-based assays with skin testing will require further understanding of the effect of skin testing on the accuracy of blood based assays. Models of experimental infection of cattle have allowed for increased understanding of natural disease pathogenesis. Differences likely exist; however, between cattle and deer in both disease distribution and primary route of inoculation in naturally infected animals.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease diagnosis, pathogenesis, disease course, agricultural policy, health policy, zoonoses, diagnostic techniques, deer, wild animals, animal diseases, tuberculosis, disease transmission, epidemiology, interferons, tuberculin, bacterial antigens.

Parra, A.; Garcia, A.; Inglis, N.F.; Tato, A.; Alonso, J.M.; de Mendoza, M Hermoso; de Mendoza, J Hermoso; Larrasa, J. **An epidemiological evaluation of *Mycobacterium bovis* infections in wild game animals of the Spanish Mediterranean ecosystem.** *Research in Veterinary Science*. 2006; 80 (2): 140-146. ISSN: 0034-5288

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Abstract:** Recreational hunting of indigenous wild artiodactyls has been one of the most lucrative and rapidly growing industries in Western Spain over the last five years. In the absence of careful ecological management, one consequence of the commercial exploitation of this natural resource has been the appearance of outbreaks of infectious disease; most notably bovine tuberculosis. From the outset of the study in 1997, we have observed a steady increase in prevalence of *Mycobacterium bovis* (*M. bovis*) in both species reaching 1.74 (+/-0.17) in deer in 2002 and 2.32 (+/-0.24) in wild boar. The latter species seems to be most severely affected with pulmonary lesions appearing more chronic than those observed in deer. In this study, we describe the epidemiology of *M. bovis* in European wild boar (*Sus scrofa*) and Iberian red deer (*Cervus elaphus hispanicus*) in Extremadura (W. Spain); a region where there are large areas of natural habitat for these species.

**Descriptors:** *Mycobacterium bovis*, European wild boar (*Sus scrofa*), Iberian red deer (*Cervus elaphus hispanicus*), disease levels, epidemiology, Spain.

Pavlik, I.; Trcka, I. **Bovinni tuberkuloza u zvirat v Ceske republice a v ostatnich statech stredni Evropy v letech 1990-2004. [Bovine tuberculosis in animals in the Czech Republic and other Central European countries between 1990 and 2004.]** *Veterinarstvi*. 2006; 56 (5): 294-298. ISSN: 0506-8231. Note: In Czech with an English summary.

**NAL Call Number:** 41.8 V6439

**Descriptors:** cattle, deer, farms, circuses, wild game, zoos, disease surveillance, review of published results, disease occurrence, wild and domestic animals, *Mycobacterium*, *Mycobacterium bovis*, *Mycobacterium africanum*, *Mycobacterium canettii*, *Mycobacterium caprae*, *Mycobacterium pinnipedii*, Czech Republic, 6 Central European

countries.

Pena, Laura; Garcia, Pilar; Angeles-Jimenez, M.; Benito, Alberto; Perez-Alenza, M. Dolores; Sanchez, Belen.

**Histopathological and immunohistochemical findings in lymphoid tissues of the endangered Iberian lynx (*Lynx pardinus*).** *Comparative Immunology Microbiology and Infectious Diseases*. 2006; 29 (2-3): 114-126. ISSN: 0147-9571

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/496/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/496/description#description)

**NAL Call Number:** QR180.C62

**Descriptors:** Iberian lynx (*Lynx pardinus*), survey of causes of death, diseases, pathology, peripheral lymphoid tissues and thymus, neoplasia, tuberculosis, *Mycobacterium bovis*, B and T cell depletion, immune systems.

Ramsey, D.S.L.; Coleman, J.D.; Coleman, M.C.; Horton, P. **The effect of fertility control on the transmission of bovine tuberculosis in wild brushtail possums.** *New Zealand Veterinary Journal*. 2006; 54 (5): 218-223. ISSN: 0048-0169

**URL:** <http://www.vetjournal.org.nz>

**NAL Call Number:** 41.8 N483

**Descriptors:** brushtail possums (*Trichosurus vulpecula*), fertility control on transmission, *Mycobacterium bovis*, sterilization resulted in reduced rates via gonadectomy, in females there was an increase.

Reynolds, D. **TB policy developments.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 5-10. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle. *Mycobacterium bovis*, badgers (*Meles meles*), eradication and control programs, lessons learned, disease distribution, zoonotic infections, UK.

Rishendra Verma; Samir Das. **Zoonotic tuberculosis due to *Mycobacterium bovis* in India.** *Intas Polivet*. 2006; 7 (2): 227-235. ISSN: 0972-1738

**Descriptors:** zoonotic tuberculosis, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, economic losses, humans, animals, wildlife, diagnosis, clinical picture, antibiotic treatment, disease surveillance, zoonotic infections, India.

Rudolph, B.A.; Riley, S.J.; Hickling, G.J.; Frawley, B.J.; Garner, M.S.; Winterstein, S.R. **Regulating hunter baiting for white-tailed deer in Michigan: biological and social considerations.** *Wildlife Society Bulletin*. 2006; 34 (2): 314-321. ISSN: 0091-7648

**URL:** <http://www.wildlife.org/publications>

**NAL Call Number:** SK357.A1W5

**Abstract:** Eradication of bovine tuberculosis (TB) from free-ranging white-tailed deer (*Odocoileus virginianus*) requires mortality rates of infected deer exceed the rate of new infection. Efforts to reduce TB transmission in Michigan, USA, are based on 2 assumptions: (1) deer mortality may be increased through recreational hunting and (2) encounter rates between infected and noninfected deer may be reduced by prohibiting baiting and supplemental feeding. Spatial correlation of TB-infected deer and supplemental feeding sites detected using aerial surveys validated a ban on artificial feeding in Michigan. Similar analysis could not be used to evaluate the effects of a baiting ban because bait distribution was unknown. Furthermore, a ban on deer baiting could confound attempts to increase deer mortality through reduced hunter participation or efficacy. We reviewed the process used to evaluate a strategy for regulating bait use by hunters. This review included an assessment of 5 factors: statewide spatial analysis of apparent TB prevalence, deer intraspecific interactions at bait sites, effects of bait on hunter harvest rates, impacts of disease presence and practice of eradication efforts on hunting participation in the infected area and input from law enforcement personnel. Our analysis suggested that restricting baiting to a limited, consistent region incurred less biological risk than allowing bait to be used statewide and less political risk than a statewide ban..

**Descriptors:** cattle, white tailed deer (*Odocoileus-virginianus*), *Mycobacterium bovis*, feeding wild white-tailed deer, transmission of disease, death rates, intraspecific interactions at bait sites, restricting baiting to a consistent region, feeding regulations, Michigan, USA.

Ryan, T.J.; Livingstone, P.G.; Ramsey, D.S.L.; de Lisle, G.W.; Nugent, G.; Collins, D.M.; Buddle, B.M. **Advances in understanding disease epidemiology and implications for control and eradication of tuberculosis in livestock: the experience from New Zealand.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 211-219. ISSN: 0378-1135.

Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** A deteriorating tuberculosis problem in cattle and deer in New Zealand has been halted and then reversed over the last decade. *Mycobacterium bovis* infection in both wild and domestic animal populations has been controlled. This has been achieved by applying a multi-faceted science-based program. Key features of this have been a comprehensive understanding of the epidemiology of tuberculosis in animals, confidence in sampling wild animal populations, effective application of diagnostic tests in cattle and deer, and the ability to map *M. bovis* genotypes.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control, disease control programs, deer, wildlife, animal diseases, tuberculosis, disease transmission, disease surveillance, diagnostic techniques, disease diagnosis, genotype, microbial genetics, strains, strain differences, pathogen eradication, serodiagnosis, New Zealand.

Scantlebury, M.; Harris, S.; Allcroft, D.J.; Hutchings, M.R. **Individual trade-offs between nutrition and risk of interspecific transmission of disease by grazing: cows, badger latrines and bovine tuberculosis.** *Behaviour*. 2006; 143 (2): 141-158.

**URL:** <http://www.brill.nl>

**Descriptors:** bovine tuberculosis, badgers (*Meles meles*), cattle, *Mycobacterium bovis*, cattle behaviors, dairy cows, use of pastures, correlations with physiological states, disease transmission from pastures, badger excreta, milk levels, differences in cattle behavior with just badger urine alone, disease risks, UK.

Singh, J.P.N.; Rishendra Verma; Chaudhuri, P. **Random amplified polymorphic DNA (RAPD) analysis of *Mycobacterium bovis* strain in India.** *Indian Journal of Animal Sciences*. 2006; 76 (11): 873-877. ISSN: 0367-8318

**NAL Call Number:** 41.8 IN22

**Descriptors:** buffalo, cattle, deer, *Mycobacterium bovis* AN5, *M. bovis* BCG, 20 field isolates, strain typing, RAPD-PCR, polymorphic amplicons, genetic defects, hereditary defects, heterogeneity, India.

Smith, G.C. **Persistence of disease in territorial animals: insights from spatial models of Tb.** *New Zealand Journal of Ecology*. 2006; 30 (1): 35-41. ISSN: 0110-6465

**NAL Call Number:** QH540.N43

**Descriptors:** cattle, bovine tuberculosis, wildlife disease transmission, disease, modeling factors, chance, model artifacts, population (e.g. demographic, genetic) heterogeneity, environmental heterogeneity.

Soares-Magalhaes, R.; Smith, N.H.; Dale, J.; Gover, K.; Mitchell, A.; Mawdsley, J.; Stoker, N.G. **Investigating the cluster of *Mycobacterium bovis* spoligotype 13 strains in the southeast of England.** *Society for Veterinary Epidemiology and Preventive Medicine Proceedings of a Meeting Held at Exeter, UK, 29-31 March 2006*. 2006: 215-227. ISBN: 0948073748

**Descriptors:** cattle, badgers (*Meles meles*), high concentration of bovine tuberculosis, *Mycobacterium bovis* isolates, clonal relationships, spoligotype 13, cluster analysis, wildlife as disease reservoirs, East Sussex county England.

Thacker, Tyler C. ; Palmer, Mitchell V.; Waters, W Ray. **Correlation of cytokine gene expression with pathology in white-tailed deer (*Odocoileus virginianus*) infected with *Mycobacterium bovis*.** *Clinical and Vaccine Immunology*. 2006; 13(6): 640-647. ISSN: 1556-6811

**URL:** <http://cvi.asm.org/>

**NAL Call Number:** RB46.5

**Descriptors:** *Mycobacterium bovis*, infected white-tailed deer, wildlife disease reservoir, immune response, cytokine gene expression, compared infected and uninfected animals, peripheral blood leukocytes analysis, role of IFN-gamma, interleukin-12p40 JL-12p40, IL-4 mRNA, locations of lesions in infected animals, lung and associated lymph nodes, northeast Michigan.

Thoen, C.; LoBue, P.; Kantor, I. de. **The importance of *Mycobacterium bovis* as a zoonosis.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 339-345. ISSN: 0378-1135. Note: Paper presented at the 4th International

Conference on *Mycobacterium bovis*, held August 22-26, 2005, Dublin, Ireland.

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** *Mycobacterium bovis* and closely associated acid-fast bacilli cause disease in humans. Epidemiologic investigations reveal that the organism may be ingested or inhaled. Extra pulmonary lesions may occur associated to the consumption of infected milk, even though with the practice of boiling milk, and the growth of milk pasteurization plants all over the world, the digestive route of infection became less important. On the other hand, airborne infection continues to occur among meat industry and slaughterhouse workers, in regions where the infection is still prevalent in cattle. Evidence of person to person transmission is rare. Main causes of concern related to *M. bovis* in industrialized countries are: epizootics in domesticated and wild mammals and latent infection in immigrants. Although multi-drug-resistant (MDR) strains of *M. bovis* have been identified, case reports reveal that anti-tuberculosis drugs routinely used to treat *Mycobacterium tuberculosis*-infected patients are effective when properly administered.

**Descriptors:** cattle, food animals, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, zoonoses, humans, tuberculosis, disease transmission, lesions animal, health hazards, occupational health and safety, livestock and meat industry, slaughterhouses, disease outbreaks, wild animals, latent period, multiple drug resistance, asymptomatic infections.

Trcka, I.; Lamka, J.; Kopečna, M.; Beran, V.; Parmova, I.; Pavlik, I. **Mycobacteria in wild boar (*Sus scrofa*) in the Czech Republic.** *Veterinarski Arhiv*. 2006; 76(Supplement): S27-S32

**URL:** <http://www.vet.hr/vetarhiv>

**Descriptors:** wild boar (*Sus scrofa*), bovine tuberculosis, wildlife disease reservoir, wild and game parks, boars, sows, piglets, yearlings, tuberculous lesions, intestinal lymph nodes, *Mycobacterium avium* ssp. *avium*, *Mycobacterium avium*, *Mycobacterium chelonae*, *Mycobacterium fortuitum*, *Mycobacterium phlei*, *Mycobacterium scrofulaceum*, *Mycobacterium smegmatis*, *Mycobacterium terrae*, Central Europe, Croatia, Hungary, Slovakia.

Trcka, I.; Lamka, J.; Suchy, R.; Kopečna, M.; Beran, V.; Moravkova, M.; Horvathova, A.; Bartos, M.; Parmova, I.; Pavlik, I. **Mycobacterial infections in European wild boar (*Sus scrofa*) in the Czech Republic during the years 2002 to 2005.** *Veterinarni Medicina*. 2006; 51 (5): 320-332. ISSN: 0375-8427

**URL:** <http://vetmed.vri.cz>

**NAL Call Number:** 41.9 C333

**Descriptors:** 842 wild boar (*Sus scrofa*), wild pigs, hunting season screening, game parks, tissue sampling, fecal sampling, *Mycobacterium chelonae*, *Mycobacterium fortuitum*, *Mycobacterium phlei*, *Mycobacterium smegmatis*, *Mycobacterium terrae*, *Mycobacterium abscessus*, *Mycobacterium avium* ssp. *hominissuis*, *Mycobacterium scrofulaceum*, *Mycobacterium triviale*, Czech Republic.

UK Department for Environment Food and Rural Affairs. **Special Issue: Bovine TB.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 91 pp. ISSN: 0269-5545. Note: Special issue contains 10 articles on TB.

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle, other species, *Mycobacterium bovis*, TB disease levels and distribution, TB policies, disease modeling, Bovigam assay, antemortem diagnosis, tuberculin skin test, zoonotic infections, control programs, issues limiting eradication, EC, USA, Africa, Canada, New Zealand, EU.

Vengust, G; Zele, D. **Nekatere infekcijske bolezni pri jelenjadi v oborah s poudarkom na zoonozah. [Some infectious diseases of deer in enclosures with emphasis on zoonosis.]** *Veterinarske Novice*. 2006; 32 (3/4): 57-62. ISSN: 0351-5842. Note: In Slovenian with an English summary.

**Descriptors:** deer farming, fallow deer, red deer, venison, diseases of farmed deer, zoonotic diseases, *Bacillus anthracis*, *Brucella abortus*, Herpesviridae, *Leptospira*, *Listeria monocytogenes*, malignant catarrhal fever virus, *Mycobacterium avium* ssp. *paratuberculosis*, *Mycobacterium bovis*, *Salmonella*, *Yersinia pseudotuberculosis*, Slovenia.

Vicente, J.; Hofle, U.; Garrido, J.M.; Fernandez de Mera, I.G.; Juste, R.; Barral, M.; Gortazar, C. **Wild boar and red deer display high prevalences of tuberculosis-like lesions in Spain.** *Veterinary Research*. 2006; 37 (1): 107-119. ISSN: 0928-4249

**URL:** <http://www.vetres.org/>

**NAL Call Number:** SF602.A5

**Descriptors:** wild boar, red deer, lesions, prevalence, Spain.

Vidal, Dolores; Naranjo, Victoria; Mateo, Rafael; Gortazar,-Christian; de la Fuente, Jose. **Analysis of serum biochemical parameters in relation to *Mycobacterium bovis* infection of European wild boars (*Sus scrofa*) in Spain.** *European Journal of Wildlife Research*. 2006; 52 (4): 301-304. ISSN: 1612-4642

**URL:** <http://www.springerlink.com/content/110828/>

**Descriptors:** European wild boar (*Sus scrofa*), wild animals disease reservoir, *Mycobacterium bovis* pathogen, biomarkers for predicting TB, effective control programs, no real marker found, Spain.

Wahlstrom, H.; Englund, L. **Adopting control principles in a novel setting.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 265-271. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** The paper describes the introduction of *Mycobacterium bovis* into Swedish deer herds and its possible consequences. The different control strategies applied are summarized as well as their shortcomings under the conditions of the Swedish outbreak. An alternative control, to be used in extensive deer herds, based only on slaughter and meat inspection is described. Finally, the efficiency of the implemented control and surveillance systems are discussed and possible improvements suggested.

**Descriptors:** deer, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control, disease control programs, disease outbreaks, disease transmission, meat inspection, disease surveillance, slaughter, tuberculin, zoonoses, humans, tuberculosis, slaughterhouses, Sweden.

Ward, A.I.; Tolhurst, B.A.; Delahay, R.J. **Farm husbandry and the risks of disease transmission between wild and domestic mammals: a brief review focusing on bovine tuberculosis in badgers and cattle.** *Animal Science* (Penicuik). 2006; 82 (Part 6): 767-773. ISSN: 1357-7298.

**URL:** <http://journals.cambridge.org/action/displayJournal?jid=ASC>

**Descriptors:** wildlife as disease reservoirs, mammals, domesticated animals, disease transmission, European badgers (*Meles meles*), brushtail possums (*Trichosurus vulpecula*), culling strategies, changing livestock husbandry, farm management, *Mycobacterium bovis*, UK.

Waters, W.R.; Palmer, M.V.; Slaughter, R.E.; Jones, S.L.; Pitzer, J.E.; Minion, F.C. **Diagnostic implications of antigen-induced gamma interferon production by blood leukocytes from *Mycobacterium bovis*-infected reindeer (*Rangifer tarandus*).** *Clinical and Vaccine Immunology*. 2006; 13 (1): 37-44. ISSN: 1556-6811

**URL:** <http://cvi.asm.org/>

**Abstract:** The only approved method of tuberculosis (TB) surveillance of reindeer within the United States is tuberculin skin testing; however, skin testing has an apparent lack of specificity, since numerous reindeer are classified as reactors, yet *Mycobacterium bovis* is not isolated from tissues upon necropsy. The objective of this study was to evaluate the ability of an in vitro assay (the Cervigam assay) to detect gamma interferon (IFN- gamma ) produced by blood leukocytes in response to mycobacterial antigens from *M. bovis*-infected reindeer. Thirteen male reindeer ~9 months of age were inoculated with 10<sup>5</sup> CFU *M. bovis* in their tonsillar crypts. Stimulation of whole-blood cultures with a mitogen resulted in significant production of IFN-gamma compared to that by nonstimulated samples. Responses by infected reindeer to *M. bovis* purified protein derivative (PPD) were as much as 3.5-fold higher than those by noninfected reindeer (n=4). Despite differences in responses to PPD by the two groups, reindeer within the noninfected group had responses of >0.1 change in optical density ( Delta OD) (a level generally considered positive) to PPD. Mean responses by infected reindeer to a rESAT-6-CFP-10 fusion protein (*Mycobacterium tuberculosis* complex specific) were as much as 20-fold higher than respective responses by noninfected reindeer at all time points. Additionally, responses by 3/4 noninfected reindeer were <0.1 Delta OD (considered negative) at each time point. To further evaluate the specificity of the assay, samples were collected from reindeer in a TB-free herd. All reindeer had responses to mitogen; however, only 1 of 38 had a response to PPD, and none of the reindeer responded to rESAT-6-CFP-10. Together, these findings indicate that IFN-gamma-based tests may prove useful for TB surveillance of reindeer..

**Descriptors:** reindeer (*Rangifer tarandus*), experimental infection, TB surveillance, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, IFN-gamma-based tests, fusion protein.

Waters, W. Ray; Palmer, Mitchell V.; Thacker, Tyler C.; Minion, F Chris; Davis, William C. **Antigen-specific proliferation and activation of peripheral blood mononuclear cells from *Mycobacterium bovis*-infected reindeer.** *Veterinary Immunology and Immunopathology*. 2006; 111 (3-4): 263-277. ISSN: 0165-2427.  
**URL:** [http://www.elsevier.com/wps/find/journalabstracting.cws\\_home/503319/abstracting](http://www.elsevier.com/wps/find/journalabstracting.cws_home/503319/abstracting)  
**NAL Call Number:** SF757.2.V38

**Descriptors:** reindeer, *Mycobacterium bovis* infected animals, blood mononuclear cells, proliferation and activation-associated responses, experimental infection, host resistance to progressive disease, rESAT6:CFP10 stimulation, MHC II fluorescence intensity increased on CD4(+), gamma delta TCR+, CD172a(+), and IgM(+) cells from infected reindeer.

Woodroffe, R.; Donnelly, C.A.; Cox, D.R.; Bourne, F.J.; Cheeseman, C.L.; Delahay, R.J.; Gettinby, G.; McInerney, J.P.; Morrison, W.I. **Effects of culling on badger *Meles meles* spatial organization: implications for the control of bovine tuberculosis.** *Journal of Applied Ecology*. 2006; 43 (1): 1-10. ISSN: 0021-8901  
**URL:** <http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=jpe>  
**NAL Call Number:** 410.J828II

**Abstract:** The incidence of bovine tuberculosis (TB) in British cattle has risen markedly over the last two decades. Failure to control the disease in cattle has been linked to the persistence of a reservoir of infection in European badgers *Meles meles*, a nationally protected species. Although badger culling has formed a component of British TB control policy for many years, a recent large-scale randomized field experiment found that TB incidence in cattle was no lower in areas subject to localized badger culling than in nearby areas where no experimental culls occurred. Indeed, analyses indicated that cattle incidence was higher in culled areas. One hypothesis advanced to explain this pattern is that localized culling disrupted badgers' territorial behaviour, potentially increasing the rate of contact between cattle and infected badgers. This study evaluated this hypothesis by investigating badger activity and spatial organization in 13 study areas subjected to different levels of culling. Badger home ranges were mapped by feeding colour-marked baits at badger dens and measuring the geographical area in which colour-marked faeces were retrieved. Badger home ranges were consistently larger in culling areas. Moreover, in areas not subjected to culling, home range sizes increased with proximity to the culling area boundary. Patterns of overlap between home ranges were also influenced by culling. Synthesis and applications. This study demonstrates that culling badgers profoundly alters their spatial organization as well as their population density. These changes have the potential to influence contact rates between cattle and badgers, both where culls occur and on adjoining land. These results may help to explain why localized badger culling appears to have failed to control cattle TB, and should be taken into account in determining what role, if any, badger culling should play in future control strategies..

**Descriptors:** cattle, badgers (*Meles meles*), bovine tuberculosis, culling of wild badger, wild animal disease reservoirs, home ranges, increased contact between badgers and cattle, UK.

## 2005

Acevedo Whitehouse, K.; Vicente, J.; Gortazar, C.; Hofle, U.; Fernandez de Mera, I.G.; Amos, W. **Genetic resistance to bovine tuberculosis in the Iberian wild boar.** *Molecular Ecology*. 2005 Sept; 14 (10): 3209-3217. ISSN: 0962-1083  
**URL:** <http://www.blackwell-synergy.com/loi/mec>  
**NAL Call Number:** QH540.M64

**Descriptors:** wild boars, bovine tuberculosis, *Mycobacterium bovis*, disease resistance, genetic resistance, heterosis, heterozygosity, inbreeding, animal diseases, Spain.

Aldwell, F.E.; Keen, D.L.; Parlane, N.A.; Skinner, M.A.; Lisle, G.W. de; Buddle, B.M. **Oral vaccination with *Mycobacterium bovis* BCG in a lipid formulation induces resistance to pulmonary tuberculosis in brushtail possums.** *Cattle Practice*. 2005; 13 (4): 457-463. ISSN: 0969-1251. Note: Reprinted from *Vaccine*, 2003; 22: 70-60.  
**NAL Call Number:** SF961.C37

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain, brushtailed possums (*Trichosurus vulpecula*), disease vectors, BCG vaccine, oral vaccination, disease prevention and control, disease resistance, disease vectors, drug formulations, experimental infections, lymphocytes, immune response, immunity, lymphocytes, wild animals, New

Zealand.

Biet, Franck; Boschioli, Maria Laura; Thorel, Marie Francoise; Guilloteau, Laurence A. **Zoonotic aspects of *Mycobacterium bovis* and *Mycobacterium avium-intracellulare* complex (MAC).** *Veterinary Research* (Les Ulis). 2005; 36(3): 411-436. ISSN: 0928-4249.

**URL:** <http://www.edpsciences.org/journal/index.cfm?edpsname=vetres>

**NAL Call Number:** SF602.A5

**Descriptors:** *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium avium* ssp. *avium*, *Mycobacterium intracellulare* complex, epidemiology, zoonotic diseases, transmission between environment and wildlife, etiology, possibilities of control and management, Europe, North American New Zealand.

Bradley, Mark; Wilmshurst, John **The fall and rise of bison populations in Wood Buffalo National Park: 1971 to 2003.** *Canadian Journal of Zoology*. 2005; 83 (9): 1195-1205. ISSN: 0008-4301.

**NAL Call Number:** 470 C16D

**Descriptors:** bison decline, disease predation, *Mycobacterium bovis*, *Brucella abortus*, historical changes in bison population, temporal and spatial factors, census data, reproductive rates, stochastic population model, survival of juveniles, Peace-Athabasca Delta, Wood Buffalo, National Park, Canada.

Bourne, J.; Donnelly, C.A.; Cox, D.R.; Gettinby, G.; McInerney, J.P.; Morrison, I.; Woodroffe, R. **Bovine tuberculosis: towards a future control strategy.** *Cattle Practice*. 2005; 13 (4): 289-294. ISSN: 0969-1251. Note: Reprinted from *Veterinary Record*. 2003; 167: 207-210.

**NAL Call Number:** SF961.C37

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, pathogenesis, diagnosis, disease prevalence, disease control programs, disease prevention, wildlife as disease reservoirs, disease transmission, UK.

Bourne, J.; Donnelly, C.A.; Cox, D.R.; Gettinby, G.; McInerney, J.P.; Morrison, W.I.; Woodroffe, R. **Bovine tuberculosis - towards a science based control strategy.** *Cattle Practice*. 2005; 13 (4): 319-322. ISSN: 0969-1251. Note: Reprinted from *Science in Parliament*. 2005; 62: 25-28.

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, badgers (*Meles meles*), wild animal disease reservoir, transmission risks, *Mycobacterium bovis*, animal welfare, control programs; culling, diagnosis, disease control, disease prevalence and prevention, disease surveys, epidemiological surveys, epidemiology, molecular epidemiology, vaccination, vaccines.

Caley, Peter; Hone, Jim. **Assessing the host disease status of wildlife and the implications for disease control: *Mycobacterium bovis* infection in feral ferrets.** *Journal of Applied Ecology*. 2005; 42(4): 708-719. ISSN: 0021-8901

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0021-8901&site=1>

**NAL Call Number:** 410 J828

**Descriptors:** feral ferrets, *Mustela furo*, *Mycobacterium bovis*, host status of disease, wildlife as pathogen reservoir, wildlife management, field observations, field experiments, modeling, level of reservoir population related to *Mycobacterium bovis* levels, New Zealand.

Chambers, M.A.; Pressling, W.A.; Cheeseman, C.L.; Clifton-Hadley, R.S.; Hewinson, R.G. **Value of existing serological tests for identifying badgers that shed *Mycobacterium bovis*.** *Cattle Practice*. 2005; 13 (4): 333-336. ISSN: 0969-1251

**Descriptors:** wild badgers (*Meles meles*), wild animals as disease reservoirs, testing techniques, value of testing, cattle, *Mycobacterium bovis*, UK.

Chen, SanPing; Morley, R.S. **Observed herd size and animal association.** *Ecological Modelling*. 2005; 189 (3/4): 425-435. ISSN: 0304-3800

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503306/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503306/description#description)

**NAL Call Number:** QH541.15.M3E25

**Descriptors:** *Bison bison*, *Brucella abortus*, brucellosis, *Mycobacterium bovis*, tuberculosis in wild animals, risk

assessment, disease transmission, animal behavior, animal ecology, migration, movement, population density, seasonal variation, statistical analysis, wildlife management, free-ranging bison Wood Buffalo National Park, Alberta, north western Canada.

Cleaveland, S.; Mlengeya, T.; Kazwala, R.R.; Michel, A.; Kaare, M.T. Jones, S.L.; Eblate, E.; Shirima, G.M; Packer, C. **Tuberculosis in Tanzanian wildlife.** *Journal of Wildlife Diseases.* 2005; 41 (2): 446-453. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Descriptors:** *Mycobacterium bovis*, free ranging wildlife, 11.1% (2/ 18) migratory wildebeest (*Connochaetes taurinus*), 11.1% (1/9) topi (*Damaliscus lunatus*), lesser kudu (*Tragelaphus imberbis*), 4% Serengeti lions (*Panthera leo*), African buffalo (*Syncerus caffer*), Tanzania.

Clifton-Hadley, R.S.; Wilesmith, J.W. **Tuberculosis in deer: a review.** *Cattle Practice.* 2005; 13 (4): 369-379. ISSN: 0969-1251. Note: Reprinted from *Veterinary Record.* 1991; 129: 5-12.

**NAL Call Number:** SF961.C37

**Descriptors:** captive deer, deer farming, game animals, *Mycobacterium bovis*, clinical aspects, postmortem examination, diagnosis, histopathology, pathogenesis, therapy, disease control, control programs, disease prevalence, disease pathology, disease prevention, wild animal disease reservoirs, Denmark, New Zealand, UK.

Clifton-Hadley, R.S. **Tuberculosis vaccination: the long road to a better BCG.** *Cattle Practice.* 2005; 13 (4): 465-466. ISSN: 0969-1251. Note: Reprinted from the *Veterinary Journal.* 2003 166: 1-2. (2003)

**NAL Call Number:** SF961.C37

**Descriptors:** badgers, *Meles meles*, *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain, BCG vaccine, disease control programs, disease prevention; wild animals as disease reservoirs, disease vectors, vaccination, vaccine development, vaccines, immune response to vaccination.

Coburn, H.L.; Snary, E.L.; Kelly, L.A.; Wooldridge, M. **Qualitative risk assessment of the hazards and risks from wild game.** *Veterinary Record* (London). 2005; 157(11): 321-322. ISSN: 0042-4900.

**URL:** <http://veterinaryrecord.bvapublications.com/>

**NAL Call Number:** 41.8 V641

**Descriptors:** zoonotic disease hazards, risk assessment, bacterial diseases, game animal meat, birds, ducks, deer, larger animals, rabbits, food contamination, food hygiene, food safety, health hazards, human diseases, lead shot, meat animals, meat quality, risk factors, risk assessment, risk factors, *Campylobacter jejuni*, *Escherichia coli*, *Mycobacterium avium* complex, *Mycobacterium bovis*, *Salmonella*, *Chlamydophila psittaci*, hazard analysis and critical control point.

Coleman, J.; Fraser W. **Bovine Tb persistence in low-density possum populations - the patchiness problem.** *13<sup>th</sup> Australasian Vertebrate Pest Conference, Wellington, New Zealand, 2-6 May, 2005.* 2005: 81-86

**Descriptors:** control brushtail possum (*Trichosurus vulpecula*), density characteristics of possum populations, disease in patchy locations, persistence of disease in wild populations, cattle, New Zealand.

Collins, J.D. **The control of tuberculosis in cattle: an Irish view.** *Cattle Practice.* 2005; 13 (4): 361-367. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle, badgers (*Meles meles*), *Mycobacterium bovis*, Irish Republic.

Corner, L.A.L.; Norton, S.; Buddle, B.M.; Morris, R.S. **The efficacy of bacille Calmette-Guerin vaccine in wild brushtail possums (*Trichosurus vulpecula*).** *Cattle Practice.* 2005; 13 (4): 447-455. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium bovis* BCG strain, brushtail possums (*Trichosurus vulpecula*), New Zealand.

Corner, L.A.L.; Buddle, B.M. **Conjunctival vaccination of the brushtail possum (*Trichosurus vulpecula*) with bacille Calmette-Guerin.** *New Zealand Veterinary Journal.* 2005; 53 (2): 133-136. ISSN: 0048-0169

**URL:** <http://www.vetjournal.org.nz/nzvet.html>

**NAL Call Number:** 41.8 N483

**Descriptors:** *Mycobacterium bovis* BCG, *Trichosurus vulpecula*, BCG vaccine, eyes, conjunctival vaccination, drug delivery systems, immune response, challenge with virulent *Mycobacterium bovis*, efficacy of vaccination method, cell mediated immunity, immune response, lymphocyte transformation, post mortem organ sampling, lungs, spleen, tuberculosis, prevention by aerosolised vaccine to eyes and nose.

Cousins, D.V.; Florisson, N. **A review of tests available for use in the diagnosis of tuberculosis in non-bovine species.** *Revue Scientifique et Technique Office International des Epizooties*. 2005 December; 24 (3): 1039-1059. ISSN: 0253-1933. Note: In English with an English, French and Spanish summary.

**Descriptors:** bovine tuberculosis, negative social and economic impacts, affects domestic and wild animals, animal diversity, zoonotic diseases, intradermal tuberculin test, ELISA, prescribed test for diagnosis in cattle, *Mycobacterium bovis*, review of various tests used for diagnosis, validated diagnostics for different species, number of animals used for test validation.

Cox, D.R.; Donnelly, C.A.; Bourne, F.J.; Gettinby, G.; McInerney, J.P.; Morrison, W.I.; Woodroffe, R. **Simple model for tuberculosis in cattle and badgers.** *Proceedings of the National Academy of Sciences of the United States of America*. 2005; 102 (49): 17588-17593. ISSN: 0027-8424

**URL:** <http://www.pnas.org/>

**NAL Call Number:** 500 N21P

**Abstract:** As an aid to the study of bovine tuberculosis (TB), a simple model has been developed of an epidemic involving two species, cattle and badgers. Each species may infect the other. The proportion of animals affected is assumed relatively small so that the usual nonlinear aspects of epidemic theory are avoided. The model is used to study the long-run and transient effect on cattle of culling badgers and the effect of a period without routine testing for TB, such as occurred during the 2001 epidemic of foot-and-mouth disease in Great Britain. Finally, by examining the changes in cattle TB over the last 15 years, and with some other working assumptions, it is estimated that the net reproduction number of the epidemic is ~1.1. The implications for controlling the disease are discussed..

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, modeling disease transmission, effects of culling badgers, testing interruption, disease control, UK.

Delahay, R.J.; Cheeseman, C.L.; Mallinson, P.J.; Rogers, L.M.; Smith, G.C. **Badgers and bovine tuberculosis: a review of studies in the ecology of a wildlife disease reservoir.** *Cattle Practice*. 2005; 13(4): 295-299. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** wild badgers (*Meles meles*), cattle, wild animals as disease reservoirs, *Mycobacterium bovis*, UK.

Delahay, R.J.; Leeuw, A.N.S. de; Barlow, A.M.; Clifton-Hadley, R.S.; Cheeseman, C.L. **The status of *Mycobacterium bovis* infection in UK wild mammals: a review.** *Cattle Practice*. 2005; 13 (4): 427-440. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** wild animals, mammalian disease reservoirs, cats, foxes (*Vulpes vulpes*), pigs, rats (*Rattus norvegicus*), bats, voles *Apodemus*, badgers (*Meles meles*), goats, *Capreolus capreolus*, red deer (*Cervus elaphus*), *Cervus nippon*, deer, hedgehogs (*Erinaceus europaeus*), fallow deer; ferrets, hares (*Lepus europaeus*), equines, horses, otters (*Lutra lutra*), *Microtus*, mink (*Mustela erminea*), *Muntiacus reevesi*, mice, weasel (*Mustela nivalis*), *Mycobacterium bovis*, *Neomys*, rabbit (*Oryctolagus cuniculus*), squirrels (*Sciurus*), *Sorex* shrews, moles (*Talpa europaea*), UK.

Denis, Michel; Keen, Denise L.; Wedlock, D. Neil; de Lisle, Geoffrey W.; Buddle, Bryce M. **Susceptibility of brushtail possums (*Trichosurus vulpecula*) infected with *Mycobacterium bovis* is associated with a transient macrophage activation profile.** *Tuberculosis* (Amsterdam). 2005; 85 (4): 235-244. ISSN: 1472-9792

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/638428/description?navopenmenu=-2](http://www.elsevier.com/wps/find/journaldescription.cws_home/638428/description?navopenmenu=-2)

**Descriptors:** Australian brushtail possum (*Trichosurus vulpecula*), wildlife reservoir for pathogen, *Mycobacterium bovis* virulent strain, pathogenesis, disease process, experimental infection, aerosol exposure, lung lesions, livers, spleens, blood lymphocytes proliferated, nitric oxide levels in lungs, tumor necrosis factor alpha, transient activation of alveolar macrophages, New Zealand.

- Denis, Michel; Wedlock, D. Neil; Buddle, Bryce M.; **Vaccination of brushtail possums, *Trichosurus vulpecula*, with Bacille Calmette-Guerin induces T lymphocytes that reduce *Mycobacterium bovis* replication in alveolar macrophages via a contact-dependent/nitric oxide-independent mechanism.** *Immunology and Cell Biology*. 2005; 83 (1): 57-66. ISSN: 0818-9641  
**URL:** <http://www.blackwell-synergy.com/loi/icb>  
**NAL Call Number:** QR180.I43  
**Descriptors:** brushtail possums, *Trichosurus vulpecula*, *Mycobacterium bovis* BCG, *Mycobacterium bovis*, permissiveness of alveolar macrophages for pathogen replication, bacterial metabolism via 3H uracil, effects of the addition of lymphokines or recombinant-possum TNF-alpha enhanced permissiveness, nitric oxide release, comparison of effects between pathogen and BCG strains.
- Drake, John M. **Risk analysis for invasive species and emerging infectious diseases: Concepts and applications.** *American Midland Naturalist*. 2005; 153 (1): 4-19. ISSN: 0003-0031  
**URL:** <http://www.bioone.org/perlserv/?request=get-archive&issn=0003-0031>  
**Descriptors:** zoonotic diseases, emerging infectious diseases, modeling invasive species and epidemics as a stochastic process, more effective policies for risk assessment, dynamics of feral nutria (*Mycastor coypus*), *Mycobacterium bovis* in various species, Allee effect model, Ricker model, bovine epidemics possible with introductions into brushtailed possums (*Trichosurus vulpecula*) or badgers (*Meles meles*), culling as a control measure.
- Efford, M.; Norbury, G. **Ferret population assessment: progress and challenges.** In: *13<sup>th</sup> Australasian Vertebrate Pest Conference, Wellington, New-Zealand, 2-6 May 2005*. Published by Manaaki Whenua Press, Landcare Research. Lincoln, New Zealand. 2005: 75-80.  
**Descriptors:** cattle, ferrets, *Mycobacterium bovis*, wild animal disease reservoirs, disease vectors, bait traps; baiting, baits, capture of feral animals, control programs, dispersal of feral animals, invasions, population levels, methodology, pest control, pest management, population density, population dynamics, reservoir hosts, trapping, vertebrate pests, wild animals, New Zealand.
- Forrester, G.J.; Delahay, R.J.; Clifton-Hadley, R.S. **Screening badgers (*Meles meles*) for *Mycobacterium bovis* infection by using multiple applications of an ELISA.** *Cattle Practice*. 2005; 13 (4): 327-332. ISSN: 0969-1251  
**NAL Call Number:** SF961.C37  
**Descriptors:** badgers (*Meles meles*), screening badgers, *Mycobacterium bovis*, various applications, ELISA, UK.
- Gallagher, J.; Clifton-Hadley, R.S. **Tuberculosis in badgers; a review of the disease and its significance for other animals.** *Cattle Practice*. 2005; 13 (4): 401-417. ISSN: 0969-1251. ISSN: 0969-1251  
**NAL Call Number:** SF961.C37  
**Descriptors:** badgers (*Meles meles*) cattle, *Mycobacterium bovis*, Irish Republic; UK.
- Gallagher, J. **Tuberculosis: tracing the dilemma.** *Veterinary Times*. 2005; 35 (27): 14-17. ISSN: 1352-9374  
**Descriptors:** badgers (*Meles meles*) as pathogenic disease reservoirs, cattle, *Mycobacterium bovis*, epidemiology, disease prevalence and transmission, seasonal effects, disease control strategies, trapping, pathobiology, abscesses, various organs with lesions, latent infections, vaccines, bites, wounds, mortality rates, England.
- Garnett, B.T.; Delahay, R.J.; Roper, T.J. **Ranging behaviour of European badgers (*Meles meles*) in relation to bovine tuberculosis (*Mycobacterium bovis*) infection.** *Applied Animal Behaviour Science*. 2005; 94(3-4): 331-340. ISSN: 0168-1591  
**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503301/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503301/description#description)  
**NAL Call Number:** QL750.A6  
**Descriptors:** badgers (*Meles meles*), *Mycobacterium bovis*, infected and uninfected member of a pair, wild animals as disease reservoirs, comparison of ranging and foraging behaviors, radio telemetry tracking, direction observations, infected animals increased ranging behavior.
- Gerhold, R.W.; Fischer, J.R. **Avian tuberculosis in a wild turkey.** *Avian Diseases*. 2005 Mar; 49 (1): 164-166. ISSN: 0005-2086. Note: In English with a Spanish summary.  
**NAL Call Number:** 41.8 Av5

**Abstract:** A liver from a hunter-harvested wild turkey (*Meleagris gallopavo*) from Kansas was evaluated by the Southeastern Cooperative Wildlife Disease Study. Grossly, the liver contained several grayish-white masses ranging from 0.5-3 cm in diameter. These masses were scattered throughout the parenchyma and bulged from the capsular surface. Histologic examination revealed multifocal to coalescing granulomas with low numbers of acid-fast bacilli within multinucleated giant cells at the periphery of the granulomas. Culture of the liver yielded *Mycobacterium avium* subspecies *avium* and low numbers of *Staphylococcus intermedius*.

**Descriptors:** wild turkeys, *Meleagris gallopavo*, game birds, avian tuberculosis, bird diseases, case studies, liver, histopathology, *Mycobacterium avium* subsp. *avium*; animal pathogenic bacteria; *Staphylococcus-intermedius*, new host records; Kansas.

Godfroid, Jacques; Delcorps, Cathy; Ireng, Leonid M.; Walravens, Karl; Marche, Sylvie; Gala, Jean-Luc. **Definitive differentiation between single and mixed mycobacterial infections in red deer (*Cervus elaphus*) by a combination of duplex amplification of p34 and f57 sequences and Hpy188I enzymatic restriction of duplex amplicons.**

*Journal of Clinical Microbiology*. 2005 Sep; 43 (9): 4640-4648. ISSN: 0095-1137

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1489394>

**NAL Call Number:** QR46 .J6

**Abstract:** Severe emaciation and mortalities suggestive of mycobacterial infections were recently reported for both adult and young wild red deer (*Cervus elaphus*) in the southeastern part of Belgium. In deer, tuberculous lesions are not pathognomonic of *Mycobacterium bovis* infection due to gross and microscopic similarities with lesions caused by *Mycobacterium avium* subsp. *paratuberculosis* or *M. avium* subsp. *avium*. The aim of this study was to improve molecular methods for the species-specific identification of *M. bovis*, *M. avium* subsp. *avium*, and *M. avium* subsp. *paratuberculosis* in mycobacterial infections of deer. DNA banding patterns were assessed prior to and after Hpy188I restriction of f57-upstream (us)-p34 duplex amplicons. The duplex f57-us-p34 PCR differentiated *M. bovis* from *M. avium* subsp. *paratuberculosis* and *M. avium* subsp. *avium* infections, whereas the restriction step differentiated single *M. avium* subsp. *paratuberculosis* or *M. avium* subsp. *avium* infections from mixed *M. avium* subsp. *paratuberculosis*/*M. avium* subsp. *avium* infections. The endonuclease Hpy188I cleaves DNA between nucleotides N and G in the unique TCNGA sequence. This restriction site was found at position 168 upstream of the us-p34 initiation codon in all *M. avium* subsp. *avium* strains tested, regardless of their origin and the results of IS901 PCR. In contrast, the restriction site was abrogated in all *M. avium* subsp. *paratuberculosis* strains tested, independent of their origin, Mycobactin J dependency, and IS900 PCR results. Consequently, a two-step strategy, i.e., duplex us-p34-f57 PCR and Hpy188I restriction, allowed us to exclude *M. bovis* infection and to identify single (*M. avium* subsp. *paratuberculosis* or *M. avium* subsp. *avium*) or mixed (*M. avium* subsp. *paratuberculosis*/*M. avium* subsp. *avium*) infections in wild red deer in Belgium. Accordingly, we propose to integrate, in a functional molecular definition of *M. avium* subsp. *paratuberculosis*, the absence of the Hpy188I restriction site from the us-p34 amplicon.

**Descriptors:** red deer, *Cervus elaphus*, mixed mycobacterial infections, diagnosis, excluding some species, 2-step strategy, duplex us-p34-f57 PCR and Hpy188I restriction, Belgium.

Griffin, J.M.; Williams, D.H.; Kelly, G.E.; Clegg, T.A.; O'Boyle, I.; Collins, J.D.; More, S.J. **The impact of badger removal on the control of tuberculosis in cattle herds in Ireland.** *Preventive Veterinary Medicine*, 2004; 67: 237-266. ISSN: 0167-5877

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503315/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503315/description#description)

**NAL Call Number:** SF601.P7

**Abstract:** In Ireland, the herd prevalence of bovine tuberculosis has remained stable for several decades, and in common with several other countries, progress towards eradication has stalled. There is evidence in support of the potential role of infected badgers (*Meles meles*, a protected species) in bovine tuberculosis in Ireland and Britain. However, this evidence on its own has not been sufficient to prove disease causation. Field trials are likely to offer the best opportunity to define this role. Building on the earlier East Offaly project, our objectives were to assess the impact of badger removal on the control of tuberculosis in cattle herds in Ireland. The study was conducted from September 1997 to August 2002 in matched removal and reference areas (average area of 245.1km<sup>2</sup>) in four counties: Cork, Donegal, Kilkenny and Monaghan. Badger removal was intensive and proactive throughout the study period in the removal areas, but reactive (in response to severe tuberculosis outbreaks in cattle) in the reference areas. Removal intensity in the removal and reference areas during the first 2 years of the study averaged 0.57 and 0.07 badgers/km<sup>2</sup>/year, respectively. The outcome of interest was restriction of cattle herds due to confirmed tuberculosis, where tuberculous lesions were detected in one or more animals. Data were analysed using logistic regression

(modelling the probability of a confirmed herd restriction) and survival analysis (modelling time to a confirmed herd restriction). During the study period, there was a significant difference between the removal and reference areas in all four counties in both the probability of and the time to a confirmed herd restriction due to tuberculosis. In the final year of the study, the odds of a confirmed herd restriction in the removal (as compared to the reference areas) were 0.25 in Cork, 0.04 in Donegal, 0.26 in Kilkenny and 0.43 in Monaghan. Further, the hazard ratios (removal over reference) ranged from 0.4 to 0.04 (a 60-96% decrease in the rate at which herds were becoming the subject of a confirmed restriction).

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, diagnosis, disease prevention and control programs, disease-prevalence, wild life as disease reservoirs, epidemiology, regression analysis, trapping, vector control, wild animals, Irish Republic.

Griffin, J.M.; Clegg, T.A.; Kelly, G.E.; Williams, D.H.; O'Boyle, I.; Collins, J.D.; More, S.J. **The impact of badger removal on the control of tuberculosis in cattle herds in Ireland.** In: D.J. Mellor; A.M. Russell; J.L.N. Wood (Editors). *Society for Veterinary Epidemiology and Preventive Medicine Proceedings of a Meeting Held at Nairn, Inverness, Scotland, 30<sup>th</sup> March 1<sup>st</sup> April 2005*. Published by Society for Veterinary Epidemiology and Preventive Medicine. Roslin, UK. 2005; 42-54. ISBN: 0948073691

**Descriptors:** cattle, badgers (*Meles meles*), *Mycobacterium bovis*, disease control, disease vectors, risk assessment, survival, tuberculosis, Ireland.

Jahans, K.L.; Worth, D.; Brown, J.; Monies, R.J. **Detection of bovine tuberculosis in spill-over hosts.** *Research in Veterinary Science*. 2005; 78 (Suppl. A): 23-24. ISSN: 0034-5288. Note: Meeting abstract. 59th Annual Conference of the Association for Veterinary Teaching and Research Work, Scarborough, England; March 21 -23, 2005

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Descriptors:** *Mycobacterium bovis*, cattle, buffalo, bison, sheep, goats, dogs, deer, cats, badgers, pigs, domestic and wildlife species, spill over hosts, end hosts, animal pathogen reservoirs, maintenance hosts.

Ji, W.; White, P.C.L.; Clout, M.N. **Contact rates between possums revealed by proximity data loggers.** *Journal of Applied Ecology*. 2005 June; 42 (3): 595-604. ISSN: 0021-8901

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0021-8901&site=1>

**NAL Call Number:** 410 J828

**Descriptors:** *Trichosurus vulpecula*, opossums, *Mycobacterium bovis*, bovine tuberculosis, animal behavior, data collection, population density, wildlife habitats, mating systems, disease transmission, pest control, wildlife as disease reservoirs, New Zealand.

Jolles, Anna E.; Cooper, David V.; Levin, Simon A. **Hidden effects of chronic tuberculosis in African buffalo.** *Ecology* (Washington, DC). 2005 September; 86 (9): 2358-2364. ISSN: 0012-9658

**NAL Call Number:** 410 EC7

**Abstract:** Infectious diseases can bring about population declines and local host extinctions, contributing significantly to the global biodiversity crisis. Nonetheless, studies measuring population-level effects of pathogens in wild host populations are rare, and taxonomically biased toward avian hosts and macroparasitic infections. We investigated the effects of bovine tuberculosis (bTB), caused by the bacterial pathogen *Mycobacterium bovis*, on African buffalo (*Syncerus caffer*) at Hluhluwe-iMfolozi Park, South Africa. We tested 1180 buffalo for bTB infection between May 2000 and November 2001. Most infections were mild, confirming the chronic nature of the disease in buffalo. However, our data indicate that bTB affects both adult survival and fecundity. Using an age-structured population model, we demonstrate that the pathogen can reduce population growth rate drastically; yet its effects appear difficult to detect at the population level: bTB causes no conspicuous mass mortalities or fast population declines, nor does it alter host-population age structure significantly. Our models suggest that this syndrome-low detectability coupled with severe impacts on population growth rate and, therefore, resilience-may be characteristic of chronic diseases in large mammals.

**Descriptors:** African buffalo (*Syncerus caffer*), *Mycobacterium bovis*, disease impacts adult survival and fecundity, age structures model, no conspicuous mass mortalities, hidden population dynamics, chronic disease effects of chronic infections, Hluhluwe iMfolozi Park, South Africa.

Joly, Damien O.; Messier, Francois. **The effect of bovine tuberculosis and brucellosis on reproduction and survival of wood bison in Wood Buffalo National Park.** *Journal of Animal Ecology*. 2005; 74 (3): 543-551. ISSN: 0021-8790

**URL:** <http://www.blackwell-synergy.com/loi/jae>

**NAL Call Number:** 410 J826

**Descriptors:** wood bison, *Bison bison athabasca*, effects of pathogens, *Mycobacterium bovis*, *Brucella abortus*, field study, capture and release with radio transmitters, survival survey, some double infections, lower pregnancy probability and winter survival, not sufficient test for role of disease in population levels, Wood Buffalo National Park, Canada.

Kalema-Zikusoka, G.; Bengis, R.G.; Michel, A.L.; Woodford, M.H. **A preliminary investigation of tuberculosis and other diseases in African buffalo (*Syncerus caffer*) in Queen Elizabeth National Park, Uganda.** *Onderstepoort Journal of Veterinary Research*. 2005; 72 (2): 145-151. ISSN: 0030-2465

**URL:** [http://www.journals.co.za/ej/ejour\\_opvet.html](http://www.journals.co.za/ej/ejour_opvet.html)

**NAL Call Number:** 41.8 ON1

**Descriptors:** *Mycobacterium bovis*, disease survey, disease prevalence, African free range buffaloes, (*Syncerus caffer*), gamma interferon test, emaciated warthog (*Phacochoerus aethiopicus*), foot and mouth disease, brucellosis, Queen Elizabeth National Park, Uganda.

Lisle, G.W. de; Yates, G.F. Caley, P.; Corboy, R.J. **Surveillance of wildlife for *Mycobacterium bovis* infection using culture of pooled tissue samples from ferrets (*Mustela furo*).** 2005; 53 (1): 14-18. ISSN: 0048-0169

**URL:** <http://www.vetjournal.org.nz/nzvet.html>

**NAL Call Number:** 41.8 N483

**Descriptors:** ferrets (*Mustella furo*), *Mycobacterium bovis*; *Mycobacterium tuberculosis*, wildlife management, pooled lymph nodes, with and without macroscopic lesions, disease prevalence, surveillance cost benefit analysis, tissue culture, wildlife management, New Zealand.

Lutze-Wallace, C.; Berlie-Surujballi, G.; Barbeau, Y.; Bergeson, D. **Strain typing of *Mycobacterium bovis* from a 1978 case of tuberculosis in a wolf (*Canis lupis*) from Manitoba.** *Canadian Veterinary Journal = La Revue Veterinaire Canadienne*. 2005; 46 (6): 502. ISSN: 0008-5286. Note: Journal in French and English.

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=202>

**NAL Call Number:** 41.8 R3224

**Descriptors:** *Mycobacterium bovis*, wolf *Canis lupis*), wild animal infection, Manitoba.

Lutze Wallace, C.; Turcotte, C.; Sabourin, M.; Berlie-Surujballi, G.; Barbeau, Y.; Watchorn, D.; Bell, J. **Spoligotyping of *Mycobacterium bovis* isolates found in Manitoba.** *Canadian Journal of Veterinary Research = Revue Canadienne de Recherche Veterinaire*. 2005 Apr; 69 (2): 143-145. ISSN: 0830-9000. Note: In English with a French summary.

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=133>

**NAL Call Number:** SF601.C24

**Descriptors:** deer, cattle, elk, *Cervus elaphus Canadensis*, *Mycobacterium bovis*, microsatellite repeats, 44 isolates, tissue sources, hybridized with oligonucleotide 12 (MB-1 type), oligonucleotide 12 (MB-1 type), oligonucleotide 12 (MB-2 type), Manitoba, Canada.

Lutze-Wallace, C.; Turcotte, C. **Laboratory diagnosis of bovine tuberculosis in Canada for calendar year 2004.** *Canadian Veterinary Journal*. 2005; 46 7(9): 797-799. ISSN: 0008-5286. Note: In English and French.

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=202>

**NAL Call Number:** 41.8 R3224

**Descriptors:** wild animals, zoo animals, livestock, bison, cattle, *Cervus elaphus*, deer, elephants, equines, cats, bacterial disease, *Mycobacterium*, *Mycobacterium avium*, *Mycobacterium avium* ssp *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium fortuitum*, *Mycobacterium kansasii*, *Mycobacterium flavescens*, *Mycobacterium triviale*, *Mycobacterium terrae*, red deer, pigs, Suiformes, disease diagnosis, disease surveys, Alberta, British Columbia, Manitoba, Ontario, Quebec, Saskatchewan, Canada.

Machackova-Kopečna, M.; Bartos, M.; Straka, M.; Ludvik, V.; Svastova, P.; Alvarez, J.; Lamka, J.; Trcka, I.; Treml, F.; Parmova, I. **Paratuberculosis and avian tuberculosis infections in one red deer farm studied by IS900 and IS901**

**RFLP analysis.** *Veterinary Microbiology*. 2005 Feb 25; 105 (3-4): 261-268. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Descriptors:** *Cervus elaphus*, farmed game animals, red deer parks, animal diseases, avian tuberculosis, paratuberculosis, *Mycobacterium avium* subsp. *paratuberculosis*, *Mycobacterium avium*, case study, mixed infection, disease detection, disease diagnosis, histopathology, microbial detection, pathogen identification, RFLP, restriction fragment length polymorphism, epidemiology, disease outbreaks, Czech Republic.

Martin-Atance, P.; Palomares, F.; Gonzalez-Candela, M.; Revilla, E.; Cubero, M.J.; Calzada, J.; Leon-Vizcaino, L.

**Bovine tuberculosis in a free ranging red fox (*Vulpes vulpes*) from Donana National Park (Spain).** *Journal of Wildlife Diseases*. 2005; 41 (2): 435-436. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Descriptors:** carnivores survey, seven red foxes (*Vulpes vulpes*), two Egyptian mongoose (*Herpestes ichneumon*), one weasel (*Mustela nivalis*), two genets (*Genetta genetta*), one Iberian lynx (*Lynx pardinus*), one Eurasian badger (*Meles meles*), and two polecats (*Mustela putorius*), epidemiology of *Mycobacterium bovis* found in 1 red fox, Spain.

Maslow, J.N.; Mikota, S.K.; Zhu, M.; Riddle, H.; Peloquin, C.A. **Pharmacokinetics of ethambutol (EMB) in elephants.** *Journal of Veterinary Pharmacology and Therapeutics*. 2005; 28 (3): 321-323. ISSN: 0140-7783

**Descriptors:** African elephants, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, blood and lymphatics, ethambutol, antibacterial, isoniazid, pharmacokinetics, drug expulsion.

Mellor, D.J.; Russell, A.M.; Wood, J.L.N. (Editors). **Society for Veterinary Epidemiology and Preventive Medicine. Proceedings of a Meeting Held at Nairn, Inverness, Scotland, 30th March-1st April 2005.** Published by the Society. 2005. 277 pp. ISBN: 0948073691.

**Descriptors:** many papers, topics include animals diseases, epidemiology, disease prevalence, disease transmission and spread, disease control and prevention, diagnosis, reservoir hosts, public health aspects, bovine tuberculosis, *Mycobacterium bovis*, classical swine fever, rabies, pancreatic necrosis virus, foot and mouth disease, avian influenza A virus, *Streptococcus suis*, *Escherichia coli*, *Campylobacter*, *Salmonella* spp., *Ostertagia ostertagi*, broilers, domestic livestock, wild animal disease carriers, UK.

More, S.J. **Towards eradication of bovine tuberculosis in Ireland: a critical review of progress.** *Cattle Practice*. 2005; 13 (4): 313-318. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** cattle diseases, *Mycobacterium bovis*, tuberculosis control program, disease transmission from wildlife to cattle, wildlife disease reservoir, cattle to cattle transmission, epidemiology, development of a vaccine for badgers, *Meles meles*, eradication strategy, Irish Republic.

More, S.J. **Towards eradication of bovine tuberculosis in Ireland: a critical review of progress.** In: D.J. Mellor; A.M. Russell; J.L.N. Wood. (Editors). *Society for Veterinary Epidemiology and Preventive Medicine Proceedings of a Meeting Held at Nairn, Inverness, Scotland, 30<sup>th</sup> March-1<sup>st</sup> April, 2005.* Published by the Society. 2005; 13-23. ISBN: 0948073691

**Descriptors:** *Mycobacterium bovis*, bovine tuberculosis, eradication program, evidence of disease transmission badgers to cattle, wildlife reservoirs difficult to control, program for effective vaccine for badgers, Ireland.

Morgan, D.; Nugent, G.; Warburton, B. **Local elimination of possum populations - feasibility and benefits.** 13<sup>th</sup> *Australasian Vertebrate Pest Conference, Wellington, New Zealand 2-6-May 2005.* 2005: 160-167

**Descriptors:** *Mycobacterium bovis*, brushtail possums (*Trichosurus vulpecula*), wildlife as disease reservoirs, culling of possums, effects on cattle disease, density levels, feasibility of possum elimination, disease eradication, New Zealand.

Norton, S.; Corner, L.A.L.; Morris, R.S. **Ranging behaviour and duration of survival of wild brushtail possums (*Trichosurus vulpecula*) infected with *Mycobacterium bovis*.** *New Zealand Veterinary Journal*. 2005; 53 (5): 293-300. ISSN: 0048-0169.

**URL:** <http://www.vetjournal.org.nz/nzvet.html>

**NAL Call Number:** 41.8 N483

**Descriptors:** survival of possums, *Trichosurus vulpecula*, infected with *Mycobacterium bovis*, behavior important in disease transmission, field study, naturally infection, experimental infection, non-infected, comparison study, radio telemetry, denning behavior, total ranges, foray behavior, mortal infections, dead found in activity zones and scrub and pasture, consideration for control efforts, Castlepoint on the Wairarapa coast of the North Island in New Zealand

Olea-Popelka, F.J.; Flynn, O.; Costello, E.; McGrath, G.; Collins, J.D.; O'Keeffe, J.; Kelton, D.F.; Berke, O.; Martin, S.W. **Spatial relationship between trains in cattle and badgers in four areas in Ireland.** *Preventive Veterinary Medicine.* 2005; 71 (1-2): 57-70. ISSN: 0167-5877

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503315/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503315/description#description)

**NAL Call Number:** SF601.P7

**Descriptors:** *Mycobacterium bovis* strains, cattle, *Meles meles*, badgers setts, centroid of a cattle farm, logistic model, spatial clusters of strains, can be both in cattle and badgers, wild animals as reservoirs, dynamics of badger movements, epidemiology, transmission of bacteria from badgers to cattle, 4 areas of Ireland.

Olea-Popelka, F.J.; Phelan, J.; White, P.W.; McGrath, G.; Collins, J.D.; O'Keeffe, J.; Duggan, M.; Collins, D.M.; Kelton, D.F.; Berke, O.; More, S.J.; Martin, S.W. **Quantifying badger exposure and the risk of bovine tuberculosis for cattle herds in county Kilkenny, Ireland.** *Preventive Veterinary Medicine.* 2006; 75 (1/2): 34-46.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503315/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503315/description#description)

**NAL Call Number:** SF601.P7

**Descriptors:** *Meles meles*, quantifying badger exposure, cattle, bovine tuberculosis risk, Ireland.

Palmer, Mitchell V.; Waters, W. Ray; Thacker, Tyler C.; Stoffregen, William C.; Thomsen, Bruce V.; Slaughter, Ralph E.; Jones, Stephen L.; Pitzer, Josh E.; Minion, F. Chris. **Experimental infection of reindeer (*Rangifer tarandus*) with *Mycobacterium bovis*: pathological & immunological findings.** *Proceedings. Annual Meeting of the United States Animal Health Association.* 2005; 108: 113-116. ISSN: 0082-8750

**URL:** <http://www.usaha.org/Meetings.aspx>

**NAL Call Number:** 49.9 UN3R

**Descriptors:** reindeer (*Rangifer tarandus*), *Mycobacterium bovis*, bovine tuberculosis, experimental infection, disease pathology, disease process, immunological responses, diagnostic techniques.

Parra, A.; Larrasa, J.; Garcia, A.; Alonso, J.M.; Hermoso de Mendoza, J. **Molecular epidemiology of bovine tuberculosis in wild animals in Spain: A first approach to risk factor analysis.** *Veterinary Microbiology.* 2005 Oct. 31; 110 (3-4): 293-300. ISSN: 0378-1135

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** *Mycobacterium bovis*, animal pathogenic bacteria, risk factors, epidemiology, bovine tuberculosis, wild animals, ungulates, genetic markers, hosts, loci, symptoms, seasonal variation, disease prevalence, molecular epidemiology, reproductive season, hunting season, Spain.

Pollock, J.M.; Skuce, R.A.; Mackie, D.P.; Neill, S.D. **Bovine tuberculosis: research in Northern Ireland.** *Cattle Practice.* 2005; 13 (4): 301-303. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, Northern Ireland.

Ramsey, Dave; Efford, Murray; Ball, Steve; Nugent, Graham. **The evaluation of indices of animal abundance using spatial simulation of animal trapping .** *Wildlife Research.* 2005; 32 (3): 229-237. ISSN: 1035-3712

**Descriptors:** computer simulation of animal trapping, field studies, brushtail possums, population density, leg hold trap catches, accuracy of data, relative abundance, removal estimate near trip, trap-catch index, biases.

Segales, J.; Vicente, J.; Lujan, L.; Toussaint, M.J.M.; Gruys, E.; Gortazar, C. **Systemic AA-amyloidosis in a European wild boar (*Sus scrofa*) suffering from generalized tuberculosis.** *Journal of Veterinary Medicine Series A.* 2005; 52 (3): 135-137. ISSN: 0931-184X

**Descriptors:** European wild boar, *Sus scrofa*, adult female moribund animals, emaciated carcass, body with 25.9 kg,

parenchymatous organs, variable-sized granulomas, *Mycobacterium bovis* confirmed in mandibular lymph node, eosinophilic, liver, kidney, intestine, immunohistochemical results, first report of amyloidosis these animals, Cabaneros National Park, central Spain.

Skinner, M.A.; Keen, D.L.; Parlane, N.A.; Hamel, K.L.; Yates, G.F.; Buddle, B.M. **Improving protective efficacy of BCG vaccination for wildlife against bovine tuberculosis.** *Research in Veterinary Science*. 2005; 78 (3): 231-236. ISSN: 0034-5288

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Descriptors:** cattle, deer, brushtailed possums (*Trichosurus vulpecula*), wildlife vector, bovine tuberculosis, control, vaccination of possums with *Mycobacterium* BCG, effect of ranitidine on gastric acidity for oral administration of BCG, challenge with virulent *Mycobacterium bovis*, proliferative responses of blood lymphocytes to *M. bovis* antigens, procedure shows promise, New Zealand.

Spraker, T.R. **Diseases of free-ranging and captive North American cervids.** In: *Proceedings of the North American Veterinary Conference Large Animal Volume 19, Orlando, Florida, USA, 8-12 January, 2005*. Published by the Eastern States Veterinary Association. Gainesville. 2005; 326-330.

**Descriptors:** wild cervids, animals diseases, disease prevention and control, disease distribution, disease transmission, host ranges, diagnosis, clinical aspects, techniques, epidemiology, many organisms including *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium avium* ssp *paratuberculosis*, brucellosis, malignant catarrhal fever virus, etc.

Waters, W.R.; Palmer, M.V.; Bannantine, J.P.; Greenwald, R.; Esfandiari, J.; Andersen, P.; McNair, J.; Pollock, J.M.; Lyashchenko, K.P. **Antibody responses in reindeer (*Rangifer tarandus*) infected with *Mycobacterium bovis*.** *Clinical and Diagnostic Laboratory Immunology*. 2005; 12 (6): 727-735. ISSN: 1071-412X

**URL:** <http://cdli.asm.org/cgi/content/abstract/12/6/727>

**Descriptors:** reindeer (*Rangifer tarandus*), susceptible to *Mycobacterium bovis*, experimental infection and non-infected, ELISA, immunoblotting, multiantigen print immunoassay, antibody testing, seeking serological early testing.

Wedlock, D.N.; Aldwell, F.E.; Keen, D.; Skinner, M.A.; Buddle, B.M. **Oral vaccination of brushtail possums (*Trichosurus vulpecula*) with BCG: immune responses, persistence of BCG in lymphoid organs and excretion in faeces.** *New Zealand Veterinary Journal*. 2005; 53 (5): 301-306. ISSN: 0048-0169

**URL:** <http://www.vetjournal.org.nz/nzvet.html>

**NAL Call Number:** 41.8 N483

**Descriptors:** *Mycobacterium bovis* BCG strain, brushtailed possums (*Trichosurus vulpecula*), oral vaccination, immune response, development of strong cell mediated immunity, excretion, feces, persistence in gut associated lymphoid tissues, lung, spleen, liver, unlikely to result in undue environmental contamination.

Welz, Mirosław; Anusz, Krzysztof; Salwa, Andrzej; Zaleska, Magdalena; Bielecki, Wojciech; Osinska, Barbara; Kaczor, Stanisław; Kita, Jerzy. **Gruzlica bydleca u zubrow w Bieszczadach. [Bovine tuberculosis in European bison on the Bieszczady region.]** *Medycyna Weterynaryjna*. 2005; 61 (4): 441-444. ISSN: 0025-8628. Note: In Polish.

**Descriptors:** wild animals and domestic cattle, transfer of disease, wildlife as disease reservoirs, disease transmission, *Mycobacterium bovis*, European bison (*Bison bonasus caucasicus*), deer, winter feeding sites as places of transfer, Brzegi Dolne herd, Poland.

White, P.C.L.; Whiting, S.J. **Public attitudes towards badger culling to control bovine tuberculosis in cattle.** *Cattle Practice*. 2005; 13 (4): 419-426. ISSN: 0969-1251

**NAL Call Number:** SF961.C37

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, wild animal disease reservoirs, disease control strategies, culling of badgers, public opinions, UK.

Woodroffe, R.; Donnelly, C.A.; Johnston, W.T.; Bourne, F.J.; Cheeseman, C.L.; Clifton-Hadley, R.S.; Cox, D.R.; Gettinby, G.; Hewinson, R.G.; Le Fevre, A.M. **Spatial association of *Mycobacterium bovis* infection in cattle and**

**badgers *Meles meles*.** *Journal of Applied Ecology*. 2005 Oct 42 (5 ): 852-862. ISSN: 0021-8901

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0021-8901&site=1>

**NAL Call Number:** 410 J828

**Descriptors:** cattle, badgers, *Meles Meles*, *Mycobacterium bovis*, bovine tuberculosis, strains, zoonoses, spatial distribution, disease prevalence, disease reservoirs, disease transmission, disease control, cluster analysis, Great Britain.

Young, Jamie-S.; Gormley, Eamonn; Wellington, Elizabeth M. H. **Molecular detection of *Mycobacterium bovis* and *Mycobacterium bovis* BCG (Pasteur) in soil.** *Applied and Environmental Microbiology*. 2005; 71 (4): 1946-1952. ISSN: 0099-2240

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=83>

**NAL Call Number:** 448.3 Ap5

**Abstract:** PCR primers specific for the *Mycobacterium tuberculosis* complex were used to detect the presence of *Mycobacterium bovis* BCG (Pasteur) in soil microcosms and *Mycobacterium bovis* in environmental samples taken from a farm in Ireland with a history of bovine tuberculosis. *M. bovis* genes were detected in soil at 4 and 21 months after possible contamination. Gene levels were found in the range of  $1 \times 10^3$  to  $3.6 \times 10^3$  gene copies g of soil-1, depending on the sampling area. Areas around badger setts had the highest levels of detectable genes and were shown to have the highest levels of gene persistence. *M. bovis*-specific 16S rRNA sequences were detected, providing evidence of the presence of viable cells in Irish soils. Studies of DNA turnover in soil microcosms proved that dead cells of *M. bovis* BCG did not persist beyond 10 days. Further microcosm experiments revealed that *M. bovis* BCG survival was optimal at 37°C with moist soil (-20 kPa; 30% [vol/wt]). This study provides clear evidence that *M. bovis* can persist in the farm environment outside of its hosts and that climatic factors influence survival rates.

**Descriptors:** *Mycobacterium bovis*, environmental sampling of soils, PCR primers, areas of badger setts had highest levels of gene persistence, 10 day persistence, optimal conditions, Ireland.

## 2004

Aranaz, A.; Juan, L. de; Montero, N.; Sanchez, C.; Galka, M.; Delso, C.; Alvarez, J.; Romero, B.; Bezos, J.; Vela, A.I.; Briones, V.; Mateos, A.; Dominguez, L. **Bovine tuberculosis (*Mycobacterium bovis*) in wildlife in Spain.** *Journal of Clinical Microbiology*. 2004; 42(6): 2602-2608. ISSN: 0095-1137

**URL:** <http://jcm.asm.org/cgi/content/full/42/6/2602>

**Descriptors:** cattle, red deer (*Cervus elaphus*), fallow deer (*Dama dama*), hares (*Lepus europaeus*), lynx (*Lynx pardina*), pigs (*Sus scrofa*), *Mycobacterium bovis*, wild life, feral species, epidemiology, disease reservoirs, bacteriological culture, spacer oligonucleotide typing, various geographic locations, transmission and distribution of *M. bovis* strains. Spain.

Belgium Federal Agency for the Safety of the Food Chain. **Report on Zoonotic Agents in Belgium 2003: Working Group on Foodborne Infections and Intoxications.** Published by the Federal Agency for the Safety of the Food Chain (FASFC). Brussels. 2004; 74 pp.

**Descriptors:** common disease agents, domestic and wild animals, zoonotic potential, *Mycobacterium bovis*, *Brucella melitensis*, *Brucella abortus*, *Brucella suis*, *Salmonella* spp., *Trichinella* spp., rabies virus, *Campylobacter* spp., *Echinococcus granulosus*, *Echinococcus multilocularis*, *Listeria monocytogenes*, *Yersinia enterocolitica*, verotoxin producing *Escherichia coli* O157:H7, *Taenia saginata*, *Sarcocystis hominis*, *Sarcocystis suihominis*, *Toxoplasma gondii*, food borne illness, clinical aspects, routes of infection, recommendations, numbers of animals slaughtered in 2003, Belgium.

Bengis, R.G.; Kock, R.A.; Thomson, G.R.; Bigalke, R.D. **Infectious diseases of animals in sub-Saharan Africa: the wildlife/livestock interface.** In: J.A.W. Coetzer and R.C. Tustin (editors). *Infectious Diseases of Livestock, Volume One*. 2004; (Ed.2). Oxford University Press. Oxford. 2004: 225-238. ISBN: 01915761693. Note: A book chapter.

**Descriptors:** cattle, goats, pigs, horses, dogs, wildlife diseases, ruminants, *Syncerus caffer*, animal diseases, epidemics, African horse sickness; African swine fever, anthrax, brucellosis, epidemiology, foot and mouth disease, bovine tuberculosis, malignant catarrhal fever; rabies, Rift Valley fever, rinderpest, trypanosomiasis, etc.

Bengis, R.G.; Leighton, F.A.; Fischer, J.R.; Artois, M.; Morner, T.; Tate, C.M. **The role of wildlife in emerging and re-emerging zoonoses.** *Revue Scientifique et Technique Office International des Epizooties*. 2004; 23 (2): 497-511.

ISSN: 0253-1933. ISBN: 9290446218.

Note: Alternate title--**Emerging zoonoses and pathogens of public health concern.** In English with Spanish and French summaries.

**Descriptors:** zoonotic diseases, humans and animal diseases, wild animals, public and animal health concerns, reservoir disease hosts, *Mycobacterium bovis*, leptospirosis, Lyme disease, monkeypox, plague, rabies, Rift Valley fever, tuberculosis, tularaemia, West Nile, avian influenza virus, *Borrelia burgdorferi*, *Brucella*, Coronavirus, Ebola virus, *Ehrlichia chaffeensis*, *Ehrlichia phagocytophila*, *Francisella tularensis*, Hantavirus, HIV, SIV, *Leptospira interrogans*, Lyssavirus, Marburg virus, Paramyxovirus, Rift Valley fever virus, *Yersinia pestis*, *Ehrlichia ewingii*, ehrlichiosis, Hendra virus, Nipah virus, SARS coronavirus, severe acute respiratory syndrome, world wide.

Butchko, Peter H.; Schmitt, Stephen M. **Bovine tuberculosis in Michigan: the work on the wildlife side.**

*Proceedings of the Vertebrate Pest Conference.* 2004 October; 21: 202-205. ISSN: 0507-6773

**Descriptors:** *Mycobacterium bovis*, white tailed deer (*Odocoileus virginianus*), wild animals, transmission between domestic and wild animals, management of disease in wild herds, prevalence, Michigan.

Cross, P.C.; Lloyd-Smith, J.O.; Bowers, J.A.; Hay, C.T.; Hofmeyr, M.; Getz, W.M. **Integrating association data and disease dynamics in a social ungulate: bovine tuberculosis in African buffalo in the Kruger National Park.**

*Annales Zoologici Fennici.* 2004; 41 (6): 879-892. ISSN: 0003-455X

**URL:** <http://www.sekj.org/anz/anz416.htm#879>

**Descriptors:** *Mycobacterium bovis*, African buffalo, (*Syncerus caffer*), wild animal population, disease dynamics, radio tracking data, dynamic social network model, cluster analysis, seasonal/climate effects, disease transmission, epidemiology, Kruger National Park, South Africa.

Green, P. **Tuberculosis in wild deer on Exmoor.** *Deer. Journal of the British Deer Society.* 2004; 13(3): 14-17.

ISSN: 0141-4259

**Descriptors:** red deer (*Cervus elaphus*), wild game animals, *Mycobacterium bovis*, diagnosis, disease prevalence, epidemiology, animal pathology, clinical aspects; culling of sick animals, diagnosis legislation, postmortem examinations, animal welfare, UK.

Hars, J.; Boue, F.; Boireau, P.; Garin-Bastuji, B.; Potier, M.F. le; Mesplede, A.; Rossi, S.; Saint Andrieux, C.; Toma, B.

**Impact sanitaire de l'augmentation des effectifs de sangliers sauvages (*Sus scrofa*) en France. [Sanitation impacts due to the increase of wild-boar (*Sus scrofa*) populations in France.]** *Game and Wildlife Science.* 2004; 21 (4): 513-528. ISSN: 1622-7662. Note: In: P. Chardonnet; F. Lamarque; M. Birkan (editors). *Wildlife: A Natural Resource. Proceedings of the 6th International Wildlife Ranching Symposium, 6-9 July 2004, Paris, France.* In French with an English summary.

**Descriptors:** red deer, wild boar (*Sus scrofa*), game animals, disease reservoir, *Mycobacterium bovis*, *Brucella suis*, viral diseases, pigs, *Trichinella*, disease prevalence, serological disease surveys, disease transmission, disease vectors, epidemiology, mortality, parasitoses, population density, population distribution, reservoir hosts, Ministry of Agriculture, Food, Fish and Rural Affairs and the National Hunting and Wildlife Agency, France.

Joly, Damien O.; Messier, Francois. **Testing hypotheses of bison population decline (1970-1999) in Wood Buffalo National Park: synergism between exotic disease and predation.** *Canadian Journal of Zoology.* 2004; 82 (7):

1165-1176. ISSN: 0008-4301

**NAL Call Number:** 470 C16D

**Descriptors:** bison populations, population declines, disease predation hypothesis, *Mycobacterium bovis*, *Brucella abortus*, historical data, stochastic population simulation, disease possibly leading to predation by wolves, Wood Buffalo National Park from 1970 to 1999, Canada.

Joly, D.O.; Messier, F. **Factors affecting apparent prevalence of tuberculosis and brucellosis in wood bison.**

*Journal of Animal Ecology.* 2004; 73 (4): 623-631. ISSN: 0021-8790

**URL:** <http://www.blackwellpublishing.com/journal.asp?ref=0021-8790&site=1>

**NAL Call Number:** 410 J826

**Descriptors:** wood bison (*Bison bison*), live capture study, disease effects on wild populations, 49% positive for *Mycobacterium bovis*, 30.9% positive for *Brucella abortus*, bacterial diseases introduced in 1920s, reduced

reproduction and survival, caudal fold test and/or fluorescent polarization assay, serotesting for brucellosis by complement fixation of titre of gtoreq1 : 10, disease prevalence, pathogens endemic in the Park, age, gender, density, Wood Buffalo National Park, Canada.

Larson, Jean A, Animal Welfare Information Center (U.S.). **Tuberculosis in animals : *Mycobacterium* bacilli that cause devastating zoonotic diseases in many animals.** *AWIC Resource Series; no. 2004-01.* U.S. Dept. of Agriculture, Agricultural Research Service, National Agricultural Library, Animal Welfare Information Center. Beltsville, MD [2004]

**URL:** <http://www.nal.usda.gov/awic/pubs/TB/TBMain.htm>

**NAL Call Number:** aHV4701.A94 no. 2004-01

**Abstract:** The focus of this publication is on information related to tubercular diseases of animals caused by the bacterial genus *Mycobacterium*. Livestock diseases are mostly caused by *Mycobacterium bovis* and the *Mycobacterium tuberculosis* complex. Many species of animals are included: large ruminants, wildlife, wild animals as disease reservoirs, deer, elephants, birds, fish, etc. Topics are varied and include clinical aspects of the disease, the disease process, disease prevention and control, vaccines, immunology, bacterial genetics, zoonotic aspects, etc.

Diseases: tuberculosis in animals, bibliography, *Mycobacterium* sp, *Mycobacterium avium*, *Mycobacterium bovis*, zoonoses, production animals, zoo animals, wild animals, disease control, *Mycobacterium tuberculosis* complex, microbial genetics, disease incidence worldwide, control programs worldwide, immune response, wild animal vectors, treatments, animal disease models, aquatic animals, diagnostic methods, disease pathology, disease incidence worldwide.

Lutze-Wallace, C.; Chen, S.; Turcotte, C. **Laboratory diagnosis of bovine tuberculosis in Canada for calendar year 2003.** *Canadian Veterinary Journal.* 2004; 45(11): 915-916. ISSN: 0008-5286

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=202>

**NAL Call Number:** 41.8 R3224

**Descriptors:** cattle, bison, pigs, diagnosis, disease prevalence, disease surveys, epidemiological surveys, epidemiology, laboratory diagnosis, tuberculosis, wild animals, zoo animals *Mycobacterium-avium* subsp *avium*; *Mycobacterium flavescens*; *Mycobacterium gordonae*; *Mycobacterium triviale*, *Cervus elaphus Canadensis*, red deer, fallow deer, *Mycobacterium avium*, *Mycobacterium avium* subsp *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium chelonae*, *Mycobacterium fortuitum*, *Mycobacterium marinum*, *Mycobacterium terrae*, *Mycobacterium xenopi*, *Odocoileus virginianus*, pigs, Canada.

Mackintosh, C.G.; Lisle, G.W. de; Collins, D.M.; Griffin, J.F.T. **Mycobacterial diseases of deer.** *New Zealand Veterinary Journal.* 2004; 52 (4): 163-174. ISSN: 0048-0169

**URL:** <http://www.vetjournal.org.nz/nzvet.html>

**NAL Call Number:** 41.8 N483

**Descriptors:** captive farmed deer, *Mycobacterium avium* complex, *Mycobacterium avium* subsp *paratuberculosis*, *Mycobacterium bovis*, diagnosis, disease prevention and control, epidemiology, mycobacteria diseases, zoonotic diseases, paratuberculosis, literature reviews, New Zealand.

O'Brien, D.J.; Schmitt, S.M.; Berry, D.E.; Fitzgerald, S.D.; Vanneste, J.R.; Lyon, T.J.; Magsig, D.; Fierke J.S.; Cooley, T.M.; Zwick, L.S. **Estimating the true prevalence of *Mycobacterium bovis* in hunter-harvested white-tailed deer in Michigan.** *Journal of Wildlife Diseases.* 2004; 40 (1): 42-52. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Descriptors:** white-tailed deer, *Mycobacterium bovis* levels, disease prevalence studies, hunter harvested animals, Michigan.

O'Brien, Daniel J.; Yereb, Daniel J.; Cosgrove, Melinda K.; Carlson, Elaine S.; Schmitt, Stephen M.; Wilkins, Melinda J. **From the field: An occupational safety program for wildlife professionals involved with bovine tuberculosis surveillance.** *Wildlife Society Bulletin.* 2004; 32 (3): 992-999. ISSN: 0091-7648

**Descriptors:** bovine tuberculosis, *Mycobacterium bovis*, white-tailed deer (*Odocoileus virginianus*), free ranging wildlife, risks for Michigan Department Natural Resources staff and volunteers, occupational safety program, disease

surveillance activities, training document following National Institute for Occupational Safety and Health conducted field evaluation and validation, Michigan, USA.

Palmer, M.V.; Waters, W.R.; Whipple, D.L.; Slaughter, R.E.; Jones, S.L. **Evaluation of an in vitro blood-based assay to detect production of interferon- gamma by *Mycobacterium bovis*-infected white-tailed deer (*Odocoileus virginianus*).** *Journal of Veterinary Diagnostic Investigation*.

2004; 16 (1): 17-21. ISSN: 1040-6387

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** deer (*Odocoileus virginianus*), *Mycobacterium bovis*, captive Cervidae added to the USDA Uniform Methods and Rules for eradication of bovine tuberculosis, wild animals as a disease reservoir, testing potential of a new blood-based assay for Cervidae, animal welfare, reduced handling, stress and injury and death, experimental inoculation, 300 colony forming units. tonsillar crypts, young males and females, serial blood collection up to 307 days, analyzed for production of *M. bovis*, PPD<sub>b</sub>, *M. avium* PPD<sub>a</sub>, pokeweed mitogen or media alone, PPD<sub>b</sub> may serve diagnostic technique ante mortem, Michigan.

Palmer, M.V.; Waters, W.R.; Whipple, D.L. **Investigation of the transmission of *Mycobacterium bovis* from deer to cattle through indirect contact.** *American Journal of Veterinary Research*. 2004; 65 (11): 1483-1489. ISSN: 0002-9645

**URL:** <http://avmajournals.avma.org/loi/ajvr?cookieSet=1>

**NAL Call Number:** 41.8 Am3A

**Descriptors:** calves, deer, *Odocoileus virginianus*, disease transmission, *Mycobacterium bovis*, bovine tuberculosis, dietary exposure, animal diseases, feed contamination, wildlife livestock relations, wildlife food-habits, infection via oral exposure, transmission of infected white-tailed deer to uninfected cattle, indirect contact, experimental infection study, pen exchanges or uneaten feed from deer pens, Clinical Relevance Results show calves were infected via sharing feed with infected deer.

Palmer, Mitchell V.; Waters, W. Ray; Whipple, Diana L. **Shared feed as a means of deer-to-deer transmission of *Mycobacterium bovis*.** *Journal of Wildlife Diseases*. 2004; 40 (1): 87-91. ISSN 0090-3558.

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Descriptors:** white-tailed deer (*Odocoileus virginianus*), experimentally inoculated, *Mycobacterium bovis*, disease transmission to uninfected deer, indirect transmission of pathogen via sharing of feed, recommend not feeding of wild deer where cattle are infected, disease control.

Palmer, Mitchell V.; Waters, W. Ray; Whipple, Diana L. **Shared feed as a means of deer-to-deer transmission of *Mycobacterium bovis*.** *Journal of Wildlife Diseases*. 2004 January; 40(1): 87-91. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Descriptors:** captive, white-tailed deer, (*Odocoileus virginianus*), disease transmission, sharing feed, feeding behavior, experimental infection, *Mycobacterium bovis*, intra-tonsil inoculation of 4X10<sup>5</sup> colony-forming units to some animals, naïve deer offered food not consumed by infected deer, recommend not feed deer where disease is endemic.

Parra, A.; Larrasa, J.; Garcia, A.; Alonso, J.M.; Hermoso de Mendoza, J. **Molecular epidemiology of bovine tuberculosis in wild animals in Spain: a first approach to risk factor analysis.** *Veterinary Microbiology*. 2005; 110(3/4): 293-300. ISSN: 0378-1135

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** bovine tuberculosis; wild animals, *Mycobacterium bovis* strains; 59 from deer (*Cervus elaphus*); 112 from wild boar (*Sus scrofa*); 6 from bovines; 28 from wild pigs; 2 from goats; integration of epidemiological data into molecular classification data; wild ungulates; association of strains in clades; spoligotyping+VNTR typing, loci VNTR 2165, VNTR 2461, VNTR 0577, VNTR 0580, VNTR 3192 VNTR 2163a, and VNTR 2163b; 131 strains, 28 clusters, 76 unique profiles, Spain.

Scantlebury, M.; Hutchings, M.R.; Allcroft, D.J.; Harris, S. **Risk of disease from wildlife reservoirs: badgers, cattle, and bovine tuberculosis.** *Journal of Dairy Science.* 2004; 87 (2): 330-339. ISSN: 0022-0302

**URL:** <http://jds.fass.org/contents-by-date.0.shtml>

**NAL Call Number:** 44.8 J822

**Descriptors:** dairy cows, disease reservoirs, wildlife livestock relations, badgers, *Meles meles*, *Mycobacterium bovis*, cattle grazing intensity, rotational grazing, strip grazing, animal behavior, risk assessment, England.

Shury, Todd; Bergeson, Doug; Lutze-Wallice, Cyril; Surujballi, Om; Cattet, Marc. **Management of bovine tuberculosis in Riding Mountain National Park, Canada.** In: Baer, Charlotte Kirk (editor) *Proceedings: American Association of Zoo Veterinarians, American Association of Wildlife Veterinarians, Wildlife Disease Association: Health and Conservation of Captive and Free-Ranging Wildlife. Joint Conference, San Diego, California. August 28-September 3, 2004.* Published by the American Association of Zoo Veterinarians. 2004: 404-408. Note: Conference paper.

**Descriptors:** elk (*Cervus elaphus manitobensis*), deer (*Odocoileus virginianus*), *Mycobacterium bovis*, disease prevention and control, Riding Mountain National Park, Canada.

Waters, W.R.; Palmer, M.V.; Whipple, D.L.; Slaughter, R.E.; Jones, S.L. **Immune responses of white-tailed deer (*Odocoileus virginianus*) to *Mycobacterium bovis* BCG vaccination.** *Journal of Wildlife Diseases.* 2004; 40 (1): 66-78. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL Call Number:** 41.9 W64B

**Abstract:** The objective was to evaluate cellular immune response of captive white-tailed deer (*Odocoileus virginianus*) to live *Mycobacterium bovis* bacille Calmette Guérin (BCG) vaccination and to determine diagnostic implications of these responses. In vitro proliferative and interferon-gamma (IFN-gamma) responses to *M. bovis* purified protein derivative (PPD) were detected beginning 9 days postvaccination. Responses to *Mycobacterium avium* PPD, however, generally exceeded responses to *M. bovis* PPD. Interferon-gamma responses to *M. avium* PPD were not detected prior to vaccination nor in nonvaccinated deer, suggesting that vaccination with BCG boosted prior quiescent *M. avium*-sensitized cells. Both CD4+ and gamma delta T cells from vaccinated deer proliferated in response to *M. bovis* PPD stimulation. Intradermal administration of *M. bovis* PPD resulted in increases in skin thickness of vaccinated deer beginning 24 hr postinjection. Such early reactions were characterized by edema and minimal mononuclear cell infiltration, whereas later reactions (i.e., 72 hr postinjection) were more typical of delayed type hypersensitivity. Upon in vitro activation with pokeweed mitogen, CD44 expression increased and CD62L expression decreased on lymphocytes from deer regardless of vaccination status. Likewise, *M. bovis* PPD stimulation of lymphocytes from vaccinated deer resulted in increases in CD44 expression and decreases in CD62L expression. These findings demonstrate the potential of BCG vaccination to elicit strong cell-mediated immune responses and appropriate alterations in CD44 and CD62L expression with in vitro stimulation of white-tailed deer lymphocytes. In relation to *M. bovis* diagnosis, vaccination of white-tailed deer with BCG can induce skin test responses that classify the animal as a tuberculosis reactor. In contrast, BCG vaccination will likely not interfere with tuberculosis testing by the IFN-gamma assay.

**Descriptors:** captive white-tailed deer (*Odocoileus virginianus*), cellular immune response, vaccination, live *Mycobacterium bovis*, BCG, CD44, CD62L expression, in vitro stimulation of lymphocytes, skin test, IFN-gamma assay.

Waters, W.R.; Palmer, M.V.; Bannantine, J.P.; Whipple, D.L.; Greenwald, R.; Esfandiari, J.; Andersen, P.; McNair, J.; Pollock, J.M.; Lyashchenko, K.P. **Antigen recognition by serum antibodies in white-tailed deer (*Odocoileus virginianus*) experimentally infected with *Mycobacterium bovis*.** *Clinical and Diagnostic Laboratory Immunology.* 2004; 11(5): 849-855. ISSN: 1071-412X

**Descriptors:** White tailed deer (*Odocoileus virginianus*), wildlife reservoirs, *Mycobacterium bovis*, sera testing, evaluated by ELISA, immunoblotting, and multiantigen print immunoassay (MAPIA), immunoglobulin specific to *M. bovis* antigens, experimental infections via intratonsillar inoculation, aerosol, exposure to infected deer, bands of reactivity at approx 24 to 26 kDa, approx 33 kDa, approx 42 kDa, and approx 75 kDa to *M. bovis* whole-cell sonicate detected, responses boosted by tuberculin injection for intradermal tuberculin skin testing, immunodominant protein was MPB83, a sensitive serodiagnosis test requires multiple antigens, northern America.

Adams, S.J.R. **Badgers and bovine TB: bio-indicator or source?** *Veterinary Times*. 2003, 33 (9) 8-10. ISSN: 1352-9374

**Descriptors:** badgers, cattle, deer, *Mycobacterium bovis*, disease transmission patterns, disease vectors, sentinel animals, vector potential, tuberculosis, reviews.

Aldwell, F.E.; Keen, D.L.; Parlane, N.A.; Skinner, M.A.; Lisle, G.W. de; Buddle, B.M. **Oral vaccination with *Mycobacterium bovis* BCG in a lipid formulation induces resistance to pulmonary tuberculosis in brushtail possums.** *Vaccine*. 2003; 22 (1): 70-76. ISSN: 0264-410X

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/30521/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/30521/description#description)

**Descriptors:** cattle diseases, brushtail possums (*Trichosurus vulpecula*), *Mycobacterium bovis* BCG, oral vaccine against tuberculosis, lipid-based formulations, 2X10<sup>8</sup> colony forming units, lymphocyte proliferation responses to bovine purified protein derivative (PPD), peripheral blood lymphocytes, aerosol challenge with virulent *Mycobacterium bovis*, animal models, disease resistance, drug formulations, immune response, immunization, New Zealand.

Caron, Alex; Cross, Paul C.; Du Toit, Johan T. **Ecological implications of bovine tuberculosis in African buffalo herds.** *Ecological Applications*. 2003; 13 (5): 1338-1345. ISSN: 1051-0761

**Descriptors:** African buffalo, bovine tuberculosis, affect on various parameters, calf:cow ratio, age structure, body condition, endoparasite load, comparisons between low, high and zero prevalence, vulnerability to drought, impact on lion health status, diseased prey, northern, central, southern regions, Kruger National Park, South Africa.

Collins, Desmond M.; Kawakami, R Pamela; Buddle, Bryce M.; Wards, Barry J.; De Lisle, Geoffrey W. **Different susceptibility of two animal species infected with isogenic mutants of *Mycobacterium bovis* identifies *phoT* as having roles in tuberculosis virulence and phosphate transport.** *Microbiology* (Reading). 2003; 149 (11): 3203-3212. ISSN: 1350-0872

**URL:** <http://mic.sgmjournals.org/contents-by-date.0.shtml>

**NAL Call Number:** QR1.J65

**Descriptors:** *Mycobacterium tuberculosis* complex, *Mycobacterium bovis*, ATCC35721, mutation, principal sigma factor gene, sigA, accessory transcription factor WhiB3, *M. bovis*, Wag320, guinea pigs, brushtail possum (*Trichosurus vulpecula*), virulence restoring factor, *phoT*, role in phosphate uptake at low phosphate concentrations, 2 point deletions, use of different animal species.

Cooke, M.M.; Alley, M.R.; Manktelow, B.W. **Experimental infection with BCG as a model of tuberculosis in the brushtail possum (*Trichosurus vulpecula*).** *New Zealand Veterinary Journal*. 2003 June; 51(3) 132-138 ISSN: 0048-0169

**NAL call number:** 41.8 N483

**Descriptors:** *Trichosurus vulpecula*, brushtail possum, bacterial disease, *Mycobacterium bovis*, infection modeling using experimental infection with BCG, development and progression of lesions, intra-dermal inoculations, percutaneous and respiratory, natural infection.

Corner, L.A.L.; Stevenson, M.A.; Collins, D.M.; Morris, R.S. **The re-emergence of *Mycobacterium bovis* infection in brushtail possums (*Trichosurus vulpecula*) after localised possum eradication.** *New Zealand Veterinary Journal*. 2003, 51 (2) 73-80.

**NAL call number:** 41.8 N483

**Descriptors:** cattle, brushtail possums, *Mycobacterium bovis*, infection patterns, wild animal disease vectors and reservoirs, epidemiology, pest control, spatial distribution patterns, tuberculosis, vector potential, New Zealand.

Corner, L.A.L.; Norton, S. **Resolution of *Mycobacterium bovis* infection in wild brushtail possums (*Trichosurus vulpecula*).** *New Zealand Veterinary Journal*. 2003, 51 (1) 40-42.

**NAL call number:** 41.8 N483

**Descriptors:** *Mycobacterium bovis*; *Trichosurus vulpecula*, case reports, clinical aspects, disease control, tuberculosis, wild animals, New Zealand.

Delahay, R.J.; Wilson, G.; Rogers, L.M.; Cheeseman, C.L. **Bovine tuberculosis in badgers: can culling control the**

**disease?** *Linnean Society Occasional Publication*. 2003; 4: 165-171

**Descriptors:** badgers (*Meles meles*), *Mycobacterium bovis*, wild animal disease reservoir, culling as a control measures, disease prevention and control strategy, success of control measures, UK.

Diegel, K.L.; Fitzgerald, S.D.; Palmer, M.V.; Whipple, D.L. **A novel cytologic evaluation technique for the detection of mycobacteria in veterinary samples.** *Journal of Applied Research in Veterinary Medicine*. 2003, 1 (1) 37-44. ISSN: 1542-2666.

**NAL call number:** SF601.J63

**Descriptors:** *Mycobacterium bovis*, white-tailed deer, *Odocoileus virginianus*, cytology-based procedure, acid-fast bacteria, antemortem diagnostic techniques, tuberculosis, standard culture method, experimental infection, sensitivity and reliability of diagnostic tests, confirming infection.

Fitzgerald, Scott D.; Zwick, Laura S.; Diegel, Kelly L.; Berry, Dale E.; Church, Steven V.; Sikarskie, James G.; Kaneene, John B.; Reed, Willie M. **Experimental aerosol inoculation of *Mycobacterium bovis* in North American opossums (*Didelphis virginiana*).** *Journal of Wildlife Diseases*. 2003 April; 39 (2) 418-423 ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org/>

**NAL call number:** 41.9 W64B

**Descriptors:** North American opossums, *Didelphis virginiana*, *Mycobacterium bovis*, controlled experiment, aerosol inoculation, two dose levels, disease pathogenesis, fecal shedding, possible role as disease reservoir, disease transmission.

Frantz, A.C.; Pope, L.C.; Carpenter, P.J.; Roper, T.J.; Wilson, G.J.; Delahay, R.J.; Burke, T. **Reliable microsatellite genotyping of the Eurasian badger (*Meles meles*) using faecal DNA.** *Molecular Ecology*. 2003 June; 12 (6) 1649-1661. ISSN: 0962-1083

**NAL call number:** QH540.M64

**Descriptors:** Eurasian badgers, *Meles meles*, microsatellite genotyping, population genetics techniques, population estimations, estimates based on fecal DNA based microsatellite genotyping data, molecular genetics, methodologies, wildlife reservoir for *Mycobacterium*, England.

Gallaher, E.; Kelly, L.; Pfeiffer, D.U.; Wooldridge, M. **A quantitative risk assessment for badger to cattle transmission of *Mycobacterium bovis*.** *Proceedings of a meeting Society for Veterinary-Epidemiology and Preventive Medicine*. [Great Britain]. 2003: 33-44. ISSN: 0956-7496. Note: Meeting held March 31-April 2, 2003, Warwick, England.

**NAL Call Number:** SF780.9.S63

**Descriptors:** cattle, badgers, *Mycobacterium bovis*, bovine tuberculosis, disease transmission, risk assessment, mathematical models.

Garnett, B.T.; Roper, T.J.; Delahay, R.J. **Use of cattle troughs by badgers (*Meles meles*). A potential route for the transmission of bovine tuberculosis (*Mycobacterium bovis*) to cattle.** *Applied Animal Behavior Science*. 2003. 80 (1): 1-8. ISSN: 0168-1591

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503301/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503301/description#description)

**NAL Call Number:** QL750.A6

**Descriptors:** badgers *Meles meles*, wild animals, cattle diseases, *Mycobacterium bovis*, cattle feed troughs height, wild animals, cattle-diseases, disease transmission, feces, vertebrate-pests, wildlife-livestock interactions, wildlife food habits, bovine tuberculosis, United Kingdom.

Glawischnig, W.; Allerberger, F.; Messner C.; Schonbauer, M.; Proding, W.M. **Tuberkulose-Endemie bei freilebendem Rotwild (*Cervus elaphus hippelaphus*) in den nordlichen Kalkalpen. [Tuberculosis in free-living red deer (*Cervus elaphus hippelaphus*) in the northern Alps.]** *Wiener Tierärztliche Monatsschrift*. 2003, 90 (2) 38-44. Note: In German with an English summary.

**NAL call number:** 41.8 T345

**Descriptors:** *Cervus elaphus*, deer, *Mycobacterium bovis*, tuberculosis, diagnosis, disease surveys, epidemiological surveys, epidemiology, histopathology, postmortem examinations, zoonoses, Austria.

Gormley, E.; Costello, E. **Tuberculosis and badgers: new approaches to diagnosis and control.** *Society for Applied*

*Microbiology Symposium Series*. 2003, No.32, 80S-86S.

**NAL call number:** QR1.S64 no. 32

**Descriptors:** Eurasian badger, *Meles meles*, wild animal disease reservoir, cattle, *Mycobacterium bovis* infection, disease control eradication programs, diagnosis of disease in badgers, profiles of disease episodes, possible vaccination, Ireland, Great Britain.

Jacques, C.N.; Jenks, J.A.; Jenny, A.L.; Griffin, S.L. **Prevalence of chronic wasting disease and bovine tuberculosis in free-ranging deer and elk in South Dakota.** *Journal of Wildlife Diseases*. 2003, 39 (1) 29-34.

**NAL call number:** 41.8 N483

**Descriptors:** elk, deer, *Cervus elaphus*, *Odocoileus virginianus*, *Odocoileus hemionus*, disease prevalence, disease surveys, chronic wasting disease, emaciation, spongiform encephalopathy, *Mycobacterium*, tuberculosis, prion diseases, hunter harvested sampling, South Dakota.

Luna, Janaina O.; Santos, Manoel A.A.; Durigon, Edison L.; Araujo, Joao P. Jr.; Duarte, Jose M.D. **Tuberculosis survey of free-ranging marsh deer (*Blastocerus dichotomus*) in Brazil .** *Journal of Zoo and Wildlife Medicine*. 2003; 34 (4): 414-415. ISSN: 1042-7260

**Descriptors:** free ranging marsh deer (*Blastocerus dichotomus*), assayed for tuberculosis, necropsy and histopathology, *Mycobacterium tuberculosis* complex (*M. tuberculosis*, *Mycobacterium bovis*, *Mycobacterium microti*, *Mycobacterium africanum*), esophageal-pharyngeal fluids, DNA extraction, amplified by PCR, specific primers, agarose gel electrophoresis with ethidium bromide, all samples negative, deer not shedding, probably negative for the disease, Mato Grosso do Sul, Brazil.

Miller, R.A.; Kaneene, J.B.; Fitzgerald, S.D.; Schmitt, S.M. **Evaluation of the influence of supplemental feeding of white-tailed deer (*Odocoileus virginianus*) on the prevalence of bovine tuberculosis in the Michigan wild deer population.** *Journal of Wildlife Diseases*. 2003, 39 (1) 84-95.

**NAL call number:** 41.8 N483

**Descriptors:** free ranging deer, *Odocoileus virginianus*, supplemental feeding, disease transmission, bovine TB, *Mycobacterium*, risk factors, multivariable Poisson regression modeling approach, control measures, banning supplemental feeding.

Olea-Popelka, F.J.; Griffin, J.M.; Collins, J.D.; McGrath, G.; Martin, S.W. **Bovine tuberculosis in badgers in four areas in Ireland: does tuberculosis cluster?** *Preventive Veterinary Medicine*. 2003, 59 (1-2) 103-111. ISSN: 0167-5877

**NAL call number:** SF601.P7

**Descriptors:** badgers, *Meles meles*, cattle, *Mycobacterium bovis*, disease prevalence and distribution, epidemiology, reservoir hosts, tuberculosis, wild animal distribution, badger setts, Republic of Ireland.

Palmer, M.V.; Waters, W.R.; Whipple, D.L.; Slaughter, R.E.; Jones, S.L. **Analysis of interferon-C production by *Mycobacterium bovis* infected white-tailed deer (*Odocoileus virginianus*), using an in-vitro based assay.** *Journal of Veterinary Diagnostic Investigation*. Note: In Press.

**Descriptors:** TB, deer, immune response, interferon-C production, assay, *Mycobacterium bovis*, *Odocoileus virginianus*.

Palmer, M.V.; Waters, W.R.; Whipple, D.L. **Aerosol exposure of white-tailed deer (*Odocoileus virginianus*) to *Mycobacterium bovis*.** *Journal of Wildlife Diseases*. 2003; 39 (4): 817-823. ISSN: 0090-3558

**URL:** <http://www.jwildlifedis.org>

**NAL call number:** 41.9 W64B

**Abstract:** Tuberculosis due to *Mycobacterium bovis* affects both captive and free-ranging Cervidae in the United States. Various animal models have been developed to study tuberculosis of both humans and animals. Generally, tuberculosis is transmitted by aerosol and oral routes. Models of aerosol exposure of large animals to *M. bovis* are uncommon. In order to develop a reliable method of aerosol exposure of white-tailed deer (*Odocoileus virginianus*) to *M. bovis*, 12 healthy white-tailed deer, aged 8-10 mo, were infected by aerosol exposure to 2x10<sup>5</sup> to 1x10<sup>6</sup> colony forming units (CFU) (high dose, n=4) of *M. bovis* or 6x10<sup>2</sup> to 1.6x10<sup>3</sup> CFU (low dose, n=8) of *M. bovis*. Tuberculous lesions were more widely disseminated in deer receiving the high dose, while lesions in deer receiving the low dose were more focused on the lungs and associated lymph nodes (tracheobronchial and mediastinal). Aerosol delivery of *M.*

bovis to white-tailed deer results in a reliable manner of experimental infection that may be useful for studies of disease pathogenesis, immune response, mycobacterial shedding, and vaccine efficacy.. Add Descriptors: *Mycobacterium bovis*, white-tailed deer (*Odocoileus virginianus*), animal models, experimental infection via aerosol exposure, granulomas, clinical picture, lesions on various organs, immune response, pathogenesis, tuberculosis, vaccination.

Popluhar, L.; Hyzova, A. **Tuberkuloza zvierat ako zoonoza aj ako antropozoonoza. [Tuberculosis of animals as zoonosis as well as anthropozoonosis.]** *Slovensky Veterinarsky Casopis*. 2003; 28 (6): 38-39. ISSN: 1335-0099. Note: In Slovakian with an English summary.

**Descriptors:** elimination of animal tuberculosis, *Mycobacterium bovis*; *Mycobacterium bovis* BCG strain, BCG vaccine, vaccination, diagnosis, disease prevention and control, disease prevalence, zoonoses, Czechoslovakia.

Ramsey, D.; Cowan, P. **Mortality rate and movements of brushtail possums with clinical tuberculosis (*Mycobacterium bovis* infection).** *New Zealand Veterinary Journal*. 2003 August; 51(4) 179-185 ISSN: 0048-0169  
**NAL call number:** 41.8 N483

**Descriptors:** brushtail possums, *Trichosurus vulpecula*, mortality rates affected by disease, movements, diseased animals, trapping, live capture, radio collars, New Zealand.

Roper, T.J.; Garnett, B.T.; Delahay, R.J. **Visits to farm buildings and cattle troughs by badgers (*Meles meles*): a potential route for transmission of bovine tuberculosis (*Mycobacterium bovis*) between badgers and cattle.** *Cattle Practice*. 2003, 11 (1) 9-12. ISSN: 0969-1251

**NAL call number:** SF961.C37

**Descriptors:** cattle, farms, tracking wild badgers, *Meles meles*, nighttime visits to farms, climate, *Mycobacterium bovis*, cats, foxes, disease transmission, feces, feed trough contamination, rain, urine, disease control.

Waters, W.R.; Palmer, M.V.; Olsen, S.C.; Sacco, R.E.; Whipple, D.L. **Immune responses of elk to *Mycobacterium bovis* bacillus Calmette Guerin vaccination.** *Vaccine*. 2003, 21: 13-14, ISSN: 0264-410X.

**NAL call number:** QR189.V32

**Descriptors:** elk, *Cervus elaphus*, *Mycobacterium bovis*, B lymphocytes, bacterial antigens, BCG vaccine, blood serum, delayed type hypersensitivity, IgG, immune response, live vaccine immunization, lymphocyte transformation, wild animals, peripheral blood mononuclear cells, serum collections.

Zhu, Ping; She, FeiFei; Griffin, F. **Analysis of IFN- gamma and IL-4 mRNA expression in red deer infected with *Mycobacterium bovis* by real-time PCR.** *Chinese Journal of Zoonoses*. 2003; 19 (6): 49-51, 20. ISSN: 1002-2694. Note: In Chinese with an English summary.

**Descriptors:** red deer, *Cervus elaphus*, *Mycobacterium bovis* BCG vaccine, experimental infection, immune response, interferon, cytokines, immune response; immunization, interleukin-4, messenger RNA, Fujian, China.

## 2002

Bengis, R.G.; Kock, R.A.; Fischer, J. **Infectious animal diseases: the wildlife/livestock interface.** *Revue Scientifique et Technique Office International des Epizooties*. 2002. 21 (1) 53-65. Note: In English with Spanish and French summaries.

**NAL call number:** SF781 R4

**Descriptors:** analytical methods, animal diseases, brucellosis, *Brucella*, diagnosis, diagnostic techniques, disease control, ecotourism, livestock, rinderpest, tuberculosis, wildlife conservation.

Blanchong, J.A.; Scribner, K.T.; Winterstein, S.R. **Assignment of individuals to populations: Bayesian methods and multi-locus genotypes.** *Journal of Wildlife Management*. Apr 2002. 66 (2) 321-329. ISSN: 0022-541X

**NAL call number:** 410 J827

**Descriptors:** *Odocoileus virginianus*, Bayesian theory, multi-locus genotype data, loci, microsatellites, tuberculosis, wildlife management, deer, maximum likelihood, Michigan.

Bollo, E.; Ferroglio, E. **La tubercolosi negli animali selvatici. [Tuberculosis in wild animals, a review.]** *Obiettivi e Documenti Veterinari*. 2002. 23 (5) 57-67. Note: In Italian.

**Descriptors:** reviews, tuberculosis, wild animals, disease reservoirs.

Buddle, B.M.; Skinner, M.A.; Wedlock, D.N.; Collins, D.M.; de Lisle, G.W.; Fossum, C. (ed.); Watrang, E. **New generation vaccines and delivery systems for control of bovine tuberculosis in cattle and wildlife.** *Veterinary Immunology and Immunopathology*. 2002. 87 (3-4) 177-185. ISSN: 0165-2427. Note: 6th International Veterinary Immunology Symposium, Ultuna Campus, Swedish University of Agricultural Sciences, Uppsala, Sweden, July 2001.  
**NAL call number:** SF757.2.V38

**Descriptors:** vaccines, *Mycobacterium bovis*, cattle, wildlife.

Byrom, A.E. **Dispersal and survival of juvenile feral ferrets *Mustela furo* in New Zealand.** *Journal of Applied Ecology*. 2002. 39 (1) 67-78.

**NAL call number:** 410 J828

**Descriptors:** dispersal, pest population density and control, seasonal effects, sex effects, ferret survival, effect on tuberculosis spread, New Zealand.

Canfield, P.J.; Day, M.J.; Gavier-Widen, D.; Hewinson, R.G.; Chambers, M.A. **Immunohistochemical characterization of tuberculous and non-tuberculous lesions in naturally infected European badgers (*Meles meles*).** *Journal of Comparative Pathology*. May 2002. 126 (4) 254-264. ISSN: 0021-9975

**NAL call number:** 41.8 J82

**Descriptors:** *Meles meles*, European badgers, natural infection, tuberculosis, *Mycobacterium bovis*, granuloma, immunohistochemistry, antibodies, cross reaction, immunopathology, lymphocytes, phagocytes, immunological markers, immune serum, immune response.

Cavanagh, R.; Begon, M.; Bennett, M.; Ergon, T.; Graham, I.M.; de Haas, P.E.W.; Hart, C.A.; Koedam, M.; Kremer, K.; Lambin, X.; Roholl, P.; van Soelingen, D. ***Mycobacterium microti* infection (vole tuberculosis) in wild rodent population.** *Journal of Clinical Microbiology*. 2002. 40 (9) 3281-3285.

**NAL call number:** QR46.J6

**Descriptors:** disease prevalence, genetic correlation, genetic diversity, molecular genetics, skin lesions, tuberculosis, field surveillance, disease incidence, wild animals, *Mycobacterium microti*, voles, England, UK.

Chambers, M.A.; Pressling, W.A.; Cheeseman, C.L.; Clifton-Hadley, R.S.; Hewinson, R.G. **Value of existing serological tests for identifying badgers that shed *Mycobacterium bovis*.** *Veterinary Microbiology*. 2002. 86 (3) 183-189. ISSN: 0378-1135

**NAL call number:** SF601.V44

**Abstract:** In the UK there has been a sharp rise in the incidence of bovine tuberculosis since the early 1990s and the badger has been identified as an important wildlife reservoir for this infection. Infected badgers can excrete *Mycobacterium bovis*, putting other badgers and cattle at risk of becoming infected. Vaccination has been proposed as an approach to reducing the excretion of *M. bovis* by tuberculous badgers. In order to evaluate the efficacy of a badger vaccine it will be necessary to accurately determine the number of badgers excreting *M. bovis* without removing them for postmortem evaluation. The existing live tests for tuberculosis in the badger (culture, indirect ELISA, Western blot) have not been assessed for their ability to detect badgers excreting *M. bovis*. Over the past 18 years, badgers from 31 social groups have been trapped and sampled in a study area of the Cotswold escarpment. We have examined the serological responses of 128 badgers trapped between 1985 and 1998 from social groups where *M. bovis* infection was endemic. These responses were compared with culture from faeces, urine, tracheal aspirates and bite wound swabs taken from these animals while alive. ELISA was found to be more sensitive than Western blot in detecting badgers excreting *M. bovis*. The majority of culture-positive badgers excreted *M. bovis* intermittently over the period of study. As a result, there was only a 27.5% chance of sampling a badger for culture when it was excreting *M. bovis*. In contrast, a positive ELISA result correctly predicted 68.2% of badgers with a history of excreting *M. bovis*. In the absence of alternative live tests for the badger, the Brock Test indirect ELISA appears to be more valuable than culture for measuring the effect of vaccination on reducing the number of badgers at risk of transmitting tuberculosis.

**Descriptors:** disease transmission, badgers as a disease reservoir, ELISA, immunoblotting, immunology, serology, cattle, *Mycobacterium bovis*, *Mycobacterium tuberculosis*.

Cooper, J.E. **Diagnostic pathology of selected diseases in wildlife.** *Revue Scientifique et Technique Office International des Epizooties*. 2002. 21 (1) 77-89. Note: In English with Spanish and French summaries.

**NAL call number:** SF781 R4

**Descriptors:** analytical methods, diagnostic techniques, encephalitis, infectious diseases, pathology, tuberculosis,

rabies, Rift Valley fever, spongiform encephalopathy, wildlife, West Nile virus, poxviruses, *Mycobacterium*.

Corner, L.A.L.; Norton, S.; Buddle, B.M.; Morris, R.S. **The efficacy of bacille Calmette-Guerin vaccine in wild brushtail possums (*Trichosurus vulpecula*).** *Research in Veterinary Science*. 2002. 73 (2) 145-152.

**NAL call number:** 41.8 R312

**Descriptors:** BCG vaccine, *Mycobacterium*, disease prevention, immunization, vaccine potency, tuberculosis, vaccination, efficacy, wild animals, *Trichosurus vulpecula*, brushtail possums, New Zealand.

Corner, L.A.L.; Pfeiffer, D.U.; de Lisle, G.W.; Morris, R.S.; Buddle, B.M. **Natural transmission of *Mycobacterium bovis* infection in captive brushtail possums (*Trichosurus vulpecula*).** *New Zealand Veterinary Journal*. 2002. 50 (4) 154-162.

**NAL call number:** 41.8 N483

**Descriptors:** animal behavior, disease transmission, brushtail possums, *Trichosurus vulpecula*, experimental infection, immunization, social interaction, tuberculosis, vaccination, *Mycobacterium bovis*.

Corner, L.A.L.; Buddle, B.M.; Pfeiffer, D.U.; Morris, R.S. **Vaccination of the brushtail possum (*Trichosurus vulpecula*) against *Mycobacterium bovis* infection with bacille Calmette-Guerin: the response to multiple doses.** *Veterinary Microbiology*. Feb 4, 2002. 84 (4) 327-336. ISSN: 0378-1135

**NAL call number:** SF601.V44

**Abstract:** In New Zealand, the brushtail possum (*Trichosurus vulpecula*) is the principal wildlife vector of bovine tuberculosis. Control of infected possum populations contributes to the control of tuberculosis in domestic livestock. Vaccination is potentially a complementary strategy to population control, but to be cost-effective, administration of the vaccine to possums would need to be from an appropriately designed automatic vaccinator. Possums themselves would activate the vaccinator so that it would deliver an aerosol spray of vaccine. There would be no direct way to prevent possums receiving multiple doses of vaccine. This study examined the effect on protective immunity of repeated vaccination. Captive possums were vaccinated with BCG strain pasteur 1173P2 either 12 times at weekly intervals, twice at 6-weekly intervals, or once. Vaccination was by a combination of intranasal aerosol and conjunctival instillation. Eight weeks after the last dose of vaccine, all possums were challenged intratracheally with *Mycobacterium bovis* strain 83/6235. Vaccination induced a significant immune response as measured by the lymphocyte proliferation assay (LPA). A significant level of protection, as measured by the response to challenge, developed in all the vaccinated possum groups, but protection was greatest in the group vaccinated 12 times. It was concluded that protection would be enhanced if vaccinations were repeated at short intervals (weekly), but no benefit or detriment resulted from revaccination after longer intervals (1-2 months).

**Descriptors:** brushtail possums, *Trichosurus vulpecula*, *Mycobacterium bovis*, vaccination, infection, dosage, disease vectors, infections, population control, automation, equipment, aerosols, aerosol sprayers, immunity, experimental infections, lymphocytes, New Zealand.

de Lisle, G.W.; Bengis, R.G.; Schmitt, S.M.; O'Brien, D.J. **Tuberculosis in free-ranging wildlife: detection, diagnosis and management.** *Revue Scientifique et Technique Office International des Epizooties*. 2002. 21 (2) 317-334. In English with Spanish and French summaries.

**NAL call number:** SF781 R4

**Descriptors:** cell mediated immunity, diagnosis, serology, tuberculosis, wildlife, *Mycobacterium bovis*.

Delahay, R.J.; de Leeuw, A.N.S.; Barlow, A.M.; Clifton-Hadley, R.S.; Cheeseman, C.L. **The status of *Mycobacterium bovis* infection in UK wild mammals: a review.** *Veterinary Journal*. 2002. 164 (2) 90-105. ISSN: 1090-0233.

**NAL call number:** SF601.V484

**Descriptors:** disease prevalence, incidence, reservoir hosts, reviews, tuberculosis, wild animals, *Mycobacterium bovis*, UK.

Diegel, K.L.; Fitzgerald, S.D.; Berry, D.E.; Church, S.V.; Reed, W.M.; Sikarskie, J.G.; Kaneene, J.B. **Experimental inoculation of North American opossums (*Didelphis virginiana*) with *Mycobacterium bovis*.** *Journal of Wildlife Diseases*. Apr 2002. 38 (2) 275-281. ISSN: 0090-3558

**NAL call number:** 41.9 W64B

**Descriptors:** tuberculosis, disease transmission, experimental infection, oral administration, intramuscular injection, susceptibility, *Mycobacterium bovis*, American opossums, *Didelphis virginiana*, Michigan.

Frolich, K.; Thiede, S.; Kozikowski, T.; Jakob, W. **A review of mutual transmission of important infectious diseases between livestock and wildlife in Europe.** In: E.P.J. Gibbs and B.H. Bokma, B.H. (editors). *The Domestic Animal/Wildlife Interface: Issues for Disease Control, Conservation, Sustainable Food Production, and Emerging Diseases Conference and Workshop Organised by the Society for Tropical Veterinary Medicine and the Wildlife Diseases Association Wildlife and Livestock, Disease and Sustainability: What Makes Sense? Pilanesberg National Park, South Africa, 22-27 July, -2001. Annals of New York Academy of Sciences Vol. 969* 2002; 4-13. ISBN: 1573314382

**Descriptors:** wild red foxes, oral vaccination against rabies, zoonotic disease such as hog cholera in wild boar and domestic pigs, cattle and roe deer get BVD, myxomatosis and rabbit hemorrhagic disease in rabbits, *Mycobacterium bovis* in cattle, wild boars, badgers, deer, viral diseases, bacterial disease, serological surveys, various European countries.

Fuller, W.A. **Canada and the "buffalo", Bison bison: a tale of two herds.** *Canadian Field Naturalist.* 2002 January-March; 116 (1) 141-159 ISSN: 0008-3550

**NAL call number:** 410.9 OT8

**Descriptors:** *Bison bison*, plains buffalo, conservation measures, hear relocation, disease control, bacterial diseases, bovine tuberculosis and brucellosis, *Mycobacterium*, *Brucella abortus*, Wood Buffalo National Park, Relocation, herd management and culling, historical review, Alberta, Canada.

Garnett, B.T.; Delahay, R.J.; Roper, T.J. **Use of cattle farm resources by badgers (*Meles meles*) and risk of bovine tuberculosis (*Mycobacterium bovis*) transmission to cattle.** *Proceedings of the Royal Society of London. Series B, Biological Sciences.* July 22, 2002. 269 (1499) 1487-1491. ISSN: 0962-8452

**NAL call number:** 501 L84B

**Descriptors:** cattle, badgers, *Meles meles*, disease transmission, cattle housing, feeds, contamination, *Mycobacterium bovis*.

Grobler, D.G.; Michel, A.L.; de Klerk, L.M.; Bengis, R.G. **The gamma-interferon test: its usefulness in a bovine tuberculosis survey in African buffaloes (*Syncerus caffer*) in the Kruger National Park.** *Onderstepoort Journal of Veterinary Research.* 2002. 69 (3) 221-227.

**NAL call number:** 41.8 On1

**Descriptors:** bovine tuberculosis, African buffalo, *Syncerus caffer*, wild animals, *Mycobacterium bovis*, gamma interferon assay technique, herd health, culling of reactors, serological surveys, Olifants River, Kruger National Park, South Africa.

Hancox, M. **The great badgers and bovine TB debate.** *Journal of Agricultural Science.* 2002, 139 (2) 223-226. ISSN: 0021-8596

**NAL call number:** 10 J822

**Descriptors:** badgers, cattle, wildlife disease reservoir, disease control program, public health risks, risk assessment, tuberculosis, *Mycobacterium tuberculosis*, zoonoses.

Hutchings, M.R.; Service, Katrina, M.; Harris, S. **Is population density correlated with faecal and urine scent marking in European badgers (*Meles meles*) in the UK?** *Mammalian Biology.* 2002; 67 (5) 286-293 ISSN: 1616-5047 Note: In English with English and German summaries.

**NAL call number:** QL700 Z4

**Descriptors:** badgers, *Meles meles*, wild animal disease reservoir, fecal and urine scent marking behavior, dispersed patterns vs use of latrines, population density relationships, transmission, *Mycobacterium bovis*, differences in behavior vs population density.

Kaneene, J.B.; Bruning-Fann, C.S.; Granger, L.M.; Miller, R.; Porter-Spalding, B.A. **Environmental and farm management factors associated with tuberculosis on cattle farms in northeastern Michigan.** *Journal of the American Veterinary Medical Association.* Sept 15, 2002. 221 (6) 837-842. ISSN: 0003-1488

**NAL call number:** 41.8 AM3

**Descriptors:** cattle, farms, tuberculosis, *Mycobacterium bovis*, farm management, environmental factors, risk factors, wild animals, disease prevalence, livestock numbers, ponds, streams, Michigan.

Kaneene, J.B.; VanderKlok, M.; Bruning-Fann, C.S.; Palmer, M.V.; Whipple, D.L.; Schmitt, S.M.; Miller, R.A.

**Prevalence of *Mycobacterium bovis* infection in cervids on privately owned ranches.** *Journal of the American Veterinary Medical Association*. 2002. 220 (5) 656-659. ISSN: 0003-1488

**NAL call number:** 41.8 AM3

**Descriptors:** analytical methods, diagnosis, diagnostic techniques, disease prevalence, epidemiology, tuberculosis, Cervidae, coyotes, deer, tuberculosis, *Mycobacterium bovis*, wildlife, slaughter and skin testing, disease transmission, Michigan.

Livingstone, P.; McInnes, J.; Carter, C.; Ryan, T.; Hancox, N. **Controlling bovine tuberculosis in cattle where there is a wildlife source of infection.** *Bulletin of the International Dairy Federation*. 2002. No. 372, 33-42. Note: *A fresh perspective for managing milk-borne diseases. Proceedings of the Animal Health Conference, IDF World Dairy Summit 2001, Auckland, New Zealand, International Dairy Federation, Brussels, Belgium.*

**NAL call number:** 44.9 In82B

**Descriptors:** costs, dairy cattle, dairy herds, disease control, disease transmission, disease vectors, tuberculosis, vector control, wild animals, wild pigs, cattle, *Cervus elaphus*, ferrets, *Mycobacterium tuberculosis*, pigs, red deer, *Trichosurus vulpecula*, bovine tuberculosis, New Zealand.

McKenzie, J.S.; Morris, R.S.; Pfeiffer, D.U.; Dymond, J.R. **Application of remote sensing to enhance the control of wildlife-associated *Mycobacterium bovis* infection.** *Photogrammetric Engineering and Remote Sensing*. 2002. 68 (2) 153-159.

**NAL call number:** 325.28 P56

**Descriptors:** cost benefit analysis, disease control, remote sensing, tuberculosis, disease vector control, *Mycobacterium bovis*, *Trichosurus vulpecula*, brushtail possums, New Zealand.

Michel, A.L. **Implications of tuberculosis in African wildlife and livestock.** In: E.P.J. Gibbs and B.H. Bokma, B.H. (editors). *The Domestic Animal/Wildlife Interface: Issues for Disease Control, Conservation, Sustainable Food Production, and Emerging Diseases Conference and Workshop Organised by the Society for Tropical Veterinary Medicine and the Wildlife Diseases Association Wildlife and Livestock, Disease and Sustainability: What Makes Sense? Pilanesberg National Park, South Africa, 22-27 July, 2001. Annals of New York Academy of Sciences Vol. 969. 2002: 251-255. ISBN: 1573314382*

**Descriptors:** cattle, wild animals, *Mycobacterium bovis*, *Papio ursinus*, *Potamochoerus-porcus*, African buffalo, *Syncerus caffer*, *Tragelaphus scriptus*, *Tragelaphus strepsiceros*, *Panthero leo*, *Crocuta crocuta*, disease control, disease transmission between wildlife species and domestic livestock.

Morley, C.G. **Ferret (*Mustela furo*) abundance, survival and recruitment on farmland in North Canterbury, New Zealand.** *New Zealand Journal of Zoology*. 2002. 29 (1) 23-31.

**NAL call number:** QL1 A1N4

**Descriptors:** wild animals, disease reservoirs, ferret behavior, trapping programs, *Mycobacterium bovis*, seasonal variation, population density, cost benefit analysis, control programs, New Zealand.

Nishi, J.S.; Elkin, B.T.; Ellsworth, T.R. **The Hook Lake Wood Bison Recovery Project: can a disease-free captive wood bison herd be recovered from a wild population infected with bovine tuberculosis and brucellosis?** In: E.P.J. Gibbs and B.H. Bokma. (editors). *The Domestic Animal/Wildlife Interface: Issues for Disease Control, Conservation, Sustainable Food Production, and Emerging Diseases Conference and Workshop Organised by the Society for Tropical Veterinary Medicine and the Wildlife Diseases Association Wildlife and Livestock, Disease and Sustainability: What Makes Sense? Pilanesberg National Park, South Africa, 22-27-July,-2001. Annals of New York Academy of Sciences Vol. 969 2002; 229-235. ISBN: 1573314382*

**Descriptors:** captive disease free herd of wood bison, wildlife conservation, source herd has *Mycobacterium bovis* and *Brucella abortus*, several strategies, removing newborn calves, testing calves for maternal antibodies before inclusion, isolating calves in pairs, prophylactic treatment with antibiotics, whole herd testing program to remove reactors, 58 member founder herd, disease prevention and control., Canada.

Nishi, J.S.; Stephen, C.; Elkin, B.T. **Implications of agricultural and wildlife policy on management and eradication of bovine tuberculosis and brucellosis in free-ranging wood bison of Northern Canada.** In: E.P.J. Gibbs and B.H. Bokma. (editors). *The Domestic Animal/Wildlife Interface: Issues for Disease Control, Conservation, Sustainable Food Production, and Emerging Diseases Conference and Workshop Organised by the Society for*

*Tropical Veterinary Medicine and the Wildlife Diseases Association Wildlife and Livestock, Disease and Sustainability: What Makes Sense? Pilanesberg National Park, South Africa, 22-27-July,-2001. Annals of New York Academy of Sciences Vol. 969. 2002: 236-244. ISBN: 1573314382*

**Descriptors:** bison (*Bison bison*), free ranging wild animals, game animals, *Mycobacterium bovis*, *Brucella abortus*, disease eradication, disease prevention and control, agricultural policy, epidemiology, wildlife conservation, wildlife management, domestic animal/wild life interface issues, Canada.

Nugent, G.; Whitford, J.; Young, N. **Use of released pigs as sentinels for *Mycobacterium bovis*.** *Journal of Wildlife Diseases.* 2002, 38 (4) 665-677. ISSN: 0090-3558

**NAL call number:** 41.9 W64B

**Descriptors:** feral pigs, *Sus scrofa*, disease surveys, epidemiology, sentinel animals, sentinel surveillance, *Mycobacterium bovis*, tuberculosis, brushtail possum, *Trichosurus vulpecula*, New Zealand.

O'Brien, D.J.; Schmitt, S.M.; Fierke, J.S.; Hogle, S.A.; Winterstein, S.R.; Cooley, T.M.; Moritz, W.E.; Diegel, K.L.; Fitzgerald, S.D.; Berry, D.E. **Epidemiology of *Mycobacterium bovis* in free-ranging white-tailed deer, Michigan, USA, 1995-2000.** *Preventive Veterinary Medicine.* 2002; 54 (1): 47-63. ISSN: 0167-5877

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503315/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503315/description#description)

**NAL Call Number:** SF601.P7

**Descriptors:** white tailed deer, *Odocoileus virginianus*, *Mycobacterium bovis*, epidemiology, outbreaks surveillance, reservoir hosts, disease prevalence, risk factors, postmortem examinations, sex differences, age differences, geographical variation, Michigan.

Palmer, M.V.; Waters, W.R.; Whipple, D.L. **Milk containing *Mycobacterium bovis* as a source of infection for white-tailed deer fawns (*Odocoileus virginianus*).** *Tuberculosis.* 2002, 82 (4-5) 161-165. ISSN: 1472-9792

**Descriptors:** deer, *Mycobacterium bovis*, *Odocoileus virginianus*, female animals, lymph nodes, contaminated milk transmammary transmission, tuberculosis.

Palmer, M.V.; Gosch, G.; Lyon, R.; Waters, W.R.; Whipple, D.L. **Apoptosis in lymph node granulomas from white-tailed deer (*Odocoileus virginianus*) experimentally infected with *Mycobacterium bovis*.** *Journal of Comparative Pathology.* 2002. 127 (1) 7-13.

**NAL call number:** 41.8 J82

**Descriptors:** apoptosis, experimental infection, granuloma, inflammation, lymph nodes, morphometrics, tuberculosis, *Mycobacterium bovis*, *Odocoileus virginianus*, intra-tonsillar injection.

Palmer, M.V.; Waters, W.R.; Whipple, D.L. **Lesion development in white-tailed deer (*Odocoileus virginianus*) experimentally infected with *Mycobacterium bovis*.** *Veterinary Pathology.* 2002. 39 (3) 334-340.

**NAL call number:** 41.8 P27

**Descriptors:** clinical aspects, pathogenesis, experimental infection, intra-tonsillar instillation, lesions, respiratory diseases, tuberculosis, wild animals, *Mycobacterium bovis*, white tailed deer, *Odocoileus virginianus*, Iowa.

Palmer, M.V.; Waters, W.R.; Whipple, D.L. **Susceptibility of raccoons (*Procyon lotor*) to infection with *Mycobacterium bovis*.** *Journal of Wildlife Diseases.* Apr 2002. 38 (2) 266-274. ISSN: 0090-3558

**NAL call number:** 41.9 W64B

**Descriptors:** tuberculosis, disease transmission, experimental infection, oral administration, intravenous injection, *Mycobacterium bovis*, Michigan

Palmer, M.V.; Whipple, D.L.; Butler, K.L.; Fitzgerald, S.D.; Bruning-Fann, C.S.; Schmitt, S.M. **Tonsillar lesions in white-tailed deer (*Odocoileus virginianus*) naturally infected with *Mycobacterium bovis*.** *Veterinary Record.* Aug 3, 2002. 151 (5) 149-150. ISSN: 0042-4900

**NAL call number:** 41.8 V641

**Descriptors:** lesions, tonsils, *Odocoileus virginianus*, *Mycobacterium bovis*, pathogenesis, tuberculosis, Michigan.

Pavlik, I.; Machackova, M.; Ayele, W.Y.; Lamka, J.; Parmova, I.; Melicharek, I.; Hanzlikova, M.; Kormendy, B.; Nagy, G.; Cvetnic, Z.; Ocepek, M.; Lipiec, M. **Incidence of bovine tuberculosis in wild and domestic animals other than cattle in six Central European countries during 1990-1999.** *Veterinarni Medicina.* 2002. 47 (5) 122-131.

**NAL call number:** 41.9 C333

**Descriptors:** disease prevalence, disease transmission, domestic animals, epidemiology, game animals, tuberculosis, sheep, boars, wild goats, *Bison bison*, *Bison bonasus*, *Camelus bactrianus*, Bactrian camels, *Casuarius*, cassowary, *Cervus elaphus*, *Connochaetes taurinus*, dogs, zoo animals, *Felis concolor*, puma, sitatungas, elands, gnu, Vietnamese pot-bellied pig, *Giraffa camelopardalis*, giraffes, *Mycobacterium bovis*, pigs, red deer, sheep, *Tapirus terrestris*, *Taurotragus oryx*, *Tragelaphus*, Central Europe.

Payeur, Janet B.; Church, S.; Mosher, L.; Robinson-Dunn, B.; Schmitt, S.; Whipple, D. **Bovine tuberculosis in Michigan wildlife.** *Annals of the New York Academy of Sciences*. 2002; 969: 259-261 ISSN: 0077-8923

**NAL call number:** 500 N484

**Descriptors:** wild animals, bacterial diseases, *Mycobacterium bovis*, prevalence in wildlife and livestock, wild animal as disease reservoirs, Michigan.

Pons, L. **An easy, inexpensive test detects tuberculosis in livestock and wildlife.** *Agricultural Research*. Nov 2002. 50 (11) 20-21. ISSN: 0002-161X

**URL:** <http://www.ars.usda.gov/is/AR/>

**NAL call number:** 1.98 Ag84

**Descriptors:** tuberculosis, animal diseases, livestock, wildlife, testing and disease control, *Mycobacterium bovis*, blood sampling, diagnostic techniques, assays, USA.

Prodinger, W.M.; Eigentler, A.; Allerberger, F.; Schonbauer, M.; Glawischnig, W. **Infection of red deer, cattle, and humans with *Mycobacterium bovis* subsp. *caprae* in western Austria.** *Journal of Clinical Microbiology*. June 2002. 40 (6) 2270-2272. ISSN: 0095-1137

**NAL call number:** QR46.J6

**Descriptors:** tuberculosis, red deer, cattle, zoonotic aspects, epidemiology, disease transmission, *Mycobacterium bovis* ssp. *caprae*.

Ramsey, D.; Spencer, N.; Caley, P.; Efford, M.; Hansen, K.; Lam, M.; Cooper, D. **The effects of reducing population density on contact rates between brushtail possums: implications for transmission of bovine tuberculosis.** *Journal of Applied Ecology*. 2002. 39 (5) 806-818.

**NAL call number:** 410 J828

**Descriptors:** animal behavior, animal ecology, breeding season, contacts, disease transmission, mating behavior, estrus, population density, reservoir hosts, tuberculosis, wild animals, *Mycobacterium bovis*, *Trichosurus vulpecula*, New Zealand.

Schmitt, Stephen M.; O'Brien, Daniel J.; Bruning-Fann, Colleen S.; Fitzgerald, Scott D. **Bovine tuberculosis in Michigan wildlife and livestock.** *Annals of the New York Academy of Sciences*. 2002; 969: 262-268 ISSN: 0077-8923

**NAL call number:** 500 N484

**Descriptors:** wild animals, bacterial diseases, *Mycobacterium bovis*, prevalence in wildlife and livestock, Michigan.

Simpson, V.R. **Wild animals as reservoirs of infectious diseases in the UK.** *Veterinary Journal*. Mar 2002. 163 (2) 128-146. ISSN: 1090-0233

<http://intl.elsevierhealth.com/journals/tvj/>

**NAL call number:** SF601.V484

**Abstract:** This review aims to illustrate the extent to which wildlife act as reservoirs of infectious agents that cause disease in domestic stock, pet and captive animals and humans. More than 40 agents are described. In the case of some of these, e.g. *Cryptosporidium* spp., *Escherichia coli* O157 and malignant catarrhal fever, the current evidence is that wildlife either does not act as a reservoir or is of limited importance. However, in the case of many important diseases, including bovine tuberculosis, Weil's disease, Lyme disease, avian influenza, duck virus enteritis and louping ill, wild animals are considered to be the principal source of infection. Wildlife may be involved in the epidemiology of other major diseases, such as neosporosis, Johne's disease, mucosal disease and foot and mouth disease, but further studies are needed. The UK would benefit from a more positive approach to the study of wildlife and the infections they harbour.

**Descriptors:** wild animals, bacterial diseases, viral diseases, parasitoses, reservoir hosts, livestock, epidemiology, disease transmission, pathogens, literature reviews, UK.

Sleeman, D.P.; Cussen, R.E.; Southey, A.K.; O'Leary, D. **The badgers *Meles meles* (L.) of Coney Island, Co Sligo.** *Irish Naturalists' Journal*. 2002; 27(1): 10-18 ISSN: 0021-1311

**NAL call number:** 410 IR42

**Descriptors:** *Meles meles*, wild badgers as a bacterial disease reservoir, disease transmission, *Mycobacterium*, tuberculosis, population dynamics, island habitat, Republic of Ireland.

Rogers, L.M.; Hounscome, T.D.; Cheeseman, C.L. **An evaluation of passive integrated transponders (PITs) as a means of permanently marking Badgers (*Meles meles*).** *Mammal Review*. 2002, 32 (1) 63-65. ISSN: 0305-1838

**NAL call number:** QL700.M24

**Descriptors:** badgers, cattle, *Meles meles*, *Mycobacterium bovis*, identification, markers, sentinel animals, sentinel surveillance, transponders, tuberculosis, England.

Rose, H. **Recognising the symptoms of tuberculosis in the field: a guide for deer stalkers.** *Deer, Journal of the British Deer Society*. 2002. 12 (3) 160-161.

**Descriptors:** deer, tuberculosis infections, clinical aspects, disease prevalence, epidemiology, symptoms, hunting, recognizing infected animals, *Mycobacterium*, UK.

Skinner, M.A.; Keen, D.L.; Parlane, N.A.; Yates, G.F.; Buddle, B.M. **Increased protection against bovine tuberculosis in the brushtail possum (*Trichosurus vulpecula*) when BCG is administered with killed *Mycobacterium vaccae*.** *Tuberculosis*. 2002. 82 (1) 15-22.

**Descriptors:** immunization, tuberculin, tuberculosis, vaccination, *Mycobacterium vaccae*, *Trichosurus vulpecula*, wild brushtail possum as disease reservoir, New Zealand.

Waters, W.R.; Palmer, M.V.; Whipple, D.L. ***Mycobacterium bovis*-infected white-tailed deer (*Odocoileus virginianus*): detection of immunoglobulin specific to crude mycobacterial antigens by ELISA.** *Journal Veterinary Diagnostic Investigation*. Nov 2002. 14 (6): 470-475. ISSN: 1040-6387.

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** deer, *Odocoileus virginianus*, *Mycobacterium bovis*, ELISA, antigens, antibody detection, antigen antibody reactions.

Waters, W.R.; Palmer, M.V.; Sacco, R.E.; Whipple, D.L. **Nitric oxide production as an indication of *Mycobacterium bovis* infection in white-tailed deer (*Odocoileus virginianus*).** *Journal of Wildlife Diseases*. Apr 2002. 38 (2) 338-343. ISSN: 0090-3558

**NAL call number:** 41.9 W64B

**Descriptors:** white-tailed deer, *Odocoileus virginianus*, tuberculosis, immune response, nitrites, macrophage activation, Michigan.

## 2001

Allen, W.; Bosch, O.; Kilvington, M.; Oliver, J.; Gilbert, M. **Benefits of collaborative learning for environmental management: applying the integrated systems for knowledge management approach to support animal pest control.** *Environmental Management*. Feb 2001. 27 (2) 215-223. ISSN: 0364-152X

**NAL call number:** HC79.E5E5

**Descriptors:** diffusion of information, information services, internet, Bovidae, tuberculosis, case studies, *Mycobacterium*.

Anonymous. **Notifiable disease and deer: BDS training committee notice.** *Deer, Journal of the British Deer Society*. 2001. 11 (10) 554-556.

**Descriptors:** deer, disease control, disease transmission, disease vectors, epidemiology, foot and mouth disease, lesions, reservoir hosts, tuberculosis, *Mycobacterium*, Wales, Scotland, England, UK.

Artois, M.; Delahay, R.; Guberti, V.; Cheeseman, C. **Control of infectious diseases of wildlife in Europe.** *Veterinary Journal*. Sept 2001. 162 (2) 141-152. ISSN: 1090-0233

<http://intl.elsevierhealth.com/journals/tvj/>

**NAL call number:** SF601.V484

**Abstract:** During the last 30 years, new epidemiological patterns have emerged as free-ranging wildlife have become progressively more involved in the epidemiology of both common and emerging infectious diseases of humans and domestic animals. This has been seen in rabies, bovine tuberculosis and more recently in wild-boar classical swine fever. Emerging diseases are of interest to veterinarians as well as public health officials but attempts to control these diseases have not always been successful as in wildlife populations control of either host or pathogen can present particular problems. Lessons should be learnt from previous experiences to help in the management of new emerging diseases in the future.

**Descriptors:** wildlife, animal diseases, *Mycobacterium*, disease control, infectious diseases, disease prevalence, Europe.

Avylov, Ch. **Problems of rat control on pig farms.** *Svinovodstvo*. Moskva. 2001. No. 3, 17-20. Note: In Russian.

**NAL call number:** 46.8 SV33

**Descriptors:** rats as disease vectors, zoonotic disease, pig farms, dead and trapped rats, *Brucella*, brucellosis, tuberculosis, *Mycobacterium*, leptospirosis, pest control and eradication.

Barlow, N.D.; Norbury, G. **A simple model for ferret population dynamics and control in semi-arid New Zealand habitats.** *Wildlife Research*. 2001. 28 (1) 87-94.

**NAL call number:** S960 W5

**Descriptors:** *Mustela furo*, bovine tuberculosis, native fauna, population control of an invasive species, Ricker model, population dynamics, rabbit density, pest control.

Bengis, R.G.; Keet, D.F.; Michel, A.L.; Kriek, N.P.J. **Tuberculosis, caused by *Mycobacterium bovis*, in a kudu (*Tragelaphus strepsiceros*) from a commercial game farm in the Malelane area of the Mpumalanga Province, South Africa.** *Onderstepoort Journal of Veterinary Research*. 2001. 68 (3) 239-241.

**NAL call number:** 41.8 On1

**Descriptors:** clinical aspects, diagnosis, lymph nodes, tuberculosis, *Mycobacterium bovis*, kudus, *Tragelaphus strepsiceros*, South Africa.

Bruning-Fann, C.S.; Schmitt, S.M.; Fitzgerald, S.D.; Fierke, J.S.; Friedrich, P.D.; Kaneene, J.B.; Clarke, K.A.; Butler, K.L.; Payeur, J.B.; Whipple, D.L.; Cooley, T.M.; Miller, J.M.; Muzo, D.P. **Bovine tuberculosis in free-ranging carnivores from Michigan.** *Journal of Wildlife Diseases*. Jan 2001. 37 (1) 58-64. ISSN: 0090-3558

**NAL call number:** 41.9 W64B

**Descriptors:** disease prevalence and transmission, wildlife, lynx, *Lynx rufus*, Mustelidae, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, deer, *Odocoileus virginianus*, coyotes, *Procyon lotor*, bears, *Ursus americanus*, *Vulpes cinereoargenteus*, foxes, *Vulpes vulpes*, raccoons, bobcat, Michigan, USA.

Byrom, A.E. **Ferrets as vectors of bovine Tb in New Zealand: a review.** *Proceedings of the New Zealand Society of Animal Production*. 2001. 61: 60-63. Note: 61st Conference, Lincoln University, New Zealand, 25-27 June 2001.

**NAL call number:** 49.9 N483

**Descriptors:** age differences, disease prevalence, disease vectors, hosts, livestock, reviews, sex differences, tuberculosis, wild animals, cattle, ferrets, *Mycobacterium bovis*, New Zealand.

Caley, P.; Ramsey, D. **Estimating disease transmission in wildlife, with emphasis on leptospirosis and bovine tuberculosis in possums, and effects of fertility control.** *Journal of Applied Ecology*. 2001. 38 (6) 1362-1370.

**NAL call number:** 410 J828

**Descriptors:** animal behavior, animal models, disease transmission coefficients in wildlife, epidemiology, mating behavior, sterilization, *Leptospira interrogans*, *Mycobacterium bovis*, bovine tuberculosis, *Trichosurus vulpecula*.

Caley, P.; Coleman, J.D.; Hickling, G.J. **Habitat-related prevalence of macroscopic *Mycobacterium bovis* infection in brushtail possums (*Trichosurus vulpecula*), Hohonu Range, Westland, New Zealand.** *New Zealand Veterinary Journal*. 2001. 49 (3) 82-87.

**NAL call number:** 41.8 N483

**Descriptors:** disease prevalence, *Mycobacterium bovis*, tuberculosis, epidemiology in brushtail possums, geographical distribution, high altitude habitats, infection, landforms, lowland areas, mountain areas, population density, slopes, spatial distribution, tuberculosis, *Trichosurus vulpecula*, New Zealand.

Chambers, M.A.; Stagg, D.; Gavier-Widen, D.; Lowrie, D.; Newell, D.; Hewinson, R.G. **A DNA vaccine encoding MPB83 from *Mycobacterium bovis* reduces *M. bovis* dissemination to the kidneys of mice and is expressed in primary cell cultures of the European badger (*Meles meles*).** *Research in Veterinary Science*. Oct 2001. 71 (2) 119-126. ISSN: 0034-5288

**NAL call number:** 41.8 R312

**Abstract:** Nucleic acid (DNA) vaccination against tuberculosis in the European badger (*Meles meles*) is one approach to addressing the escalating problem of bovine tuberculosis in Great Britain. The aim of vaccination is to reduce the burden of tuberculosis within the badger population and the shedding of *Mycobacterium bovis* to levels that would break the transmission of infection to cattle. To this end, the vaccine would be required to limit the amount of disseminated tuberculosis in the badger, especially dissemination to the kidney from where *M. bovis* can be shed in the urine. A promising candidate DNA vaccine encoding a 26 kDa major antigen (MPB83) of *M. bovis* was evaluated in a mouse model of disseminated *M. bovis* infection. Using the DNA vaccine, protection against infection of the kidney was found to be greater than that achieved with the current live vaccine, Bacille Calmette-Guerin (BCG). Kidney tissue and skeletal muscle from the badger was used to derive primary cell cultures in which to examine the expression of MPB83 following transfection with the DNA vaccine. Kidney cortex gave rise to a monotypic culture of epithelial cells whilst the muscle gave rise to a mixed culture of fibroblasts and myoblasts. During culture the myoblasts differentiated into multinucleated myotubes, verified by immunofluorescent detection of mammalian desmin. Successful expression of MPB83 by transfected epithelial and myotube cells was confirmed by immunofluorescence using a monoclonal antibody specific to the protein. These observations fulfill the early requirements for the development of a DNA vaccine for badger tuberculosis.

**Descriptors:** *Meles meles*, badgers, cell cultures, DNA vaccines, *Mycobacterium bovis*, antigens, morphology, kidneys, skeletal muscle, mice, transfection, vaccine development, tuberculosis.

Coleman, J.D.; Cooke, M.M. ***Mycobacterium bovis* infection in wildlife in New Zealand.** *Tuberculosis*. 2001. 81 (3) 191-202.

**Descriptors:** wild animals, *Mycobacterium bovis*, animal pathology, disease prevalence, epidemiology, hosts, tuberculosis, review, New Zealand.

Coleman, J.D. **Possums as vectors of Tb in livestock.** *Proceedings of the New Zealand Society of Animal Production*. 2001. 61: 57-59. Note: 61st Conference, Lincoln University, New Zealand, 25-27 June 2001.

**NAL call number:** 49.9 N483

**Descriptors:** animal pathology, disease transmission, disease vectors, epidemiology, lung lesions, cattle, livestock, lymph nodes, tuberculosis, vector control, wild animals, *Mycobacterium bovis*, *Trichosurus vulpecula*, brushtail possums, New Zealand.

Corner, L.A.L.; Buddle, B.M.; Pfeiffer, D.U.; Morris, R.S. **Aerosol vaccination of the brushtail possum (*Trichosurus vulpecula*) with bacille Calmette-Guerin: the duration of protection.** *Veterinary Microbiology*. July 26, 2001. 81 (2) 181-191. ISSN: 0378-1135

**NAL call number:** SF601.V44

**Abstract:** Bovine tuberculosis is endemic in wild brushtail possums (*Trichosurus vulpecula*) in New Zealand. The disease is controlled by reducing or eliminating infected possum populations, but control methods do not kill all possums in the targeted area, leaving some tuberculous possums to maintain the disease. Vaccination with bacille Calmette-Guerin (BCG) has been shown to provide significant levels of protection. Vaccination is a potential alternative or complementary control strategy if protection is long lasting. Captive possums were vaccinated with a single dose of BCG by intranasal aerosol and challenged by intratracheal instillation of *Mycobacterium bovis* 2, 6 or 12 months after vaccination. Vaccination produced significant immunity as measured by the lymphocyte proliferative response to bovine PPD and protection in response to challenge. The protective response was seen as a decrease in the mass of pulmonary lesions and decreased dissemination to the abdominal organs and body lymph nodes. The protective effect was strongest at 2 months after vaccination but was still present at a lower level at 12 months. Delivery of an aerosol vaccine to possums in the wild using a self-delivery system could contribute substantially to wildlife tuberculosis control.

**Descriptors:** *Trichosurus vulpecula*, vaccination, aerosols, *Mycobacterium bovis*, reservoir hosts, disease control, duration, aerosol delivered live vaccines, immunity, lymphocyte transformation, lesions, symptoms, lymph nodes, tuberculosis control, New Zealand.

Correa, S.H.R.; de C. Passos, E.; Fowler, M.E. (ed.); Cubas, Z.S. **Wild animals and public health. Biology, Medicine, and Surgery of South American Wild Animals**. 2001. p. 493-499. Iowa State University Press, Ames, USA.

**NAL call number:** SF996.4 B56 2001

**Descriptors:** bacterial diseases, *Chlamydia*, campylobacteriosis, leptospirosis, occupational health, rabies, salmonellosis, shigellosis, toxoplasmosis, tuberculosis, wild animals, zoonoses.

de Lisle, G.W. **Bovine tuberculosis: a view from down under**. *Veterinary Journal*. May 2001. 161 (3) 220-221. ISSN: 1090-0233

**URL:** <http://intl.elsevierhealth.com/journals/tvj/>

**NAL call number:** SF601.V484

**Descriptors:** cattle, *Mycobacterium bovis*, deer, badgers, disease control programs, tuberculosis disease control, UK, New Zealand.

de Vos, V.; Bengis, R.G.; Kriek, N.P.J.; Michel, A.; Keet, D.F.; Raath, J.P.; Huchzermeyer, H.F.K.A. **The epidemiology of tuberculosis in free-ranging African buffalo (*Syncerus caffer*) in the Kruger National Park, South Africa**. *Onderstepoort Journal of Veterinary Research*. 2001. 68 (2) 119-130.

**NAL call number:** 41.8 On1

**Descriptors:** bovine tuberculosis, *Mycobacterium bovis*, African buffalo, *Syncerus caffer*, disease survey results 1990-1996, transmission, infected cattle herds, chacma baboon, *Papio ursinus*, lion *Panthera leo*, cheetah, *Acinonyx jubatus*, kudu, *Tragelaphus strepsiceros*, leopard, *Panthera pardus*.

Delahay, R.J.; de Leeuw, A.N.S.; Claridge, M.; Harris, A.; Cheeseman, C.L.; Barlow, A.M.; Millar, M.F.; Clifton-Hadley, R.S. **First report of *Mycobacterium bovis* in a muntjac deer**. *Veterinary Record*. 2001. 149 (3) 95-96. ISSN: 0042-4900.

**NAL call number:** 41.8 V641

**Descriptors:** case reports, wild animals, *Muntiacus*, *Mycobacterium bovis*, first recorded case, UK.

Delahay, R.J.; Cheeseman, C.L.; Clifton-Hadley, R.S.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Wildlife disease reservoirs: the epidemiology of *Mycobacterium bovis* infection in the European badger (*Meles meles*) and other British mammals**. *Tuberculosis*. 2001. 81 (1-2) 43-49. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** animal behavior, disease distribution, disease prevalence, disease transmission, epidemiology, reservoir hosts, wildlife, cats, deer, cattle, foxes, ferrets, badgers, mink, rats, *Rattus norvegicus*, *Talpa europaea*, Great Britain, New Zealand.

Enticott, G. **Calculating nature: the case of badgers, bovine tuberculosis and cattle**. *Journal of Rural Studies*. Apr 2001. 17 (2) 149-164. ISSN: 0743-0167

**NAL call number:** HT401.J68

**Abstract:** The aim of the paper is to examine the governmentalities associated with attempts to manage nature. In particular, it assesses the role that numbers have played in rural governance. Numbers are seen as an important tool of modern government. However, like other aspects of science, their use in governing nature has been contested by other epistemologies. Drawing upon efforts to regulate the spread of bovine tuberculosis in cattle, the paper firstly examines how numbers have been used in this policy debate. Secondly, the paper outlines three epistemologies of nature--nature as numbers, nature as known and ecological nature--which have been employed in contesting government policy. Finally the paper concludes by analysing the interactions of these knowledges of nature and considering the voice of the badger in these constructions of its identity.

**Descriptors:** badgers, dairy cattle, *Mycobacterium tuberculosis*, disease control, disease transmission, Ministries of Agriculture, government policy, rural areas, farmers' attitudes, UK.

Forrester, G.J.; Delahay, R.J.; Clifton-Hadley, R.S. **Screening badgers (*Meles meles*) for *Mycobacterium bovis* infection by using multiple applications of an ELISA**. *Veterinary Record*. 2001. 149 (6) 169-172. ISSN: 0042-4900

**NAL call number:** 41.8 V641

**Descriptors:** diagnosis, diagnostic techniques, diagnostic value, sensitivity of ELISA screening, badgers as disease vectors, tuberculosis, *Mycobacterium bovis*, *Meles meles*, cattle, badgers.

Gavier-Widen, D.; Chambers, M.A.; Palmer, N.; Newell, D.G.; Hewinson, R.G. **Pathology of natural *Mycobacterium***

**bovis infection in European badgers (*Meles meles*) and its relationship with bacterial excretion.** *Veterinary Record*. Mar 10, 2001. 148 (10) 299-304. ISSN: 0042-4900

**NAL call number:** 41.8 V641

**Descriptors:** *Meles meles*, European badger, *Mycobacterium bovis*, shedding of *Mycobacterium bovis* organism, tuberculosis, histopathology, trachea, lymph nodes, urine, lesions, lungs, animal tissues.

Hammond, R.F.; McGrath, G.; Martin, S.W. **Irish soil and land-use classifications as predictors of numbers of badgers and badger setts.** *Preventive Veterinary Medicine*. 2001. 51 (3-4) 137-148.

**NAL call number:** SF601 P7

**Descriptors:** badgers, *Meles meles*, land use, spatial distribution, disease reservoirs, tuberculosis, *Mycobacterium*, Irish Republic.

Hutchings, M.R.; Service, K.M.; Harris, S. **Defecation and urination patterns of badgers *Meles meles* at low density in south west England.** *Acta Theriologica*. 2001. 46 (1) 87-96.

**NAL call number:** 410 AC88

**Descriptors:** defecation, disease transmission, feces, latrine areas, badgers, population distribution, population dynamics, risk assessment, cattle, risk factors, seasonal variations, spatial distribution, tuberculosis, urination patterns, urine, disease reservoirs, *Meles meles*, England.

Keet, D.F.; Kriek, N.P.J.; Bengis, R.G.; Michel, A.L. **Tuberculosis in kudu (*Tragelaphus strepsiceros*) in the Kruger National Park.** *Onderstepoort Journal of Veterinary Research*. 2001. 68 (3) 225-230.

**NAL call number:** 41.8 On1

**Descriptors:** kudu, generalized tuberculosis, *Mycobacterium bovis*, lymphadenitis, head, neck, thorax, mesentery, granulomatous pneumonia, control measures, sources of infection, disease transmission, DNA analysis, South Africa.

Mc Ilroy, J.C. **Advances in New Zealand mammalogy 1990-2000: feral pig.** *Journal of the Royal Society of New Zealand*. 2001. 31 (1) 225-231.

**NAL call number:** QH301 R62

**Descriptors:** feral pigs, biological development, damage, food, geographical distribution, geographical variation, mortality, pest control, poisoning of animal pests, population density, population dynamics, reproduction, social behavior, *Mycobacterium tuberculosis*.

Montali, R.J.; Mikota, S.K.; Cheng, L.I. ***Mycobacterium tuberculosis* in zoo and wildlife species.** *Revue Scientifique et Technique Office International des Epizooties*. 2001. 20 (1) 291-303. Note: In English with French and Spanish summaries.

**NAL call number:** SF781 R4

**Descriptors:** diagnosis, disease survey, prevalence, wild and zoo animals, disease control, zoonotic diseases.

Moutou, F.; Artois, M.; de V Cheuiche, A.J. **Os animais selvagens como reservatórios potenciais de zoonoses. [Wild animals as potential deposits of zoonoses.]** *A Hora Veterinaria*. 2001. 21 (124) 29-32. Note: In Portuguese with English and French summaries.

**Descriptors:** disease transmission, infectious diseases, tuberculosis, wild animals, zoonoses.

O'Brien, D.J.; Fitzgerald, S.D.; Lyon, T.J.; Butler, K.L.; Fierke, J.S.; Clarke, K.R.; Schmitt, S.M.; Cooley, T.M.; Berry, D.E. **Tuberculous lesions in free-ranging white-tailed deer in Michigan.** *Journal of Wildlife Diseases*. 2001. 37 (3) 608-613. ISSN: 0090-3558

**NAL call number:** 41.9 W64B

**Descriptors:** tuberculosis, wildlife disease surveys, epidemiology, lesions, tuberculosis, *Mycobacterium bovis*, white tailed deer, *Odocoileus virginianus*, Michigan, USA.

Palmer, M.V.; Whipple, D.L.; Waters, W.R. **Experimental deer-to-deer transmission of *Mycobacterium bovis*.** *American Journal of Veterinary Research*. May 2001. 62 (5) 692-696. ISSN: 0002-9645

**NAL call number:** 41.8 Am3A

**Descriptors:** deer, *Mycobacterium bovis*, disease transmission, experimental infections, secretions saliva, pelleted feeds, tuberculosis, lungs, lymph nodes, urine, feces, hay, nasal secretions.

- Palmer, M.V.; Whipple, D.L.; Waters, W.R. **Tuberculin skin testing in white-tailed deer (*Odocoileus virginianus*)**. *Journal of Veterinary Diagnostic Investigation*. 2001. 13 (6) 530-533. ISSN: 1040-6387  
**NAL call number:** SF774 J68  
**Descriptors:** cervical skin test, diagnosis of infection, tuberculin, white-tailed deer, *Mycobacterium bovis*, *Odocoileus virginianus*, skin thickness, antemortem diagnosis.
- Perez, J.; Calzada, J.; Leon-Vizcaino, L.; Cubero, M.J.; Velarde, J.; Mozos, E. **Tuberculosis in an Iberian lynx (*Lynx pardina*)**. *Veterinary Record*. Mar 31, 2001. 148 (13) 414-415. ISSN: 0042-4900  
**NAL call number:** 41.8 V641  
**Descriptors:** *Iberian lynx*, *Mycobacterium bovis*, tuberculosis, histopathology, lesions, postmortem examinations, case reports, Spain.
- Smith, G.C.; Cheeseman, C.L.; Clifton-Hadley, R.S.; Wilkinson, D. **A model of bovine tuberculosis in the badger *Meles meles*: an evaluation of control strategies**. *Journal of Applied Ecology*. June 2001. 38 (3) 509-519. ISSN: 0021-8901  
**NAL call number:** 410 J828  
**Descriptors:** tuberculosis, *Mycobacterium bovis*, cattle, badgers, *Meles meles*, disease control, methods, simulation models, epidemiology, disease prevalence.
- Smith, G.C.; Cheeseman, C.L.; Wilkinson, D.; Clifton Hadley, R.S. **A model of bovine tuberculosis in the badger *Meles meles*: the inclusion of cattle and the use of a live test**. *Journal of Applied Ecology*. June 2001. 38 (3) 520-535. ISSN: 0021-8901  
**NAL call number:** 410 J828  
**Descriptors:** tuberculosis, *Mycobacterium bovis*, cattle, badgers, *Meles meles*, infection, disease control, disease transmission, culling, ELISA, stochastic models, simulation models, population dynamics, epidemiology, vectorial capacity, disease prevalence, England.
- Smith, G.C.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Models of *Mycobacterium bovis* in wildlife and cattle. Tuberculosis**. 2001. 81 (1-2) 51-64. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.  
**Descriptors:** badgers, cattle, deer, Didelphidae, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, disease control, disease models, reviews, simulation models, wild animals, small mammals.
- Southey, A.; Sleeman, D.P.S.; Lloyd, K.; Dalley, D.; Chambers, M.A.; Hewinson, R.G.; Gormley, E. **Immunological responses of Eurasian badgers (*Meles meles*) vaccinated with *Mycobacterium bovis* BCG (bacillus Calmette Guerin)**. *Veterinary Immunology and Immunopathology*. 2001. 79 (3-4) 197-207. ISSN: 0165-2427  
**NAL call number:** SF757.2.V38  
**Descriptors:** antibodies, antigens, immune response, immunity, lymphocyte transformation, T lymphocytes, vaccination, *Meles meles*, *Mycobacterium bovis* BCG strain.
- Southey, A.K.; Sleeman, D.P.; Prendergast, J.; O'Sullivan, R.F.; Mulcahy, M.F. **Use of biomarkers to assess the feasibility of delivering a vaccine to badgers (*Meles meles*)**. *Journal of Zoology*. 2001. 253 (1) 133-139.  
**NAL call number:** 450 J829  
**Descriptors:** controlled study, effective biomarkers, iophenoxic, tetracycline, bait uptake study, free-living badgers, canine teeth sectioning, method to track vaccine uptake, *Mycobacterium*, tuberculosis control.
- Skinner, M.A.; Wedlock, D.N.; Buddle, B.M. **Vaccination of animals against *Mycobacterium bovis***. *Revue Scientifique et Technique Office International des Epizooties*. 2001. 20 (1) 112-132. Note: In English with French and Spanish summaries.  
**NAL call number:** SF781 R4  
**Descriptors:** disease control, immune response, immunology, recombinant vaccines, tuberculosis, vaccination, wildlife, cattle, deer, *Mycobacterium bovis*.

## 2000

Arora, B.M.; Verma, R. (ed.); Sharma, N. (ed.); Varma, T.K. (ed.); Bagherwal, R.K. (ed.); Jaiswal, T.N. **Tuberculosis**

**in wild mammals in India.** *Advancements in Veterinary Science*. p. 92-105. Note: Indian Veterinary Congress, Izatnagar, India, 18-19 February 2000.

**Descriptors:** wild animals, mammals, tuberculosis, *Mycobacterium bovis*, diagnosis, epidemiology, disease prevention, treatment, case reports, disease control, India.

Bengis, R.G.; Keet, D.F. **Bovine tuberculosis in the Kruger National Park.** *Proceedings of the North American Veterinary Conference*. [Gainesville, Fla.]. Eastern States Veterinary Association. 2000. v. 14 p. 1034-1036. Note: Meeting held on January 15-19, 2000. Orlando, Florida.

**NAL call number:** SF605.N672

**Descriptors:** Bovidae, *Papio ursinus*, Felidae, *Mycobacterium bovis*, clinical aspects, epidemiology, South Africa.

Bhowmik, M.K. **Disease spectrum and fawn mortality of hog deer (*Axis porcinus*) in Eastern Himalayan region.** *Tigerpaper*. 2000. 27 (4) 17-20.

**NAL call number:** QL84.5 A1T53

**Descriptors:** diseases, hog deer, *Axis porcinus*, action plan for species, postmortem screening data, tuberculosis, pneumonia, colibacillosis, parasitic diseases, stillbirths, injuries.

Blancou, J; Blancou, J. *Histoire de la surveillance et du controle des maladies animals transmissibles. [History of the monitoring and the control of transmissible animal diseases.]* Office International des Epizooties; Paris; France. 2000. xiv + 366 pp. Note: In French.

**Descriptors:** history, symptoms, lesions, etiology, pathology, epidemiology, preventive measures, treatment, legislative aspects of transmissible animal diseases, sheep pox, foot and mouth disease, anthrax, distemper, glanders, contagious pleuropneumonia, rinderpest, African horse sickness, rabies, tuberculosis, tetanus, cysticercosis, dourine, fascioliasis, mange and scabies, endoparasites, cattle, dogs, goat, horse, sheep, swine, wild animals.

Bollo, E.; Ferroglia, E.; Dini, V.; Mignone, W.; Biolatti, B.; Rossi, L. **Detection of *Mycobacterium tuberculosis* complex in lymph nodes of wild boar (*Sus scrofa*) by a target-amplified test system.** *Journal of Veterinary Medicine, Series B*. June 2000. 47 (5) 337-342. ISSN: 0931-1793

**NAL call number:** 41.8 Z52

**Descriptors:** wild pigs, *Sus scrofa*, *Mycobacterium tuberculosis*, detection, lymph nodes, histology, lesions, clinical aspects, histopathology, necrosis, ribosomal RNA.

Briones, V.; de Juan, L.; Sanchez, C.; Vela, A.I.; Galka, M.; Montero, N.; Goyache, J.; Aranaz, A.; Mateos, A.; Dominguez, L. **Bovine tuberculosis and the endangered Iberian lynx.** *Emerging Infectious Diseases*. 2000. 6 (2) 189-191.

**NAL call number:** RA648.5 E46

**Descriptors:** *Lynx lynx*, *Mycobacterium bovis*, epidemiology, tuberculosis, endangered species, case reports, wild animals, Spain.

Buddle, B.M.; Skinner, M.A.; Chambers, M.A. **Immunological approaches to the control of tuberculosis in wildlife reservoirs.** *Veterinary Immunology and Immunopathology*. Apr 19, 2000. 74 (1/2) 1-16. ISSN: 0165-2427

**NAL call number:** SF757.2.V38

**Descriptors:** *Mycobacterium bovis*, wildlife, disease reservoir hosts, wildlife management, infections, vaccines, biological control, diagnosis, disease transmission, serology, vaccination, literature reviews, New Zealand.

Buddle, B.M.; Young, L.J.; Deane, E.M. (ed.); Miller, R.D. **Immunobiology of mycobacterial infections in marsupials.** *Developmental and Comparative Immunology. Special issue: Marsupial Immunology*. 2000. 24 (5) 517-529.

**NAL call number:** QR180 D4

**Descriptors:** marsupials, mycobacterial infection, brushtail possum, *Trichosurus vulpecula*, disease reservoirs, *Mycobacterium bovis*, *Mycobacterium avium*, danger to captive marsupials, cellular immunity, disease process, immunity deficiencies, vaccine, New Zealand.

Chambers, M.A.; Gavier-Widen, D.; Stanley, P.A.; Hewinson, R.G. **Biochemical and haematological parameters associated with tuberculosis in European badgers.** *Veterinary Record*. June 17, 2000. 146 (25) 734-735. ISSN: 0042-4900

**NAL call number:** 41.8 V641

**Descriptors:** badgers, *Meles meles*, tuberculosis, *Mycobacterium bovis*, blood chemistry, hematology.

Clark, T.W. **Wildlife resources: the elk of Jackson Hole, Wyoming.** *Bulletin Series. Yale School of Forestry and Environmental Studies.* 2000. No. 104, 171-187.

**NAL call number:** 99.9 Y1B

**Descriptors:** animal diseases, biodiversity, centralization, community involvement, costs, decision making, ecological disturbance, environmental degradation, habitats, plant communities, supplementary feeding, wildlife management, tuberculosis valuation, wildlife conservation, brucellosis, *Cervus elephas*, American elk, waipiti, Wyoming.

Cooke, M.M. **Tuberculous sialoadenitis in a badger.** *New Zealand Veterinary Journal.* 2000. 48 (4) 122.

**NAL call number:** 41.8 N483

**Descriptors:** tuberculosis, *Mycobacterium bovis*, case reports, reservoir hosts, wild animals, salivary glands, salivary gland diseases, badgers, New Zealand.

Corner, L.A.; Lugton, I.; Collins, D.M.; Morris, R.S. **Use of molecular epidemiology of *Mycobacterium bovis* to study reemergence of tuberculosis in a wild brushtail possum population.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 253

**Descriptors:** cattle pathogen, bovine tuberculosis, *Mycobacterium bovis*, pathogen levels, brushtail possum (*Trichosurus vulpecula*).

Corner, L.A.; Buddle, B.M.; Lisle, G.W. de; Norton, S.; Morris, R.S. **BCG aerosol vaccination of brushtail possums against *Mycobacterium bovis* infection in the wild.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11 2000.* 2000; Id 252

**Descriptors:** wild brushtail possums (*Trichosurus vulpecula*), disease control, *Mycobacterium bovis*, BCG, efficacy, vaccination by aerosol, immune sensitization

Corner, L.A.; Pfeiffer, D.U.; Morris, R.S. **Use of social network analysis to study *Mycobacterium bovis* infection of captive brushtail possums.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 244.

**Descriptors:** captive brushtail possums (*Trichosurus vulpecula*), *Mycobacterium bovis*, animal behavior, bacterial infections, wildlife disease vectors and reservoirs, bacterioses, behaviors.

Cross, M.L.; Labes, R.E.; Mackintosh, C.G. **Oral infection of ferrets with virulent *Mycobacterium bovis* or *Mycobacterium avium*: susceptibility, pathogenesis and immune response.** *Journal of Comparative Pathology.* 2000. 123 (1) 15-21.

**NAL call number:** 41.8 J82

**Descriptors:** ferrets, immune response, pathogenesis, histopathology, mycobacterial diseases, tuberculosis, reservoir hosts, susceptibility, *Mycobacterium avium*, *Mycobacterium bovis*.

Cross, M.L.; Labes, R.E.; Griffin, J.F.T.; Mackintosh, C.G. **Systemic but not intra-intestinal vaccination with BCG reduces the severity of tuberculosis infection in ferrets (*Mustela furo*).** *International Journal of Tuberculosis and Lung Disease.* 2000. 4 (5) 473-480. Note in English with French and Spanish abstracts.

**Descriptors:** ferrets, disease reservoirs and vectors, tuberculosis, BCG vaccine, vaccination, experimental infections, bacterial diseases, transmission control, experimental infection, *Mycobacterium bovis* BCG strain, *Mycobacterium bovis*, New Zealand.

Day, T.D.; O'Connor, C.E. **Behavioural adaptation of brushtail possums (*Trichosurus vulpecula*) to captivity.** *Animal Welfare.* 2000. 9 (4) 413-420.

**NAL call number:** HV4701 A557

**Descriptors:** wild animal disease reservoir, tuberculosis, brushtail possum, *Trichosurus vulpecula* research animal, behavior in captive situation, individual caged, adaption time.

Delahay, R.J.; Langton, S.; Smith, G.C.; Clifton-Hadley, R.S.; Cheeseman, C.L. **The spatio-temporal distribution of**

***Mycobacterium bovis* (bovine tuberculosis) infection in a high-density badger population.** *Journal of Animal Ecology*. 2000. 69 (3) 428-441.

**NAL call number:** 410 J826

**Descriptors:** European badger, *Meles meles*, disease reservoir, *Mycobacterium bovis*, cattle, Britain, Ireland, spatio-temporal distribution and variation, epidemiology, ecology, wild population density, disease prevalence, gender differences, persistence.

Eves, J. **Le blaireau et la tuberculose bovine. [Badgers and bovine tuberculosis.]** *Epidemiologie et Sante Animale*. No. 37, 45-50. Note: Association pour l'Etude de l'Epidemiologie des Maladies Animales meeting, 18 May 2000: Epidemiology and Wildlife in Europe. In French with an English summary.

**Descriptors:** cattle, disease transmission, reservoir hosts, *Mycobacterium bovis*, tuberculosis, wild animals, badgers, *Meles meles*, Irish Republic.

Fann, C.S.; Mitchell, R.R.; Berry, D.E.; Payeur, J.B. **Comparison of postmortem techniques for the detection of *Mycobacterium bovis* in white-tailed deer (*Odocoileus virginianus*).** *Journal of Veterinary Diagnostic Investigation*. 2000. 12 (4) 322-327. ISSN: 1040-6387

**NAL call number:** SF774 J68

**Descriptors:** surveillance program, *Mycobacterium bovis*, deer, histopathology, acid-fast bacilli, group specific probe, specificity, predictive value, comparison for sensitivity, wild animal testing, Michigan.

Frank, J.; Griffin, T. **Veterinary tuberculosis vaccine development.** *Clinical Infectious Diseases*. 2000. 30 (Supp 3) S223-S228.

**NAL call number:** RC111 R4

**Descriptors:** tuberculosis, vaccines, wild animals, disease control, *Mycobacterium bovis* BCG strain, *Mycobacterium bovis*.

Gallagher, J.; Clifton-Hadley, R.S. **Tuberculosis in badgers; a review of the disease and its significance for other animals.** *Research in Veterinary Science*. Dec 2000. 69 (3) 203-217. ISSN: 0034-5288

**NAL call number:** 41.8 R312

**Descriptors:** *Meles meles*, tuberculosis, *Mycobacterium bovis*, pathology, pathogenesis, immunity diagnosis, excretion, epidemiology, wild animals, domestic animals, disease transmission, control methods, literature reviews.

Good, M.; O'Boyle, I. **Results of post mortem examination of badgers in Ireland for evidence of *Mycobacterium bovis*.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000*. 2000: Id 167.

**Descriptors:** badgers (*Meles meles*), *Mycobacterium bovis*, intradermal tests, post mortem exams, Ireland.

Gormley, E.; Collins, J.D. **The development of wildlife control strategies for eradication of tuberculosis in cattle in Ireland.** *Tubercle and Lung Disease*. 2000. 80 (4-5) 229-236.

**Descriptors:** disease reservoirs, badgers, *Mycobacterium bovis*, cattle, disease transmission, epidemiology, protected wildlife species, disease control and eradication, vaccination programs, Irish Republic.

Griffin, J.M.; Quigley, F.; Towey, K.P.; Costello, E.; Hammond, R.F.; McGrath, G.; Sleeman, D.P.; Collins, J.D. **A field trial to assess the impact of badger removal on tuberculosis levels in cattle in four geographical areas in Ireland.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000*. 2000: Id 184

**Descriptors:** badgers, cattle, bovine tuberculosis, *Mycobacterium bovis*, autopsy, control programs, disease surveillance, postmortem inspections, Ireland.

Griffin, J.F.T.; Mackintosh, C.G. **Tuberculosis in deer: perceptions, problems and progress.** *Veterinary Journal*. Nov 2000. 160 (3) 202-219. ISSN: 1090-0233

**URL:** <http://intl.elsevierhealth.com/journals/tvjl/>

**NAL call number:** SF601.V484

**Descriptors:** deer tuberculosis, *Mycobacterium bovis*, disease control, incidence, disease transmission, diagnosis, skin tests, blood, laboratory tests, strains, deer farming, vaccination, disease models, heritability, disease resistance,

literature reviews.

Hammond, R.F. **Visualisation of the temporal and spatial patterns of tuberculin reactor disclosure in an area affected by the removal of badgers.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 183

**Descriptors:** cattle, badgers (*Meles meles*), wild animal disease reservoir, *Mycobacterium bovis*, disease control programs, post mortem inspections, Ireland.

Keet, D.F.; Kriek, N.P.J.; Bengis, R.G.; Grobler, D.G.; Michel, A. **The rise and fall of tuberculosis in a free-ranging chacma baboon troop in the Kruger National Park.** *Onderstepoort Journal of Veterinary Research.* 2000. 67 (2) 115-122.

**NAL call number:** 41.8 On1

**Descriptors:** free ranging chacma baboons, *Papio ursinus*, *Mycobacterium bovis*, feeding on infected animal remains, RFLP analysis, African buffalo, *Syncerus caffer*, apparent disease sources, behavior, infected sleeping places, transmission.

Machackova, M.; Lamka, J.; Docekal, J.; Smolik, J.; Ziegrosser, P.; Pavlik, I. **Bovinni tuberkuloza u sparkate zvere. [Bovine tuberculosis in hoofed game animals.]** *Veterinarstvi.* 2000. 50 (9) 349-355. Note: In Czech with an English summary.

**NAL call number:** 41.8 V6439

**Descriptors:** tuberculosis, deer, game animals, diagnosis, reviews, Czech Republic.

McKenzie, J.S.; Pfeiffer, D.U.; Morris, R.S. **Spatial and temporal patterns of vector-borne tuberculosis infection in beef breeding cattle in New Zealand.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 574.

**Descriptors:** beef cattle, *Mycobacterium bovis*, brushtailed possum, *Trichosurus vulpecula*, New Zealand.

McKenzie, J.S.; Pfeiffer, D.U.; Morris, R.S. **Application of habitat analysis and spatial analytical techniques to statistical modelling of possum-associated tb risk on farms.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11 2000.* 2000: Id 575.

**Descriptors:** cattle, *Mycobacterium bovis*; brushtailed possums (*Trichosurus vulpecula*) habitat analysis, spatial analytical methods, GIS, New Zealand.

Michel, A.L.; Mare, L. **The molecular epidemiology of *Mycobacterium bovis* infection in the Kruger National Park, South Africa.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11 2000.* 2000: Id 643.

**Descriptors:** *Acinonyx jubatus*, cattle, leopards, lions, disease surveillance, RFLP, *Mycobacterium bovis*, *Papio ursinus*, *Syncerus caffer*, *Tragelaphus strepsiceros*, South Africa.

Munroe, F.A.; Dohoo, I.R.; McNab, W.B. **Estimates of within-herd incidence rates of *Mycobacterium bovis* in Canadian cattle and cervids between 1985 and 1994.** *Preventive Veterinary Medicine.* 2000. 45 (3-4) 247-256.

**NAL call number:** SF601 P7

**Descriptors:** beef and dairy cattle, deer, cervids, *Mycobacterium bovis*, within-herd incidence of disease, disease transmission, risk factors, tuberculosis, outbreaks, herds, bacterial diseases.

Norden, D.K.; Meyer, R.M.; Salman, M.D. **Evaluation of tuberculin tests in U.S. captive reindeer (*Rangifer tarandus*)-1991-1999.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 394.

**Descriptors:** captive reindeer, tuberculin testing for *Mycobacterium*, USA.

Palmer, M.V.; Whipple, D.L.; Payeur, J.B.; Alt, D.P.; Esch, K.J.; Bruning-Fann, C.S.; Kaneene, J.B. **Naturally occurring tuberculosis in white-tailed deer.** *Journal of the American Veterinary Medical Association.* June 15, 2000. 216 (12) 1921-1924. ISSN: 0003-1488

**NAL call number:** 41.8 AM3

**Descriptors:** white-tailed deer, *Odocoileus virginianus*, tuberculosis, *Mycobacterium bovis*, lesions, postmortem examinations, animal tissues, disease prevalence, age and sex differences, Michigan.

Qureshi, T.; Labes, R.E.; Lambeth, M.; Montgomery, H.; Griffin, J.F.T.; Mackintosh, C.G. **Transmission of *Mycobacterium bovis* from experimentally infected ferrets to non-infected ferrets (*Mustela furo*)**. *New Zealand Veterinary Journal*. 2000. 48 (4) 99-104.

**NAL call number:** 41.8 N483

**Descriptors:** ferrets, experimental infections, *Mycobacterium bovis*, disease transmission study, behavior, den sharing, sniffing of orifices and feces, cannibalism, aggressive breeding behavior.

Ragg, J.R.; Mackintosh, C.G.; Moller, H. **The scavenging behaviour of ferrets (*Mustela furo*), feral cats (*Felis domesticus*), possums (*Trichosurus vulpecula*), hedgehogs (*Erinaceus europaeus*) and harrier hawks (*Circus approximans*) on pastoral farmland in New Zealand: implications for bovine tuberculosis transmission**. *New Zealand Veterinary Journal*. 2000. 48 (6) 166-175.

**NAL call number:** 41.8 N483

**Descriptors:** ferrets, feral cats, possums, hedgehogs, harrier hawks, time lapse video, carrion feeding behavior on carcasses, communal feeding behavior, impact on tuberculosis transmission, cattle diseases, *Mycobacterium*, New Zealand.

Salt, S.; Ozbilgin, S.; Ozmen, O.; Misirlioglu, D. **Bazi yabani ve kafes kuslarinda gozlenen klinik ve patolojik bulgular. [Clinical and pathological findings of some wild and captive birds.]** *Veteriner Fakultesi Dergisi*. 2000. 19 (1-2) 127-132. Note: In Turkish with an English summary.

**NAL call number:** SF1 I78

**Descriptors:** bird diseases, turkeys, budgerigars, pigeons, parrots, canaries, seagull, heron, peacock, various pathologies including tuberculosis, cysts pathological, encephalitis, enteritis, hemorrhage, hepatitis, hyperkeratosis, mycoses, neoplasms, pneumonia, tuberculosis, *Mycobacterium*.

Tuytens, F.A.M.; MacDonald, D.W.; Rogers, L.M.; Cheeseman, C.L.; Roddam, A.W. **Comparative study on the consequences of culling badgers (*Meles meles*) on biometrics, population dynamics and movement**. *Journal of Animal Ecology*. 2000. 69 (4) 567-580.

**NAL call number:** 410 J826

**Descriptors:** badgers, *Meles meles*, culling diseased animals, badger removal, population dynamics, gender differences, mortality, tuberculosis, wild animals as disease reservoirs, disease control measures, cattle diseases, UK.

Tuytens, F.A.M.; Delahay, R.J.; MacDonald, D.W.; Cheeseman, C.L.; Long, B.; Donnelly, C.A. **Spatial perturbation caused by a badger (*Meles meles*) culling operation: implications for the function of territoriality and the control of bovine tuberculosis (*Mycobacterium bovis*)**. *Journal of Animal Ecology*. 2000. 69 (5) 815-828.

**NAL call number:** 410 J826

**Descriptors:** wild badger culling, tuberculosis control measure, disease transmission and control, animal disease reservoirs, spatial distribution, disease vectors, cattle, *Meles meles*, *Mycobacterium bovis*, UK.

White, P.C.L.; Whiting, S.J. **Public attitudes towards badger culling to control bovine tuberculosis in cattle**. *Veterinary Record*. Aug 12, 2000. 147 (7) 179-184. ISSN: 0042-4900

**NAL call number:** 41.8 V641

**Descriptors:** badgers, *Meles meles*, culling, attitudes, public opinion, cattle, tuberculosis, disease control, England.

Wilkinson, D.; Smith, G.C.; Delahay, R.J.; Rogers, L.M.; Cheeseman, C.L.; Clifton-Hadley, R.S. **The effects of bovine tuberculosis (*Mycobacterium bovis*) on mortality in a badger (*Meles meles*) population in England**. *Journal of Zoology*. 2000. 250 (3) 389-395. ISSN: 0022-0477

**NAL call number:** 450 J829

**Descriptors:** mortality rates, badgers, long-term (1981-94) capture-mark-recapture study, undisturbed badger population, *Mycobacterium bovis*, infection, gender differences, transmission factors, England.

## 1999

Anonmyous. **Northeast Michigan surveillance activities for bovine tuberculosis in the livestock and free-ranging**

**deer populations. Update: September 15, 1998.** *Dairy, Food and Environmental Sanitation.* 1999. 19 (1) 35-38.  
**NAL call number:** SF221 D342

**Descriptors:** cattle, deer, *Mycobacterium bovis*, *Procyon lotor*; *Odocoileus virginianus*, tuberculosis, livestock, wild animals, disease control, disease prevalence, Michigan.

Anononyous. **TB and the short term.** *Veterinary Record.* Mar 20, 1999. 144 (12) 301. ISSN: 0042-4900  
**NAL call number:** 41.8 V641

**Descriptors:** cattle, badgers, *Meles meles*, tuberculosis, disease control, *Mycobacterium bovis*, Great Britain.

Bengis, R.G.; Fowler, M.E. (ed.); Miller, R.E. **Tuberculosis in free-ranging mammals.** *Zoo and Wild Animal Medicine: Current Therapy 4.* W.B. Saunders, Philadelphia, USA. 1999. Ed. 4, p. 101-114.

**NAL call number:** SF996 Z66 1999

**Descriptors:** wild animals, cattle, *Mycobacterium bovis*, tuberculosis, disease transmission, clinical aspects, pathology, diagnosis, disease control, treatment, vaccination.

Bhat, M.N.; Manickam, R.; Ramkrishna, J. **Screening of captive wild animals for tuberculosis.** *Indian Veterinary Journal.* 1999. 76 (11) 959-961.

**NAL call number:** 41.8 IN2

**Descriptors:** elephants, spotted deer, blackbuck, langurs, reliability of test diagnostic tests, tuberculin test, passive hemagglutination test (PHA), wild animals, zoo animals, delayed type hypersensitivity, *Elephas maximus*, antelopes, *Cervus axis*, *Antilope cervicapra*, India.

Black, H.; Simper, J.M.; Bloom, D.; Bloom, K. **A behaviour study on the potential for direct transmission of tuberculosis from possums (*Trichosura vulpecula*) to alpacas (*Lama pacos*), and the converse from alpacas to possums.** *New Zealand Veterinary Journal.* 1999. 47 (6) 204-206.

**NAL call number:** 41.8 N483

**Descriptors:** alpaca farm, tuberculosis, *Mycobacterium*, behavior study, impacts on disease transmission, interactions with brushtailed possums, possible aerosol transmission, stamping behavior, nose to nose contact, New Zealand.

Caley, P.; Hickling, G.J.; Cowan, P.E.; Pfeiffer, D.U. **Effects of sustained control of brushtail possums on levels of *Mycobacterium bovis* infection in cattle and brushtail possum populations from Hohotaka, New Zealand.** *New Zealand Veterinary Journal.* 1999. 47 (4) 133-142.

**NAL call number:** 41.8 N483

**Descriptors:** cattle, brushtail possum, wildlife disease reservoir, population density, tuberculosis, *Mycobacterium bovis*, pest control, disease prevalence, disease transmission, epidemiology, *Trichosurus vulpecula*, pest population levels and control, New Zealand.

Coleman, J.D.; Thomas, M.D.; Pracy, L.T.; Hansen, Q. **Fluctuations in possum numbers in the Pararaki Valley, Haurangi State Forest Park.** *Science for Conservation.* Department of Conservation; Wellington; New Zealand. 1999. No. 128, 16 pp.

**Descriptors:** brushtail possums, forests, colonization, trapping, pests, introduced species, wild animals, vertebrate pests, forest pests, nature conservation, livestock animal diseases, tuberculosis, population dynamics, national parks, reservoir hosts, *Trichosurus vulpecula*, New Zealand.

Coleman, J.D.; Cooke, M.M.; Jackson, R.; Webster, R. **Temporal patterns in bovine tuberculosis in a brushtail possum population contiguous with infected cattle in the Ahaura Valley, Westland.** *New Zealand Veterinary Journal.* 1999. 47 (4) 119-124.

**NAL call number:** 41.8 N483

**Descriptors:** brushtail possum, *Trichosurus vulpecula*, temporal and spatial patterns, contiguously with livestock, disease transmission trapping study, New Zealand, tubercular lesions, wildlife disease reservoirs, population size related to incidence of disease.

Cook, R.A.; Fowler, M.E. (ed.); Miller, R.E. ***Mycobacterium bovis* infection of cervids: diagnosis, treatment, and control.** *Zoo and Wild Animal Medicine: Current Therapy 4.* Philadelphia, W.B. Saunders. 1999. Ed. 4, p. 650-657.

**NAL call number:** SF996 Z66 1999

**Descriptors:** wild animals, zoo animals, *Mycobacterium bovis*, tuberculosis, diagnosis, treatment, disease control,

zoonoses.

Cross, M.L.; Swale, E.; Young, G.; Mackintosh, C. **Effect of field capture on the measurement of cellular immune responses in wild ferrets (*Mustela furo*), vectors of bovine tuberculosis in New Zealand.** *Veterinary Research*. 1999. 30 (4) 401-410. Note: In English with a French summary.

**NAL call number:** SF602 A5

**Descriptors:** ferrets, tuberculosis, cell mediated immunity, immune response wild animals as disease vectors, in vitro lymphocyte reactivity, levels of stress, comparison between wild-caught and lab animals, serum cortisol and glucose levels, postmortem examinations, hydrocortisone, lymphocyte transformation, mitogens, T lymphocytes, wire frame traps, soft-jawed leg hold traps, uridine, vaccines, capture of animals.

Dalley, D.; Chambers, M.A.; Cockle, P.; Pressling, W.; Gavier-Widen, D.; Hewinson, R.G. **A lymphocyte transformation assay for the detection of *Mycobacterium bovis* infection in the Eurasian badger (*Meles meles*).** *Veterinary Immunology and Immunopathology*. 1999. 70 (1-2) 85-94. ISSN: 0165-2427

**NAL call number:** SF757.2.V38

**Descriptors:** badgers, *Meles meles*, comparative lymphocyte transformation assay, cell mediated immunity, laboratory diagnostic tests, ELISA assay, tuberculin, *Mycobacterium bovis*, tuberculosis, vaccines, wildlife, bacterial diseases, UK.

Eves, J.A. **Impact of badger removal on bovine tuberculosis in east County Offaly.** *Irish Veterinary Journal*. 1999. 52 (4) 199-203.

**NAL call number:** 41.8 IR4

**Descriptors:** *Mycobacterium bovis*, cattle, badgers, tuberculosis, disease transmission, wildlife disease reservoirs, disease control measures, disease prevalence, Irish Republic.

Feore, S.; Montgomery, W.I. **Habitat effects on the spatial ecology of the European badger (*Meles meles*).** *Journal of Zoology*. 1999. 247 (4) 537-549.

**NAL call number:** 450 J829

**Descriptors:** badgers, wildlife disease reservoirs, spatial ecology, moorlands, badger sett density, size of social groups, habitats, pastures, woodland, grasslands, *Mycobacterium tuberculosis*, epidemiology, *Meles meles*, Northern Ireland.

Gallagher, J. **Infected badgers; to control or not?** *Cattle Practice*. 1999. 7 (4) 373-374.

**NAL call number:** SF961 C37

**Descriptors:** badgers, infected wildlife, tuberculosis, cattle, disease control and transmission, *Mycobacterium bovis*, UK.

Hutchings, M.R.; Harris, S. **Quantifying the risks of TB infection to cattle posed by badger excreta.** *Epidemiology and Infection*. 1999. 122 (1) 167-174.

**NAL call number:** RA651 A1E74

**Descriptors:** cattle, wild badgers, *Meles meles*, deterministic approach, grazing contact with excreta, investigatory contact with excreta, muzzle to sward contact, infection probability, *Mycobacterium bovis*, England, transmission levels, risk assessment.

Kao, R.R.; Roberts, M.G. **A comparison of wildlife control and cattle vaccination as methods for the control of bovine tuberculosis.** *Epidemiology and Infection*. 1999. 122 (3) 505-519.

**NAL call number:** RA651 A1E74

**Descriptors:** *Mycobacterium bovis*, cattle, possums, *Trichosurus vulpecula*, cost of putative Tb, eradication, possum culling, vaccination of cattle or possums, compared, 1080 poison bait, wild animal disease reservoirs, epidemiology, mathematical models, New Zealand.

Kean, J.M.; Barlow, N.D.; Hickling, G.J. **Evaluating potential sources of bovine tuberculosis infection in a New Zealand cattle herd.** *New Zealand Journal of Agricultural Research*. 1999. 42 (1) 101-106.

**NAL call number:** 23 N4892

**Descriptors:** cattle, disease control, epidemiology, *Mycobacterium bovis*, tuberculosis, disease transmission, wild animals as disease reservoirs, brushtail possum, *Trichosurus vulpecula*, New Zealand.

Mangold, B.J.; Cook, R.A.; Cranfield, M.R.; Huygen, K.; Godfrey, H.P. **Detection of elevated levels of circulating antigen 85 by dot immunobinding assay in captive wild animals with tuberculosis.** *Journal of Zoo and Wildlife Medicine*. 1999. 30 (4) 477-483.

**NAL call number:** SF601.J6

**Descriptors:** tuberculosis, *Mycobacterium bovis*, wild animals, diagnosis, immunoassay, assays, bacterial diseases, nyala, sable antelope, *Hippotragus niger*, eland, *Taurotragus oryx*, cape buffalo, *Syncerus caffer*, *Tragelaphus angasi*, dot immunobinding, greater kudu, *Taurotragus strepsiceros*, sitatunga, *Taurotragus spekii*.

Montgomery, R.H. **Mycobacteria in New Zealand.** *Surveillance*. 1999. 26 (1) 6-8; 18.

**NAL call number:** SF604.63 N45S87

**Descriptors:** birds, possums, dogs, cats, rabbits, pigs, sheep, goats, deer, cattle, humans, *Mycobacterium* taxonomy, diagnosis, disease transmission, disease prevalence, disease control, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, Erinaceidae, *Mustela erminea*, *Mycobacterium avium*, *Mycobacterium paratuberculosis*, *Mycobacterium lepraemurium*, *Mycobacterium marinum*, *Mycobacterium kansasii*, New Zealand.

Munroe, F.A.; Dohoo, I.R.; McNab, W.B.; Spangler, L. **Risk factors for the between-herd spread of *Mycobacterium bovis* in Canadian cattle and cervids between 1985 and 1994.** *Preventive Veterinary Medicine*. 1999. 41 (2-3) 119-133.

**NAL call number:** SF601 P7

**Descriptors:** cattle, cervids, tuberculosis outbreaks, *Mycobacterium bovis*, positive or negative herd analysis, outbreak records, logistic regression, spread of tuberculosis between herds, herd size, disease transmission, statistical analysis, Canada.

Nation, P.N. **Problems associated with the depopulation of tuberculosis-infected wapiti herds.** *Canadian Veterinary Journal*. Feb 1999. 40 (2) 88. ISSN: 0008-5286

**NAL call number:** 41.8 R3224

**Descriptors:** *Cervus elaphus canadensis*, elk, *Mycobacterium bovis*, Alberta, Canada.

Nicoletti, P. **Brucellosis and tuberculosis in free-ranging bison, deer and elk.** *Proceedings of the North American Veterinary Conference*. 1999. 13: 862-863. Note: Meeting held on Jan. 9-13, 1999, Orlando, Florida.

**NAL call number:** SF605.N672

**Descriptors:** bison, deer, elk, *Cervus elaphus canadensis*, *Brucella*, *Mycobacterium bovis*, disease prevalence.

Palmer, M.V.; Whipple, D.L.; Olsen, S.C. **Development of a model of natural infection with *Mycobacterium bovis* in white-tailed deer.** *Journal of Wildlife Diseases*. 1999. 35 (3) 450-457. ISSN: 0090-3558

**NAL call number:** 41.9 W64B

**Descriptors:** experimental infection white-tailed deer, *Odocoileus virginianus*, intra-tonsillar injection, *Mybacterium bovis*, low and high doses, lesions in various organs, a disease model for naturally occurring infections, infected saliva and nasal secretions, pathology.

Powlesland, R.G.; Knegtmans, J.W.; Marshall, I.S.J. **Costs and benefits of aerial 1080 possum control operations using carrot baits to North Island robins (*Petroica australis longipes*), Pureora Forest Park.** *New Zealand Journal of Ecology*. 1999. 23 (2) 149-159. Note: *Proceedings of a meeting of the New Zealand Ecological Society on Ecological Consequences of Poisons Used for Mammalian Pest Control, Christchurch, New Zealand, 9-10 July 1998.*

**NAL call number:** QH540 N43

**Descriptors:** control measures, 1080 carrot baits, brushtail possums, *Trichosurus vulpecula* populations, non-target bird mortality, survey of impact on robin populations, pest control, sodium-fluoroacetate, rats.

Qureshi, T.; Labes, R.E.; Cross, M.L.; Griffin, J.F.T.; Mackintosh, C.G. **Partial protection against oral challenge with *Mycobacterium bovis* in ferrets (*Mustela furo*) following oral vaccination with BCG.** *International Journal of Tuberculosis and Lung Disease*. 1999. 3 (11) 1025-1033. Note: In English with Spanish and French summaries.

**Descriptors:** *Mycobacterium bovis* BCG, ferrets, wildlife disease reservoirs, vaccinated oral delivery, oral challenge with virulent *Mycobacterium bovis*, effectiveness of vaccination, immune response, lymph system, partial protection, experimental infection.

Rogers, L.M.; Delahay, R.J.; Cheeseman, C.L.; Smith, G.C.; Clifton-Hadley, R.S. **The increase in badger (*Meles***

**meles**) density at Woodchester Park, south-west England: a review of the implications for disease (*Mycobacterium bovis*) prevalence. *Mammalia*. 1999. 63 (2) 183-192. Note: In English with a French summary.  
NAL call number: 410 M31

**Descriptors:** ecology, wild animals, intermediate hosts, disease reservoirs, disease prevalence, tuberculosis, *Mycobacterium bovis*, badgers, cattle, England, UK.

Serraino, A.; Marchetti, G.; Sanguinetti, V.; Rossi, M.C.; Zanoni, R.G.; Catozzi, L.; Bandera, A.; Dini, W.; Mignone, W.; Franzetti, F. **Monitoring of transmission of tuberculosis between wild boars and cattle: genotypical analysis of strains by molecular epidemiology techniques.** *Journal of Clinical Microbiology*. Sept 1999. 37 (9) 2766-2771. ISSN: 0095-1137

NAL call number: QR46.J6

**Descriptors:** cattle, wild boars, *Mycobacterium bovis*, DNA fingerprinting, restriction fragment length polymorphism, RFLP, disease transmission, Liguria.

Steffen, D.J.; Oates, D.W.; Sterner, M.C.; Cooper, V.L. **Absence of tuberculosis in free-ranging deer in Nebraska.** *Journal of Wildlife Diseases*. Jan 1999. 35 (1) 105-107. ISSN: 0090-3558

NAL call number: 41.9 W64B

**Descriptors:** *Odocoileus virginianus*, *Odocoileus hemionus*, *Mycobacterium bovis*, disease prevalence. Nebraska.

Tuytens, F.A.M.; Macdonald, D.W.; Delahay, R.; Rogers, L.M.; Mallinson, P.J.; Donnelly, C.A.; Newman, C. **Differences in trappability of European badgers *Meles meles* in three populations in England.** *Journal of Applied Ecology*. 1999. 36 (6) 1051-1062.

NAL call number: 410 J828

**Descriptors:** *Meles meles*, badgers, epidemiology, trapping, *Mycobacterium bovis*, wildlife reservoirs, disease transmission, disease control, mark-release-recapture sampling, population ecology, factors affecting trappability, techniques, England, UK.

Woodroffe, R.; Frost, S.D.W.; Clifton-Hadley, R.S. **Attempts to control tuberculosis in cattle by removing infected badgers: constraints imposed by live test sensitivity.** *Journal of Applied Ecology*. 1999. 36 (4) 494-501.

NAL call number: 410 J828

**Descriptors:** cattle, *Mycobacterium bovis*, tuberculosis, culling badgers, *Meles meles*, disease transmission, wildlife disease reservoirs, disease control, serology, immunodiagnosis, wild animals, control, identifying infected animals for removal, UK.

## 1998

Anonymyous. **A challenging task on TB.** *Veterinary Record*. Mar 14, 1998. 142 (11) 257. ISSN: 0042-4900

NAL call number: 41.8 V641

**Descriptors:** tuberculosis, badgers, *Meles meles*, cattle, disease control.

Anonymyous. **No quick fix on TB.** *Veterinary Record*. Jan 3, 1998. 142 (1) 1. ISSN: 0042-4900

NAL call number: 41.8 V641

**Descriptors:** cattle, tuberculosis, *Mycobacterium bovis*, badgers, *Meles meles*, disease control, UK.

Bruning-Fann, C.S.; Schmitt, S.M.; Fitzgerald, S.D.; Payeur, J.B.; Whipple, D.L.; Cooley, T.M.; Carlson, T.; Friedrich, P. ***Mycobacterium bovis* in coyotes from Michigan.** *Journal of Wildlife Diseases*. July 1998. 34 (3) 632-636. ISSN: 0090-3558

NAL call number: 41.9 W64B

**Descriptors:** coyotes, white-tailed deer, tuberculosis, disease surveys, wild animals, bacterial diseases, *Canis latrans*, *Odocoileus virginianus*, opossum, *Didelphis virginiana*, raccoon, *Procyon lotor*, red fox, *Vulpes vulpes*, bobcat, *Felis rufus*, badger, *Taxidea taxus*, Michigan.

Caley, P.; Spencer, N.J.; Cole, R.A.; Efford, M.G. **The effect of manipulating population density on the probability of den-sharing among common brushtail possums, and the implications for transmission of bovine tuberculosis.** *Wildlife Research*. 1998. 25 (4) 383-392.

NAL call number: S960 W5

**Descriptors:** cattle, brushtail possums, *Trichosurus vulpecula*, population density, disease transmission, *Mycobacterium bovis*, tuberculosis, wild animals, populations, New Zealand.

Caley, P. **Broad-scale possum and ferret correlates of macroscopic *Mycobacterium bovis* infection in feral ferret populations.** *New Zealand Veterinary Journal*. 1998. 46 (4) 157-162.

**NAL call number:** 41.8 N483

**Descriptors:** wild animals, *Mustela furo*, ferrets, populations, disease prevalence and transmission, tuberculosis, surveys, bacterial diseases, *Trichosurus vulpecula*, *Mycobacterium bovis*, New Zealand.

Chaddock, H.M. **Northeast Michigan surveillance activities for bovine tuberculosis in the livestock and free-ranging deer populations.** *Proceedings One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October, 1998. United States Animal Health Association; Richmond; USA*. 1998. p. 660-686.

**NAL call number:** 49.9 UN3R

**Descriptors:** free-ranging deer, livestock, disease transmission, surveillance, tuberculosis, overcrowding effects, public health, food safety, wildlife as disease reservoirs, disease control, reviews, Michigan.

Cooke, M. **Infectious diseases of possums in New Zealand.** *Surveillance*. 1998. 25 (2) 10-12.

**NAL call number:** SF604.63 N45S87

**Descriptors:** infectious diseases, tuberculosis, protozoal infections, ectoparasites, bacterial diseases, parasitoses, fungal diseases, brushtail possum, wild animals, New Zealand.

Delahay, R.J.; Cheeseman, C.L.; Mallinson, P.J.; Rogers, L.M.; Smith, G.C. **Badgers and bovine tuberculosis: a review of studies in the ecology of a wildlife disease reservoir.** *Cattle Practice*. 1998. 6 (2) 83-87.

**NAL call number:** SF961 C37

**Descriptors:** *Mycobacterium bovis*, cattle, badgers, *Meles meles*, tuberculosis, wild animals as disease reservoirs, disease transmission, epidemiology.

Gallagher, J.; Monies, R.; Gavier-Widen, M.; Rule, B. **Role of infected, non-diseased badgers in the pathogenesis of tuberculosis in the badger.** *Veterinary Record*. June 27, 1998. 142 (26) 710-714. ISSN: 0042-4900

**NAL call number:** 41.8 V641

**Descriptors:** badgers, *Mycobacterium bovis*, *Meles meles*, tuberculosis, pathogenesis, lesions, lungs, kidneys, lymph nodes, histopathology.

Gripper, J. **An open letter to Nick Brown, Minister of Agriculture... [Tuberculosis in cattle and badgers in the UK].** *Veterinary Times*. 1998. 28 (10) 4-6.

**Descriptors:** cattle, badgers, *Meles meles*, *Mycobacterium*, tuberculosis, disease prevalence and control, disease transmission, wild animals, UK.

Helman, R.G.; Russell, W.C.; Jenny, A.; Miller, J.; Payeur, J. **Diagnosis of tuberculosis in two snow leopards using polymerase chain reaction.** *Journal of veterinary Diagnostic Investigation*. Jan 1998. 10 (1) 89-92. ISSN: 1040-6387

**NAL call number:** SF774 J68

**Descriptors:** *Panthera uncia*, tuberculosis, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium paratuberculosis*, *Mycobacterium tuberculosis*, diagnosis, polymerase chain reaction, diagnostic techniques, detection, identification, case reports, clinical aspects, symptoms, pathology, histopathology, *Mycobacterium africanum*, *Mycobacterium microti*.

Krebs, J.R.; Anderson, R.M.; Clutton-Brock, T.; Donnelly, C.A.; Frost, S.; Morrison, W.I.; Woodroffe, R.; Young, D. **Badgers and bovine TB: conflicts between conservation and health.** *Science*. Feb 6, 1998. 279 (5352) 817-818. ISSN: 0036-8075

**NAL call number:** 470 Sci2

**Descriptors:** cattle, Badgers, *Meles meles*, *Mycobacterium*, tuberculosis, disease transmission, male animals, disease control, Great Britain.

Krebs, J.R. **Bovine tuberculosis in cattle and badgers.** *State Veterinary Journal*. 1998. 8 (1) 1-3.

**NAL call number:** SF601 S8

**Descriptors:** cattle, *Mycobacterium bovis*, badgers, *Meles meles*, tuberculosis, UK.

Mairtin, D.O.; Williams, D.H.; Dolan, L.; Eves, J.A.; Collins, J.D. **The influence of selected herd factors and a badger-intervention tuberculosis-control programme on the risk of a herd-level trade restriction to a bovine population in Ireland.** *Preventive Veterinary Medicine*. 1998. 35 (2) 79-90.

**NAL call number:** SF601 P7

**Descriptors:** cattle, tuberculin skin test, post slaughter testing, disease risks, Cox proportional hazard model, herd-level trade restriction, badger control program, wild animal disease reservoir, *Mycobacterium bovis*, Ireland.

McCarty, C.W.; Miller, M.W. **A versatile model of disease transmission applied to forecasting bovine tuberculosis dynamics in white-tailed deer populations.** *Journal of Wildlife Diseases*. Oct 1998. 34 (4) 722-730. ISSN: 0090-3558

**NAL call number:** 41.9 W64B

**Descriptors:** white-tailed deer, *Odocoileus virginianus*, *Mycobacterium bovis*, disease prevalence, transmission factors, forecasting disease, epidemiology.

Mortimer, J.; Quackenbush, D.; Piller, A.; Thoen, C. **Veterinary students study tuberculosis at Kruger National Park, South Africa.** *Iowa State University Veterinarian*. Spring 1998. 60 (1) 18-22. ISSN: 0099-5851

**NAL call number:** 41.8 V6425

**Descriptors:** *Mycobacterium bovis*, disease transmission, *Papio*, epidemiology, wild animals, Kruger National Park, South Africa

Ragg, J.R. **Intraspecific and seasonal differences in the diet of feral ferrets (*Mustela furo*) in a pastoral habitat, East Otago, New Zealand.** *New Zealand Journal of Ecology*. 1998. 22 (2) 113-119.

**NAL call number:** QH540 N43

**Descriptors:** wild animals, rabbits, ferrets, prey species, age and sex differences in prey selections, disease transmission, *Mycobacterium bovis*, possums and hedgehogs probable disease reservoir, epidemiology, New Zealand.

Rogers, L.M.; Delahay, R.; Cheeseman, C.L.; Langton, S.; Smith, G.C.; Clifton-Hadley, R.S. **Movement of badgers (*Meles meles*) in a high-density population: individual, population and disease effects.** *Proceedings of the Royal Society of London. Series B, Biological Sciences*. 1998. 265 (1403) 1269-1276

**NAL call number:** 501 L84B

**Descriptors:** *Mycobacterium bovis*, tuberculosis, epidemiology, ecology, badger populations, *Meles meles*, UK.

Tuytens, F.A.M.; Macdonald, D.W. **Sterilization as an alternative strategy to control wildlife diseases: bovine tuberculosis in European badgers as a case study.** *Biodiversity and Conservation*. 1998. 7 (6) 705-723.

**NAL call number:** QH75 A1B562

**Descriptors:** *Mycobacterium*, free living badgers, *Meles meles*, cattle, case studies, tuberculosis, wildlife culling and sterilization, disease control, disease prevalence, disease transmission, epidemiology, feasibility studies, fertility models, population density, vertical disease transmission, vaccination, disease control, UK.

United States Animal Health Association. *Proceedings: One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October, 1998*. Richmond: The Association. 1998. 756 pp.

**NAL call number:** 49.9 UN3R

**Descriptors:** livestock, pigs, cattle, bison, horses, llamas, poultry, aquaculture species, wildlife, animal welfare, biotechnology, disease outbreaks, feeds, food safety, international trade, parasitoses, drugs, environment, rabies, bluetongue virus; Retroviridae, *Leptospira*, Aujeszky virus, *Salmonella*, *Mycobacterium bovis*, *Mycobacterium avium* ssp. *paratuberculosis*, USA.

Zieger, U.; Pandey, G.S.; Kriek, N.P.J.; Cauldwell, A.E. **Tuberculosis in Kafue lechwe (*Kobus leche kafuensis*) and in a bushbuck (*Tragelaphus scriptus*) on a game ranch in Central Province, Zambia.** *Journal of the South African Veterinary Association*. 1998. 69 (3) 98-101.

**NAL call number:** 41.8 SO8

**Descriptors:** *Mycobacterium*, free-ranging animals, game ranch, case studies, role of Kafue lechwe as disease reservoir, Zambia.

Zorawski, C.; Lipiec, M. **Dzikie zwierzęta jako rezerwuaria *Mycobacterium bovis* w przyrodzie.** [Wild animals as a reservoir of *Mycobacterium bovis*.] *Nowa Weterynaria*. 1998. 3 (2) 21-25. Note: In Polish.

**Descriptors:** bison, epidemiology, bacterial diseases, public health, tuberculosis, *Mycobacterium bovis*, Poland.

## 1997

Higgins, A.J. **Tuberculosis and badgers--facing up to facts.** *Veterinary Journal*. Mar 1997. v. 153 (2) 117-118. ISSN: 1090-0233

**NAL call number:** SF601.V484

**Descriptors:** *Mycobacterium tuberculosis*, cattle, badgers, *Meles meles*, tuberculosis, reservoir hosts, disease control.

Hutchings, M.R.; Harris, S. **Effects of farm management practices on cattle grazing behaviour and the potential for transmission of bovine tuberculosis from badgers to cattle.** *Veterinary Journal*. Mar 1997. 153 (2) 149-162. ISSN: 1090-0233

**NAL call number:** SF601.V484

**Abstract:** Despite the large body of circumstantial evidence to suggest a link, the means by which bovine tuberculosis is passed from badgers to cattle remains unclear; pasture contamination with the urine, faeces and/or sputum of infectious badgers is believed to be the main route of transmission. Therefore the behaviour of grazing cattle was studied to determine whether they avoided investigating and/or grazing pasture contaminated with badger excreta, and whether different farm management practices enhanced the potential for disease transmission. Active latrines were avoided by most cattle until the sward length in the rest of the field was reduced, after which there was an increasing likelihood that active badger latrines would be grazed. Most of the cattle grazed active badger latrines, but cattle of low rank within the herd grazed latrines more heavily. Farm management practices that reduced the availability of long swards shortened the period of investigative behaviour and greatly enhanced the risk that cattle would graze active badger latrines. Cattle were more likely to graze pasture away from latrines that was contaminated either with badger urine or single faeces. Because bacilli remain viable in the soil for up to 2 years, there is the potential for bacilli to accumulate at active badger latrines, and these could pose a significant risk to cattle, even when the latrine is no longer being used by badgers. Cattle readily grazed the lush sward at disused latrines, during which they could ingest contaminated soil; the amount of soil ingested increases as sward length decreases.

**Descriptors:** *Mycobacterium*, cattle tuberculosis, *Meles meles*, disease transmission, grazing, pasture contamination, excreta, plant height, rotational grazing, cutting of swards.

Krebs, John R. Great Britain. Ministry of Agriculture, Fisheries and Food. Scottish Office. Agriculture, Environment and Fisheries Dept. Welsh Office. Agriculture Dept. *The Government's Response to the Krebs Report on Bovine Tuberculosis in Cattle and Badgers*. London, Ministry of Agriculture, Fisheries and Food, c1997. [8] p.

**NAL call number:** SF967.T8G74 1997

**Descriptors:** tuberculosis in cattle, badgers, *Mycobacterium*, *Meles meles*, disease reservoirs, prevention and control, *Mycobacterium*, Great Britain.

Krebs, J. R. (John R.) Independent Scientific Review Group (Great Britain ) Great Britain Ministry of Agriculture, Fisheries and Food. *Bovine Tuberculosis in Cattle and Badgers: Report to the Rt. Hon. Dr. Jack Cunningham, MP*. London, Ministry of Agriculture, Fisheries and Food, 1997. 191 p.

**NAL call number:** SF967.T8K74 1997

**Descriptors:** tuberculosis, cattle, badgers, *Meles meles*, control, prevention, badgers, disease reservoirs, *Mycobacterium*, Great Britain.

Schmitt, S.M.; Fitzgerald, S.D.; Cooley, T.M.; Bruning-Fann, C.S.; Sullivan, L.; Berry, D.; Carlson, T.; Minnis, R.B.; Payeur, J.B.; Sikarskie, J. **Bovine tuberculosis in free-ranging white-tailed deer from Michigan.** *Journal Wildlife Disease*. Oct 1997. 33 (4) 749-758. ISSN: 0090-3558

**NAL call:** 41.9 W64B

**Descriptors:** white-tailed deer, *Odocoileus virginianus*, *Mycobacterium bovis*, wild animals, bovine tuberculosis.

Whipple, D.L.; Meyer, R.M.; Berry, D.F.; Jarnagin, J.L.; Payeur, J.B. **Molecular epidemiology of tuberculosis in wild white-tailed deer in Michigan and elephants.** *Proceedings One Hundred and First Annual Meeting of the United States Animal Health Association, Louisville, Kentucky, USA, 18-24 October, 1997*. Richmond, United States Animal

Health Association. 1997. p. 543-546.

**NAL call number:** 49.9 UN3R

**Descriptors:** epidemiology, *Cervus elaphus*, *Odocoileum virginianus*, coyotes, red deer, elephants, tuberculosis, DNA fingerprinting, restriction fragment length polymorphism, RFLP, Michigan, California.

### Miscellaneous Publications

United States. Congress. House. Committee on Agriculture. Subcommittee on Livestock. *Emergency Cervidae Tuberculosis Protection Act: hearing before the Subcommittee on Livestock of the Committee on Agriculture, House of Representatives, One Hundred Third Congress, second session, on H.R. 3417, February 3, 1994*. Washington: U.S. G.P.O.: For sale by the U.S. G.P.O., Supt. of Docs., Congressional Sales Office, 1994. iii, 98 p. ill., map. ISBN: 0160445221. Note: Distributed to some depository libraries in microfiche. Shipping list no.: 94-0246-P. "Serial no. 103-54." Includes bibliographical references. SUDOCS: Y 4.AG 8/1:103-54.

**NAL call number:** KF27.A349 1994

**Descriptors:** tuberculosis, laws and legislation, deer diseases, *Mycobacterium*, prevention, control, U.S.

United States. Congress. House. Committee on Agriculture. Subcommittee on Livestock, Dairy, and Poultry. *Increase in deer and elk tuberculosis: hearing before the Subcommittee on Livestock, Dairy, and Poultry of the Committee on Agriculture, House of Representatives, One hundred second Congress, second session, August 5, 1992*. Washington, [D.C.]: U.S. G.P.O.: For sale by the U.S. G.P.O., Supt. of Docs., Congressional Sales Office, 1992. iii, 174 p., ill. ISBN: 0160395046. Note: Distributed to some depository libraries in microfiche. Shipping list no.: 93-0100-P. "Serial no. 102-91." SUDOCS: Y 4.AG 8/1:102-91.

**NAL call number:** KF27.A366 1992c

**Descriptors:** tuberculosis, deer diseases, elk diseases, disease prevention and control, *Mycobacterium*, wildlife, US.

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# Birds

2007

Dvorska, L.; Matlova, L.; Ayele, W.Y.; Fischer, O.A.; Amemori, T.; Weston, R.T.; Alvarez, J.; Beran, V.; Moravkova, M.; Pavlik, I. **Avian tuberculosis in naturally infected captive water birds of the Ardeideae and Threskiornithidae families studied by serotyping, IS901 RFLP typing, and virulence for poultry.** *Veterinary Microbiology*. 2007; 119 (2/4): 366-374. ISSN: 0378-1135

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** Avian tuberculosis was detected in one flock of 38 water birds of the families Ardeideae (n=20) and Threskiornithidae (n=18). *Mycobacterium avium* subsp. *avium* (MAA, serotype 1, genotype IS901+ and IS1245+) was more often (p=0.01) detected in tissue and/or fecal samples in 18 (90.0%) birds from the Ardeideae family: little egret (*Egretta garzetta*), buff-backed heron (*Bubulcus ibis*), great white egret (*Egretta alba*), and bittern (*Botaurus stellaris*) in comparison to two (11.1%) birds from the Threskiornithidae family: sacred ibis (*Threskiornis aethiopicus*). Avian tuberculosis was not diagnosed in spoonbills (*Platalea leucorodia*). Tuberculous lesions were found in nine birds.

MAA isolates of IS901 RFLP type F-C3 were present in all of the 20 infected birds and in all environmental isolates. A mixed infection with the MAA isolates of three RFLP types F-C3 (tissue isolate), G-C3, and T-C3 (fecal isolates) was found in one sacred ibis. All 20 tissue isolates of IS901 RFLP type F-C3 from 20 birds and 8 environmental MAA isolates were fully virulent in pullets, whilst the isolates of RFLP types G-C3 and T-C3 were non-virulent in pullets.

All of the tested MAA isolates had the same IS1245 RFLP "bird profile". In 12 of 20 infected birds with MAA *M.a. hominissuis* isolates of serotypes 4, 8, 9 and genotype IS901- and IS1245+ were detected and in 8 other birds mycobacteria not belonging to the *M. avium* complex were found. The presence of MAA in the environment may be a source for further spread of the causal agent of avian tuberculosis among other groups of animals in zoological gardens, farm animals, and also among their keepers..

**Descriptors:** bird diseases; wildlife disease reservoirs; Ardeideae family: little egret (*Egretta garzetta*), buff-backed heron (*Bubulcus ibis*), great white egret (*Egretta alba*), and bittern (*Botaurus stellaris*); comparison to two birds of the Threskiornithidae family: sacred ibis (*Threskiornis aethiopicus*); avian tuberculosis not diagnosed in spoonbills (*Platalea leucorodia*).

Travis, Erika K.; Junge, Randall E.; Terrell, Scott P. **Infection with *Mycobacterium simiae* complex in four captive Micronesian kingfishers.** *Journal of the American Veterinary Medical Association*. 2007; 230 (10): 1524-1529. ISSN: 0003-1488

**URL:** <http://www.avma.org/>

**NAL Call Number:** 41.8 AM3

**Abstract:** Case Description - 4 captive adult Micronesian kingfishers (*Halcyon cinnamomina cinnamomina*) at 3 zoologic institutions were examined routinely or because of dyspnea or lethargy. Clinical Findings - All birds had marked hepatomegaly. Two birds had dyspnea caused by compression of air sacs by the enlarged liver, and 1 bird had generalized weakness and lethargy. Three birds had distended coelomic cavities, and 3 birds were thin or had lost weight. There were no consistent abnormalities in blood analytes. Results of most ancillary diagnostic tests such as acid-fast staining of cloacal or fecal swab specimens and culture of feces for acid-fast bacteria were negative. Results of examination of hepatic biopsy specimens in 2 of 4 birds were suggestive of mycobacteriosis. Treatment and Outcome - 3 birds died or were euthanized soon after diagnosis. One kingfisher was isolated and monitored for 4 months without treatment and died during anesthesia for disease monitoring. Postmortem histologic examination revealed histiocytic hepatitis and acid-fast bacteria in all 4 birds. Bacteriologic culture of liver specimens yielded *Mycobacterium simiae* complex in all 4 birds. Clinical Relevance - Infection with *M simiae* complex should be considered in ill Micronesian kingfishers, and further monitoring is warranted to determine whether this is an emerging pathogen in this species.

**Descriptors:** captive birds, adult Micronesian kingfishers (*Halcyon cinnamomina cinnamomina*), clinical picture, *Mycobacterium simiae* complex, pathology of various organs, liver, digestive system, feces, lung.

Ahmed, J.S.; Alp, H.; Aksin, M.; Seitzer, U. **Animal transboundary diseases: European Union and Asian network of veterinary research cooperation for quality livestock production.** *Journal of Veterinary Medicine Series B.* 2006; 53 (Suppl. 1): 2-6.

**URL:** <http://www.blackwell-synergy.com/doi/abs/10.1111/j.1439-0450.2006.01010.x>

**Descriptors:** livestock, trans-country boundary diseases, rapidly expanding and acute in nature, effects, regional cooperation needed, early recognition of disease, keep disease localized, FMD, *Mycobacterium bovis*, peste des petits ruminants virus, avian flu, cattle, plague, bird grippe, EU.

Atasever, A.; Beyaz, L.; Kbar, M.; Gumussoy, K.S. **A case of tuberculosis and aspergillosis in a Long-legged Buzzard (*Buteo rufinus*).** *Revue de Medecine Veterinaire.* 2006; 157 (1): 26-29. ISSN: 0035-1555. Note: In English with a French summary.

**URL:** <http://revmedvet.com/>

**NAL Call Number:** 41.8 R32

**Descriptors:** Long-Legged Buzzard (*Buteo rufinus*), 4 year old female, mass under wing, case study, *Aspergillus fumigatus*, *Mycobacterium*, necrotic masses, differential diagnosis, Ziehl-Neelsen, Gridley's staining, Gram (+) and acid-fast bacteria, Turkey.

Fontenot, D.K.; Terrell, S.P.; Malakooti, K.; Medina, S. **Health assessment of the Guam rail (*Gallirallus owstoni*) population in the Guam rail recovery program.** *Journal of Avian Medicine and Surgery.* 2006; 20 (4): 225-233. ISSN: 1082-6742

**URL:** <http://www.bioone.org/perlserv/?request=get-archive&issn=1082-6742>

**NAL Call Number:** SF994.J6

**Descriptors:** captive island animals, Guam rail (*Gallirallus owstoni*), health assessment for pre-release, domestic chickens, blood counts, plasma analysis, ELISA for *Mycobacterium bovis*, enteric pathogens, Guam, Rota.

Fragkiadaki, E.; Ikononopoulos, J.; Balaskas, C.; Gazouli, M. **Mycobacterial infections of fowl.** *Deltion tes Ellenikes Kteniatrikes Etaireia. [Journal of the Hellenic Veterinary Medical Society.]* 2006; 57 (2): 127-139. ISSN: 0257-2354. Note: In Greek with an English summary.

**NAL Call Number:** 41.9 SO18

**Descriptors:** fowls, chickens, domestic birds, mycobacteriosis, numerous species found to infect birds, clinical picture, public health concerns, zoonotic diseases, serotypes, diagnostic tests, PCR, *Mycobacterium avium* complex, *Mycobacterium genavense*, *Mycobacterium intracellulare*, *Mycobacterium avium* ssp *avium*, *Mycobacterium avium* ssp *hominissuis*.

Bertelsen, M.F.; Grondahl, C.; Giese, S.B. **Disseminated *Mycobacterium celatum* infection in a white-tailed trogon (*Trogon viridis*).** *Avian Pathology.* 2006 Aug; 35 (4): 316-319. ISSN: 0307-9457

**NAL Call Number:** SF995.A1A9

**Abstract:** An adult female white-tailed trogon (*Trogon viridis*) was presented with abdominal enlargement and hard subcutaneous masses. Necropsy findings included bony masses extending from skeletal structures, disseminated pale foci in the liver, and a pale mass in the kidney. Histological examination revealed multifocal to coalescing granulomatous inflammation in the bone, liver, kidney, lung and spleen. *Mycobacterium celatum* was isolated from the liver and identified by DNA sequencing. This is the first report of *M. celatum* infection in an avian species.

**Descriptors:** wild birds, zoo animals, *Mycobacterium celatum*, mycobacterial diseases, poultry diseases, female, case study, new host records, histopathology, inflammation, animal tissues, pathogen identification, nucleotide sequences, *Trogon viridis*, molecular sequence data.

Clarke, K.R.; Firlgerald, S.D.; Hattey, J.A.; Bolin, C.A.; Berry, D.E.; Church, S.V.; Reed, W.M. **Experimental inoculation of wild turkeys (*Meleagris gallopavo*) with *Mycobacterium bovis*.** *Avian Diseases.* 2006; 50 (1): 131-134. ISSN: 0005-2086

**URL:** <http://avdi.allenpress.com/avdionline/?request=index-html>

**NAL Call Number:** 41.8 AV5

**Descriptors:** susceptibility of birds to *Mycobacterium bovis*, wild turkeys, experimental inoculation, trachea and oral routes, fecal cultures negatives, 30days, 60 days, 90 days, sampling, passive persistence, no lesions, minimal disease

reservoir.

Orosz, S.E. **PCR diagnostics: what they do and don't do.** *Small Animal and Exotics Proceedings of the North American Veterinary Conference, Volume 20, Orlando, Florida, USA, 7-11 January, 2006.* 2006; 1570-1572

**URL:** <http://www.tnavc.org>

**Descriptors:** birds, avian influenza virus, beak and feather disease virus, Herpesviridae, *Mycobacterium*, Polyomavirus, West Nile virus, *Chlamydomphila*, bird gripe, DNA, RNA, PCR.

Rosenthal, K.L. **Microbiology: revisiting the gram stain and culture.** *Small Animal and Exotics Proceedings of the North American Veterinary Conference, Volume 20, Orlando, Florida, USA, 7-11 January, 2006.* 2006: 1575-1577

**URL:** <http://www.tnavc.org>

**Descriptors:** pet birds, bacterial infections, *Enterococcus*, *Escherichia coli*, *Klebsiella*, *Mycobacterium*, *Mycoplasma*, *Proteus*, *Pseudomonas*, *Staphylococcus aureus*, *Chlamydomphila*, Gram stain, culture methods.

Sabocanec, R.; Konjevic, D.; Curic, S.; Cvetnic, Z.; Spicic, S. **Spontaneous *Mycobacterium avium* serovar 2 infection in a Muscovy duck (*Cairina moschata*) - a case report.** *Veterinarski Arhiv.* 2006; 76 (2): 185-192. ISSN: 0372-5480. Note: In English with a Croatian summary.

**URL:** <http://www.vet.hr/vetarhiv>

**NAL Call Number:** 41.8 V6416

**Descriptors:** male Muscovy ducks (*Cairina moschata*), avian tuberculosis, *Mycobacterium avium* ssp. *avium* serovar 2, case study, clinical picture, granulomatous lesions, liver and spleen, tubercles, histopathology, PCR analysis, insertion sequence Is901, Croatia.

## 2005

Bereg, A.; Fodor, L.; Molnar, V.; Sos, E.; Gal, J.; Fancsi, G.; Felkai, F. **Madarak által terjesztett zoonosisok. Irodalmi összefoglalás. Zoonoses spread by birds. Literature review.** *Magyar Allatorvosok Lapja.* 2005; 127 (12): 733-742. ISSN: 0025-004X. Note : In Hungarian with an English summary.

**Descriptors:** pet birds, veterinary care, zoonotic pathogens, Newcastle disease, influenza, equine encephalomyelitis (eastern and western), flavivirus infections, rabies, tuberculosis, salmonellosis, yersiniosis, campylobacteriosis, chlamydiosis and some other diseases caused by bacteria (colibacteriosis, erysipelas and listeriosis), fungi (histoplasmosis, cryptococcosis and trichophytosis) and parasites (toxoplasmosis, cryptosporidiosis and giardiasis).

Coburn, H.L.; Snary, E.L.; Kelly, L.A.; Wooldridge, M. **Qualitative risk assessment of the hazards and risks from wild game.** *Veterinary Record* (London). 2005; 157(11): 321-322. ISSN: 0042-4900.

**URL:** <http://veterinaryrecord.bvapublications.com/>

**NAL Call Number:** 41.8 V641

**Descriptors:** zoonotic disease hazards, risk assessment, bacterial diseases, game animal meat, birds, ducks, deer, larger animals, rabbits, food contamination, food hygiene, food safety, health hazards, human diseases, lead shot, meat animals, meat quality, risk factors, risk assessment, risk factors, *Campylobacter jejuni*, *Escherichia coli*, *Mycobacterium avium* complex, *Mycobacterium bovis*, *Salmonella*, *Chlamydomphila psittaci*, hazard analysis and critical control point.

Fitzgerald, S.D.; Boland, K.G.; Clarke, K.R.; Wismer, A.; Kaneene, J.B.; Berry, D.E.; Church, S.V.; Hattey, J.A.; Bolin, C.A. **Resistance of mallard ducks (*Anas platyrhynchos*) to experimental inoculation with *Mycobacterium bovis*.** *Avian Diseases.* 2005; 49 (1): 144-146. ISSN: 0005-2086

**URL:** <http://avdi.allenpress.com/avdionline/?request=index-html>

**NAL Call Number:** 41.8 AV5

**Descriptors:** mallard ducks (*Anas platyrhynchos*), susceptibility to infection with *Mycobacterium bovis*, possible reservoir for pathogen, experimental infection, high dose oral or intra-tracheal inoculation, no evidence of disease found, unlikely reservoir of disease pathogens, disease resistance levels.

Gerhold, R.W.; Fischer, J.R. **Avian tuberculosis in a wild turkey.** *Avian Diseases.* 2005 Mar; 49 (1): 164-166. ISSN: 0005-2086. Note: In English with a Spanish summary.

**NAL Call Number:** 41.8 Av5

**Abstract:** A liver from a hunter-harvested wild turkey (*Meleagris gallopavo*) from Kansas was evaluated by the Southeastern Cooperative Wildlife Disease Study. Grossly, the liver contained several grayish-white masses ranging from 0.5-3 cm in diameter. These masses were scattered throughout the parenchyma and bulged from the capsular surface. Histologic examination revealed multifocal to coalescing granulomas with low numbers of acid-fast bacilli within multinucleated giant cells at the periphery of the granulomas. Culture of the liver yielded *Mycobacterium avium* subspecies *avium* and low numbers of *Staphylococcus intermedius*.

**Descriptors:** wild turkeys, *Meleagris gallopavo*, game birds, avian tuberculosis, bird diseases, case studies, liver, histopathology, *Mycobacterium avium* subsp. *avium*; animal pathogenic bacteria, *Staphylococcus intermedius*, new host records, Kansas.

Kul, O.; Tunca, R.; Hazroglu, R.; Dker, K.S.; Karahan, S. **An outbreak of avian tuberculosis in peafowl (*Pavo cristatus*) and pheasants (*Phasianus colchicus*) in a zoological aviary in Turkey.** *Veterinari Medicina*. 2005; 50 (10): 446-450. ISSN:

**URL:** <http://vetmed.vri.cz>

**NAL Call Number:** 41.9 C333

**Descriptors:** peafowl (*Pavo cristatus*), pheasants (*Phasianus colchicus*), turkeys, avian tuberculosis, *Mycobacterium avium* ssp *avium*, lung granulomas, caseo necrosis, multinucleated giant cells, tissue sampling, captive fowl, Turkey.

Mellor, D.J.; Russell, A.M.; Wood, J.L.N. (Editors). *Society for Veterinary Epidemiology and Preventive Medicine. Proceedings of a Meeting Held at Nairn, Inverness, Scotland, 30th March-1st April 2005*. Published by the Society. 2005. 277 pp. ISBN: 0948073691.

**Descriptors:** many papers, topics include animals diseases, epidemiology, disease prevalence, disease transmission and spread, disease control and prevention, diagnosis, reservoir hosts, public health aspects, bovine tuberculosis, *Mycobacterium bovis*, classical swine fever, rabies, pancreatic necrosis virus, foot and mouth disease, avian influenza A virus, *Streptococcus suis*, *Escherichia coli*, *Campylobacter*, *Salmonella* spp., *Ostertagia ostertagi*, broilers, domestic livestock, wild animal disease carriers, UK.

Styles, D.K. **Bacterial disease and antimicrobial therapy in avian species.** *Small Animal and Exotics Proceedings of the North American Veterinary Conference, Volume 19, Orlando, Florida, USA, 8-12 January, 2005*. 2005: 1235-1236

**URL:** <http://www.navc.org>

**Descriptors:** birds, bacterial diseases, antibiotic therapy, *Chlamydia psittaci*, *Mycobacterium*, *Mycoplasma*, *Psittaciformes*, *Salmonella*.

Takahashi, K.; Akiba, Y. **Single administration of xylitol to newly hatched chicks enhances growth, digestive enzyme activity and immune responses by 12d of age.** *British Poultry Science*. 2005 Oct; 46 (5): 635-640. ISSN: 0007-1668

**NAL Call Number:** 47.8 B77

**Abstract:** 1. An experiment was conducted to determine the effect of a single administration of xylitol to newly hatched chicks on growth, digestive enzyme activity and immune responses at 12 d of age. 2. Female broiler chicks (Cobb) were given 0.5 ml of either 20% glucose, 20% xylitol or water alone within 24 h after hatch. Thereafter, all chicks were reared under conventional conditions and given a commercial broiler starter diet until 12 d of age in experiment 1. In experiment 2, they were deprived of feed and water for 24 h and kept at 27 degrees C to mimic transportation stress before given feed and water. 3. Body weights at 5 d of age did not differ among the treatments, but at 12 d of age chicks given 20% xylitol showed greater body weight than those in the other treatment groups. Bursa weight (mg per 100 g body weight) was greater in chicks given xylitol solution than in chicks given glucose solution or water at 5 and 12 d of age. 4. Amylase and chymotrypsin activities in the pancreas of chicks given xylitol solution were higher than in chicks given water or glucose solution at 5 and/or 12 d of age. 5. A single administration of xylitol within 24 h after hatch increased splenocyte proliferation against concanavalin A and pokeweed mitogen, and antibody titres to keyhole limpet haemocyanin (KLH) and *Mycobacterium butyricum* (Mb) as compared to glucose, administration at 12 d of age, but not as compared to water administration. 6. These results indicated that xylitol may be a functional carbohydrate source to improve growth rate and health and to relieve transportation stress in broiler chicks.

**Descriptors:** chicks, broilers, females, xylitol as carbohydrate source, chymotrypsin, enzyme activity, immune responses, animal stress of animal transport, feed supplements, bacterial toxins, feed deprivation, broiler feeding, water

deprivation, liveweight gain, amylases, pancreas, bursa of Fabricius, tissue weight, splenocytes, cell proliferation, poultry diseases, *Mycobacterium butyricum*, toxins, mycobacterial diseases

## 2004

Tadesse, S.; Woldemeskel, M.; Molla, B.; Tibbo, M.; Kidane, D.; Medhin.; Britton, S. **Avian mycobacteriosis in domestic chickens from selected agro-climatic regions in Ethiopia.** *Journal of Applied Research in Veterinary Medicine*. 2004, 1(1) 17-25. ISSN: 1542-2666.

**NAL call number:** SF601.J63

**Descriptors:** *Mycobacterium avium* complex, avian mycobacteriosis, natural host, postmortem examinations, histopathology, culture and virulence testing, granulomas, prevalence, virulence, chickens, Ethiopia.

Zsivanovits, H.P.; Neumann, U.; Brown, M.J.; Cromie, R.L. **Use of an enzyme-linked immunosorbent assay to diagnose avian tuberculosis in a captive collection of wildfowl.** *Avian Pathology*. 2004 Dec; 33 (6): 571-575. ISSN: 0307-9457

**NAL Call Number:** SF995.A1A9

**Descriptors:** wild birds, geese, ducks, swans, avian tuberculosis, *Mycobacterium avium*, enzyme linked immunosorbent assay, ELISA, accuracy of disease diagnosis, test sensitivity, test specificity, clinical examination, PCR, polymerase chain reaction, Wales.

## 2002

Coe, A. **Causes of death in wild birds.** *Veterinary Times*. 2002, 32 (33) 20. ISSN: 1352-9374

**Descriptors:** birds, carcasses, disease mortality, nervous system diseases, encephalitis poisoning, salmonellosis, toxicity, trichomoniasis, tuberculosis, *Mycobacterium*, wild birds, zoonoses, *Escherichia coli*, paramyxovirus, *Salmonella typhimurium*, Trichomonas, West Nile virus.

Gonzalez, M.; Rodriguez-Bertos, A.; Gimeno, I.; Flores, J.M.; Pizarro, M. **Outbreak of avian tuberculosis in 48-week-old commercial layer hen flock.** *Avian Diseases*. 2002, 46 (4) 1055-1061. ISSN: 0005-2086 Note: In English with a Spanish summary.

**NAL call number:** 41.8 AV5

**Descriptors:** chickens, hens, disease outbreaks, mortality levels, case reports, clinical aspects, diagnosis, egg production, emaciation, epidemiology, feed intake, granuloma, histopathology, mortality, *Mycobacterium avium*, Spain.

Hoop, R.K. **Mycobacterium tuberculosis infection in a canary (*Serinus canaria L.*) and a blue-fronted Amazon parrot (*Amazona amazona aestiva*).** *Avian Diseases*. Apr/June 2002. 46 (2) 502-504. ISSN: 0005-2086. Note: In English with a Spanish summary.

**NAL call number:** 41.8 AV5

**Abstract:** I report two cases of mycobacteriosis in pet birds due to *Mycobacterium tuberculosis* and discuss the zoonotic implications. The canary with a tuberculous knot in the lung is the first description of *M. tuberculosis* in a nonsittacine bird species.

**Descriptors:** canaries, *Serinus canaria*, *Mycobacterium tuberculosis* infections, Amazon parrot, *Amazona amazona aestiva*, case reports, zoonoses, lungs, new host records.

Reball, H. **Zubildung im Bereich des Karpalgelenks bei einem Wanderfalken. [Swelling in the carpal joint region of a peregrine falcon.]** Tierärztliche Praxis. Ausgabe K, Kleintiere Heimtiere. 2002, 30 (5) 385, 389-392. ISSN: 1434-1239. Note: In German.

**NAL call number:** SF603.V4

**Descriptors:** *Falco peregrinus*, 2 year old animal, *Mycobacterium avium intracellulare*, case reports, diagnosis, joint diseases, post-mortem examination, Germany.

## 2001

Beytut, E.; Atabay, H.I.; Akca, A. **Tuberculosis and sarcosporidiosis in the periorbital region of a hen.** *Kafkas Universitesi Veteriner Fakultesi Dergisi*. 2001. 7 (2) 213-217. Note: In Turkish with an English summary.

**Descriptors:** case reports, clinical aspects, diagnosis, hen eyes, histopathology, mixed infections, postmortem examinations, poultry, sarcocystosis, tuberculosis, *Mycobacterium*, *Mycobacterium avium*, *Sarcocystis*, parasitic protozoa, chickens, Turkey.

Butler, K.L.; Fitzgerald, S.D.; Berry, D.E.; Church, S.V.; Reed, W.M.; Kaneene, J.B. **Experimental inoculation of European starlings (*Sturnus vulgaris*) and American crows (*Corvus brachyrhynchos*) with *Mycobacterium bovis*.** *Avian Diseases*. 2001; 45 (3): 709-718. ISSN: 0005-2086. Note: In English with a Spanish summary.

**URL:** <http://avdi.allenpress.com/avdionline/?request=index-html>

**NAL Call Number:** 41.8 AV5

**Abstract:** The purpose of this series of pilot studies was to determine whether the passerine species studied are susceptible to infection with *Mycobacterium bovis*. Separate experiments were conducted on wild-caught starlings (*Sturnus vulgaris*) and American crows (*Corvus brachyrhynchos*). In each experiment, four birds were challenged intraperitoneally and four were challenged orally with microorganisms. Challenge dose was  $1 \times 10^5$  colony-forming units of *M. bovis* cultured from a white-tailed deer (*Odocoileus virginianus*) case in Michigan. Birds were euthanatized at 1 and 2 mo postinoculation. Histologic lesions suggestive of mycobacteriosis, without the presence of acid-fast bacilli, were noted in all experimental groups. Mycobacterial cultures performed on pooled tissue samples were positive for *M. bovis* in only some of the intraperitoneal inoculates of each species.

**Descriptors:** *Sturnus vulgaris*, *Corvus brachyrhynchos*, *Mycobacterium bovis*, experimental infection, intraperitoneal injection, oral administration, mycobacterial diseases, susceptibility, lesions, postmortem examinations.

Cheng, ShiPeng; Wang, KeJian; Chen, LiZhi; Liu, XiaoYing; Zhang, JunFeng. **Development of pheasant tuberculosis vaccine and immunological test.** *Journal of Economic Animal*. 2001. 5 (2) 27-31. Note: In Chinese with an English summary.

**Descriptors:** antibodies, combined vaccines, immunity, immunization, inactivated vaccines, tuberculosis, vaccination, *Mycobacterium avium*, *Phasianus*, pheasants.

Hadjiev, G. **Zdravstvena zastita zivine u Bugarskoj. [Veterinary care for poultry in Bulgaria.]** *Zivinarstvo*. 2001. 36 (6-7) 129-132. Note: In Serbian.

**Descriptors:** broiler chicken hens, chicken meat, egg production, exports, imports, Marek's disease, Newcastle disease, pasteurellosis, poultry farming, tuberculosis, *Pasturella*, *Salmonella gallinarum*, *Salmonella pullorum*, Bulgaria.

Kauppinen, J.; Hintikka, E.L.; Iivanainen, E.; Katila, M.L. **PCR-based typing of *Mycobacterium avium* isolates in an epidemic among farmed lesser white-fronted geese (*Anser erythropus*).** *Veterinary Microbiology*. July 3, 2001. 81 (1) 41-50. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Abstract:** *Mycobacterium avium* is an important veterinary pathogen causing avian tuberculosis in birds. The aim of the study was to evaluate the genetic relatedness in *M. avium* isolates from deep tissues of farmed lesser white-fronted geese with avian tuberculosis and in samples from the farm environment. The strains were analyzed by two PCR-based typing methods, inverted repeat (IR) typing and random amplified polymorphic DNA (RAPD) analysis. The primers for the inverted repeats of the insertion sequences IS1245 and IS1311 were used in IR typing, and the RAPD analysis was performed with six primers. Seven of the nine avian strains yielded an identical pattern in the IR typing, but they could be divided into two groups in the RAPD analysis. The remaining two bird isolates had an identical IR pattern (IR cluster II) which they shared with two environmental isolates. However, the RAPD analysis revealed that these environmental isolates had a RAPD pattern (RAPD cluster VI) distinct and different from either of the bird isolates (RAPD clusters II and IV). In all, four *M. avium* strains were verified as being inducers of avian tuberculosis in birds, and all were distinct from the three environmental strains identified. Thus, the results did not confirm the preliminary idea that a single strain had caused the epidemic. The polymorphism among *M. avium* strains highlighted the great biodiversity among an *M. avium* population even in a limited environmental setting during a short time span, and indicated the high susceptibility to avian tuberculosis of lesser white-fronted geese.

**Descriptors:** *Anser erythropus*, geese, *Mycobacterium avium*, polymerase chain reaction, genotypes, identification, strain differences, genetic distance, random amplified polymorphic DNA, nucleotide sequences, epidemics, genetic diversity, susceptibility.

Ozcan, K.; Beytut, E.; Aydin, F.; Tuzcu, M. **Tuberculosis in geese (*Anser anser*) in Turkey.** *Avian Diseases*. July/Sept 2001. 45 (3) 755-759. ISSN: 0005-2086. Note: In English with a Spanish summary.

**NAL Call Number:** 41.8 Av5

**Abstract:** Tuberculosis was detected in seven geese at the breeding unit of the Faculty of Veterinary Medicine, Kafkas University, during 1998. In the necropsy, lesions of nodular type were seen in the liver, spleen, and lungs. Histopathologically, the lesions were characterized by central areas of caseous necrosis surrounded by epithelioid cells, multinucleated giant cells, lymphocytes, and an outer fibrous capsule. Acid-fast bacilli were visualized by the Ziehl-Neelsen staining method in paraffin sections and smears. Inoculation into Lowenstein-Jensen media with glycerin yielded *Mycobacterium* spp.

**Descriptors:** geese, tuberculosis, *Mycobacterium*, liver, spleen, lungs, histopathology, case reports, Turkey.

Resanovic, R. **Bolesti kaveznih ptica prenosive na ljude. [Diseases of caged birds transmissible to humans.]** *Zivinarstvo*. 2001. 36 (8-9) 175-177. Note: In Serbian.

**Descriptors:** pet birds, 150 zoonoses, transmission, *Chlamydia psittaci*, *Salmonella enteritidis* and *S. typhimurium*, *Campylobacter fetus* ssp. *jejuni*, *Mycobacterium avium*, *Giardia lamblia*, treatment.

Rodwell, T.C.; Whyte, I.J.; Boyce, W.M. **Evaluation of population effects of bovine tuberculosis in free-ranging African buffalo (*Syncerus caffer*).** *Journal of Mammalogy*. 2001. 82 (1) 231-238. ISSN: 0022-2275

**NAL call number:** 410 J823

**Descriptors:** bovine tuberculosis, buffalo, age differences in susceptibility, epidemiology, herd surveys, *Mycobacterium tuberculosis*, *Syncerus caffer*.

Rodwell, T.C.; Kriek, N.P.; Bengis, R.G.; Whyte, I.J.; Viljoen, P.C.; de Vos, V.; Boyce, W.M. **Prevalence of bovine tuberculosis in African buffalo at Kruger National Park.** *Journal of Wildlife Diseases*. 2001. 37 (2) 258-264. ISSN: 0090-3558

**NAL call number:** 41.9 W64B

**Descriptors:** tuberculosis, *Mycobacterium bovis*, free ranging African buffalo, *Syncerus caffer*, disease prevalence, culling program, prevalence, disease transmission risks, population effects, South Africa.

Schulze, C.; Heidrich, R. **Megabakterien-assoziierte Proventrikulitis beim Nutzgeflügel in Brandenburg. [Megabacteria-associated proventriculitis in poultry in the state of Brandenburg, Germany.]** *Deutsche Tierärztliche Wochenschrift*. 2001. 108 (6) 264-266. Note: In German with an English summary.

**NAL call number:** 41.8 D482

**Descriptors:** avian tuberculosis, *Mycobacterium*, clinical aspects, coccidiosis, cocks, diagnosis, diagnostic techniques, hens, egg laying performance, mortality, laying hens, turkey, proventriculus, runting, salmonellosis, tuberculosis, *Chlamydia*, *Histomonas*, Germany.

Thorel, M.F.; Huchzermeyer, H.F.; Michel, A.L. ***Mycobacterium avium* and *Mycobacterium intracellulare* infection in mammals.** *Revue Scientifique et Technique Office International des Epizooties*. 2001. 20 (1) 204-218. Note: In English with French and Spanish summaries.

**NAL call number:** SF781 R4

**Descriptors:** domestic animals, immunosuppression, post slaughter survey, soil microbes, tuberculosis, water, cats, dogs, small mammals, wild animals, wild birds, zoonotic diseases.

Wozikowski, R. **Gruzlica u fermowych strusi afrykanskich. [Tuberculosis in farmed ostriches.]** *Zycie Weterynaryjne*. 2001. 76 (12) 664-665. Note: In Polish.

**NAL call number:** SF604 Z9

**Descriptors:** case reports, pathology, tuberculosis, *Mycobacterium avium* complex, ostriches, Poland.

## 2000

Cromie, R.L.; Ash, N.J.; Brown, M.J.; Stanford, J.L.; Higgins, D.A. (ed.); Warr, G.W. **Avian immune responses to *Mycobacterium avium*: the wildfowl example.** *Developmental and Comparative Immunology. Special issue: The avian immune response to infectious diseases*. 2000. 24 (2-3) 169-185.

**NAL call number:** QR180 D4

**Descriptors:** *Mycobacterium avium*, wildbirds, immune response, antibody formation, antigens, cell mediated immunity, diagnostic assay, poultry, environment, immunity, mycobacterial diseases, tuberculosis, vaccination,

possible vaccine, wild birds, bacterial diseases, perching ducks, geese, swans, screamers.

Fan, G.L.; Zhou, H.C.; Xi, Y.M.; Cao, Y.H.; Fu, W.K.; Lu, B.Z.; Nakaya, Y.; Fujihara, N. **Pathological characteristics of a dead domestic Crested ibis in China.** *Japanese Journal of Zoo and Wildlife Medicine*. 2000. 5 (1) 93-97. Note: In English with a Japanese summary.

**Descriptors:** ibis, case report, degeneration, enteritis, kidney diseases, liver cells, lungs, pathology, population density, survival, tuberculosis, *Mycobacterium*, wild birds, Ciconiiformes, China.

Haagsma, J. **Avian tuberculosis.** *Manual of Standards for Diagnostic Tests and Vaccines. List A and B Diseases of Mammals, Birds and Bees*. 2000. Ed. 4, 718-725. Office International des Epizooties, Paris, France.

**NAL call number:** SF771 M36 2000

**Descriptors:** animal diseases, diagnostic techniques, bird diseases, immunodiagnosis, immunological techniques, intestines, liver, poultry, spleen, tuberculin test, tuberculosis, *Mycobacterium avium* complex.

Phalen, D.N.; Bonagura, J.D. **Avian mycobacteriosis.** *Kirk's Current Veterinary Therapy XIII: Small Animal Practice*. W.B. Saunders, Philadelphia, USA 2000. p. 1116-1118.

**NAL call number:** SF745 K57

**Descriptors:** epidemiology, pathogenesis, diagnosis, zoonoses, treatment, pets birds, *Mycobacterium avium*, *Mycobacterium tuberculosis*.

Ragg, J.R.; Mackintosh, C.G.; Moller, H. **The scavenging behaviour of ferrets (*Mustela furo*), feral cats (*Felis domesticus*), possums (*Trichosurus vulpecula*), hedgehogs (*Erinaceus europaeus*) and harrier hawks (*Circus approximans*) on pastoral farmland in New Zealand: implications for bovine tuberculosis transmission.** *New Zealand Veterinary Journal*. 2000. 48 (6) 166-175.

**NAL call number:** 41.8 N483

**Descriptors:** ferrets, feral cats, possums, hedgehogs, harrier hawks, time lapse video, carrion feeding behavior on carcasses, communal feeding behavior, impact on tuberculosis transmission, cattle diseases, *Mycobacterium*, New Zealand.

Salt, S.; Ozbilgin, S.; Ozmen, O.; Misirlioglu, D. **Bazi yabani ve kafes kuslarinda gozlenen klinik ve patolojik bulgular. [Clinical and pathological findings of some wild and captive birds.]** *Veteriner Fakultesi Dergisi*. 2000. 19 (1-2) 127-132. Note: In Turkish with an English summary.

**NAL call number:** SF1 I78

**Descriptors:** bird diseases, turkeys, budgerigars, pigeons, parrots, canaries, seagull, heron, peacock, various pathologies including tuberculosis, cysts pathological, encephalitis, enteritis, hemorrhage, hepatitis, hyperkeratosis, mycoses, neoplasms, pneumonia, tuberculosis, *Mycobacterium*.

## 1999

Asdrubali, G.; Franciosini, M.P.; Casagrande-Proietti, P.; Rabissi, A.; del Rossi, E. **Su di un episodio di tubercolosi nel fagiano. [A tuberculosis outbreak in pheasants.]** *Selezione Veterinaria*. 1999. No. 8-9, 669-675. Note: XXXVII Convegno della Societa Italiana di Patologia Aviare, Flori, Italy, 1-2 October 1998. In Italian with an English summary.

**NAL Call Number:** 241.71 B75

**Descriptors:** pheasants, *Mycobacterium avium*, case reports, pathology, histopathology, clinical aspects, symptoms, diagnosis, outbreaks, tuberculosis, Italy.

Gyimesi, Z.S.; Stalis, I.H.; Miller, J.M.; Thoen, C.O. **Detection of *Mycobacterium avium* subspecies *avium* in formalin-fixed, paraffin-embedded tissues of captive exotic birds using polymerase chain reaction.** *Journal of Zoo and Wildlife Medicine*. 1999. 30 (3) 348-353.

**NAL Call Number:** SF601.J6

**Descriptors:** archival avian tissues, formalin-fixed, paraffin-embedded tissues, PCR testing, diagnosis of avian tuberculosis, captive exotic birds, amplification of a 189 bp fragment.

Kock, N.D.; Kock, R.A.; Wambua, J.; Kamau, G.J.; Mohan, K. ***Mycobacterium avium*-related epizootic in free-ranging lesser flamingos in Kenya.** *Journal of Wildlife Diseases*. 1999, 35 (2) 297-300. ISSN: 0090-3558.

**NAL Call Number:** 41.9 W64B

**Descriptors:** *Mycobacterium avium* serovar I, free ranging lesser flamingos, *Phoeniconaias minor*, epidemics, avian bacterial diseases, *Escherichia coli*, *Pseudomonas aeruginosa*, liver, spleen lesions, gross and histopathological evaluations, African lakes, Lake Bogoria, Lake Nakuru, Kenya.

Morita, Y.; Maruyama, S.; Hashizaki, F.; Katsube, Y. **Pathogenicity of *Mycobacterium avium* complex serovar 9 isolated from painted quail (*Excalfactoria chinensis*)**. *Journal of Veterinary Medical Science*. 1999. 61 (12) 1309-1312.

**NAL call number:** SF604 J342

**Descriptors:** serovars of *Mycobacterium avium*, painted quail, zoo animals, lesions of liver and spleen, tuberculosis, diagnosis, case reports, experimental infections in chickens, Ueno Zoological Garden, Japan.

Sevcikova, Z.; Ledecy, V.; Capik, I.; Levkut, M. **Unusual manifestation of tuberculosis in an ostrich (*Struthio camelus*)**. *Veterinary Record*. Dec 11, 1999. 145 (24) 708. ISSN: 0042-4900

**NAL call number:** 41.8 V641

**Descriptors:** ostriches, tuberculosis, *Mycobacterium*, conjunctiva, eyelids, histopathology, atypical course, case reports.

Thornton, C.G.; Cranfield, M.R.; MacLellan, K.M.; Brink, T.L. Jr.; Strandberg, J.D.; Carlin, E.A.; Torrelles, J.B.; Maslow, J.N.; Hasson, J.L.B.; Heyl, D.M.; Sarro, S.J.; Chatterjee, D.; Passen, S. **Processing postmortem specimens with C18-carboxypropylbetaine and analysis by PCR to develop an antemortem test for *Mycobacterium avium* infections in ducks**. *Journal of Zoo and Wildlife Medicine*. 1999. 30 (1) 11-24.

**NAL call number:** SF601.J6

**Descriptors:** ducks, Anatidae, *Mycobacterium avium*, polymerase chain reaction, tuberculosis, antemortem screening test, zwitterionic detergent C18-carboxypropylbetaine, diagnostic test, restriction fragment length polymorphism, diagnosis, feces, blood bone marrow, bursa Fabricii, smears, culture techniques.

## 1998

Bhowmik, M.K.; Cromie, R. **A comparative study on the mortality pattern of three species of ducks at the Jersey Wildlife Preservation Trust**. *Indian Journal of Animal Health*. 1998. 37 (2) 55-58.

**NAL call number:** SF1 I4

**Descriptors:** duck mortality, Meller's ducks, White-Winged Wood ducks, Madagascar ducks, Jersey Wildlife Preservation Trust, sex differences, septicaemia, pneumonia, avian tuberculosis, *Mycobacterium*, gangrenous dermatitis, yolk sac disease, bacterial agents, duck viral enteritis, parasitoses, toxicoses, neoplasms, egg peritonitis and ascites, UK.

Clippinger, T.L.; Bennett, R.A.; Newell, S.M. **Radiographic diagnosis - granulomatous pneumonia with intralesional acid-fast bacilli in an Amazon parrot (*Amazona aestiva*)**. *Veterinary Radiology and Ultrasound*. 1998. 39 (3) 181-184.

**NAL call number:** SF757.8 A4

**Descriptors:** granulomatous pneumonia, tuberculosis, laparoscopy, pathology, histopathology, biopsy, radiography, captive birds, case report, *Mycobacterium*, Amazon parrot.

Jantosovic, J.; Saly, J.; Kozak, M.; Kapitancik, B.; Magic, D. Jr. **Blood cell count at tuberculosis, cholera and salmonellosis in birds**. *Folia Veterinaria*. 1998. 42 (4) 201-205.

**NAL call number:** 41.8 F712

**Descriptors:** chickens, pigeons, blood cell counts, diagnosis, diagnostic techniques, hemoglobin, hematology, tuberculosis, erythrocytes, leukocytes, *Salmonella typhimurium*, *Pasturella multocida*, cholera, eosinophils, basophils.

Levkut, M.; Sevcikova, Z.; Ledecy, V.; Pauer, T. **Neobvykla manifestacia tuberkulozy u pstrosa dvojprsteho. [Unusual signs of tuberculosis in an ostrich.]** *Veterinarstvi*. 1998. 48 (9) 380. Note: In Slovakian with an English summary.

**NAL call number:** 41.8 V6439

**Descriptors:** case reports, pathology, zoo animals, tuberculosis, *Mycobacterium*, ostriches.

Morishita, T.Y.; Fullerton, A.T.; Lowenstine, L.J.; Gardner, I.A.; Brooks, D.L. **Morbidity and mortality in free-living**

**raptorial birds of Northern California: a retrospective study, 1983-1994.** *Journal of Avian Medicine and Surgery.* 1998. 12 (2) 78-81.

**NAL call number:** SF994 J6

**Descriptors:** owls, hawks, free-living raptors, mortality, morbidity, pathology, nutritional state, aspergillosis, *Escherichia* infections, diagnosis, clinical aspects, nutritional disorders, causes of death, trauma and injuries, tuberculosis, *Mycobacterium*, avian cholera, fractures, underlying diseases, California.

Prukner-Radovic, E.; Culjak, K.; Sostaric, B.; Mazija, H.; Sabocanec, R. **Generalised tuberculosis in pheasants at a commercial breeding farm.** *Zeitschrift fur Jagdwissenschaft.* 1998. 44 (1) 33-39. Note: In English with German and French summaries.

**NAL call number:** SK351 Z45

**Descriptors:** tuberculosis, farmed flock outbreaks, pheasants, *Mycobacterium* sp., *Mycobacterium avium* intracellular complex, pathology, zoonoses, disease control, diagnosis, bacterial diseases, carcass disposal, Croatia.

Washko, R.M.; Hoefer, H.; Kiehn, T.E.; Armstrong, D.; Dorsinville, G.; Frieden, T.R. ***Mycobacterium tuberculosis* infection in a green-winged macaw (*Ara chloroptera*): report with public health implications.** *Journal of Clinical Microbiology.* Apr 1998. 36 (4) 1101-1102. ISSN: 0095-1137

**NAL call number:** QR46.J6

**Descriptors:** *Psittaciformes*, tuberculosis, *Mycobacterium tuberculosis*, public health risks, *Ara chloroptera*.

## 1997

Gurel, A. ; Arun, S.S.; Yesildere, T. **Uc farkli evcil guvercin surusunde spontan tuberkulozis olgulari.**

**[Spontaneous tuberculosis in three different pigeon flocks.]** *Veteriner Fakultesi Dergisi.* 1997. 23 (1) 131-139.

Note: In Turkish with an English summary.

**NAL call number:** SF1 I78

**Descriptors:** pigeons, 3 flocks, *Mycobacterium avium*, tuberculosis, diagnosis, microscopy.

Quaranta, V.; Santagada, G.; Latorre, L.; Raimondi, P. **Grave episodio di tubercolosi aviare in un allevamento di fagiani (*Phasianus colchicus*). [Serious outbreak of tuberculosis on a pheasant (*Phasianus colchicus*) farm.]** *Acta Medica Veterinaria.* 1996, publ. 1997. 42 (3-4) 209-212. Note in Italian with an English summary.

**NAL call number:** 41.8 AC84

**Descriptors:** *Mycobacterium avium*, pheasants, *Phasianus colchicus*, pathology, outbreaks, tuberculosis, farmed flock, Italy.

Sun, L.; Kang, D.; Ge, X.; Sun, J.H.; Li, R.Z. **Application of PPA-ELISA for the detection of avian tuberculosis antibody in chicken serum.** *Chinese Journal of Animal Quarantine.* 1997. 14 (3) 11-13. Note: In Chinese.

**Descriptors:** *Mycobacterium avium*, antibodies, rabbit anti-chicken IgG immune serum, diagnostic test, PPA-ELISA, chickens, experimental infections, test sensitivity, test specificity and cost, SPF flocks.

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# Pets

## 2007

Chitty, J.; Hendricks, A. **Zoonotic skin disease in small animals.** *In Practice.* 2007; 29 (2): 92-97. ISSN: 0263-841X

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** SF601.I4

**Descriptors:** companion animals, cats, dogs, ferrets, rodents, rabbits, hedgehogs, zoonotic infections, risks to animal owners, causal agents, animals as disease reservoirs, cowpox virus, *Malassezia*, mites, *Mycobacterium*, *Siphonaptera*, *Staphylococcus*, chemotherapy, etiology, United Kingdom.

Girling, S.J.; Fraser, M.A. **Systemic mycobacteriosis in an inland bearded dragon (*Pogona vitticeps*).** *Veterinary Record.* 2007; 160 (15): 526-528. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/archive/>

**NAL Call Number:** 41.8 V641

**Descriptors:** bearded dragon lizard (*Pogona vitticeps*), fed dead and dying guppies (*Poecilia reticulata*), case report, clinical picture, behavior changes, lung and elbow aspirated, *Mycobacterium marinum* infection, Britain.

Moreno, B.; Aduriz, G.; Garrido, J.M.; Sevilla, I.; Juste, R.A. **Disseminated *Mycobacterium avium* subsp. *avium* infection in a pet Korean squirrel (*Sciurus vulgaris coreae*).** *Veterinary Pathology.* 2007 Jan; 44 (1): 123-125. ISSN: 0300-9858

**URL:** <http://vet.sagepub.com/>

**NAL Call Number:** 41.8 P27

**Abstract:** A disseminated *Mycobacterium avium* subsp. *avium* infection was diagnosed in a pet Korean squirrel. Grossly, multiple small nodules in the lung, liver, spleen, and skin were observed. Adrenal glands were very enlarged. The only tissue exhibiting necrosis and calcification was a very enlarged bronchial lymph node. The remaining lymph nodes were slightly enlarged. Moderate ascites was also observed. Microscopically, a disseminated granulomatous inflammation with numerous lymphocytes was seen. Acid-fast bacilli were detected in macrophages, in giant cells, free in the interstitium, and in some lymphatic vessels, both within cells and free in the lumen. *M. avium* subsp. *avium* was isolated and identified by polymerase chain reaction-restriction endonuclease analysis.

**Descriptors:** squirrels, *Sciurus*, pets, mycobacterial diseases, *Mycobacterium avium* subsp *avium*, infection, histopathology, inflammation, granuloma, pathogen identification, polymerase chain reaction, restriction fragment length polymorphism, disseminated infection.

Sieber-Ruckstuhl, N.S.; Sessions, J.K.; Sanchez, S.; Latimer, K.S.; Greene, C.E. **Long-term cure of disseminated *Mycobacterium avium* infection in a cat.** *Veterinary Record* (London). 2007 Jan 27; 160 (4): 131-132. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/>

**NAL Call Number:** 41.8 V641

**Descriptors:** 5-year-old cat, *Mycobacterium avium* infection, long term treatment, antibiotics, clindamycin, itraconazole, clarithromycin, clofazimine, doxycycline, enrofloxacin, combination drug therapy, adverse effects, cure, case report, Georgia, USA.

## 2006

Allison, N. ***Mycobacterium avium* infection in a dog.** *Veterinary Medicine.* 2006 Jan; 101 (1): 14. ISSN: 8750-7943

**NAL Call Number:** 41.8 M69

**Descriptors:** dogs, *Mycobacterium avium*, case studies.

Baral, R.M.; Metcalfe, S.S.; Krockenberger, M.B.; Catt, M.J.; Barrs, V.R.; McWhirter, C.; Hutson, C.A.; Wigney, D.I.; Martin, P.; Chen, S.C.A. **Disseminated *Mycobacterium avium* infection in young cats: over representation of Abyssinian cats.** *Journal of Feline Medicine and Surgery*. 2006 Feb; 8 (1): 23-44. ISSN: 1098-612X

**NAL Call Number:** SF985 .J68

**Descriptors:** kittens, young cats, cats, *Mycobacterium avium*, case study.

Baska, F.; Gonda, E. **Diszhalak virusos es bakteriumos megbetegedesei. [Viral and bacterial diseases of aquarium fish.]** *KisallatPraxis*. 2006; 7 (2): 42.50. ISSN: 1585-9142. Note: In Hungarian with an English summary.

**URL:** <http://www.kisallatpraxis.hu>

**Descriptors:** pet fish, diseases, *Aeromonas salmonicida*, *Flavobacterium*, lymphocystis virus, *Mycobacterium tuberculosis*, spring viraemia of carp virus recommended antibacterial treatments.

Buick, W. **TB in domestic species other than cattle and badgers.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 87-91. ISSN: 0269-5545

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** badgers (*Meles meles*), Camelidae, cats, cattle, dogs, ferrets, goats, sheep, horses, pigs, *Mycobacterium bovis*; clinical picture, susceptibility to pathogen.

Burton, G. **The cat with non-healing wounds.** *Problem Based Feline Medicine*. 2006: 1081-1106. ISBN: 0702024880; 9780702024887. Note: Published by Elsevier.

**NAL Call Number:** SF985.P69 2006

**Descriptors:** cats, cat diseases, metabolic diseases, bacterial infections, birth defects, cancers, drugs, traumas, treatments, clinic pictures, zoonotic infections, Acremonium, Actinomyces, Blastomyces, Coccidioides, *Cochliobolus geniculatus*, *Cryptococcus deuteromycotina*, felid herpesviruses, *Histoplasma*, *Madurella grisea*, *Microsporum canis*, *Mycobacterium*, *Mycobacterium bovis*, *Nocardia*, Orthopoxvirus, *Sporothrix*, *Staphylococcus*, *Yersinia pestis*, Arthrodermataceae, coccidiomycosis, eosinophilic granuloma complex, *Epidermolysis bullosa*, European blastomycosis, feline herpesvirus.

Clark, J.L. **Common bacterial pathogens.** *Veterinary Technicians and Practice Managers Proceedings of the North American Veterinary Conference, Volume 20, Orlando, Florida, USA, 7-11 2006*. 2006; 26-28

**URL:** <http://www.tnavc.org>

**Descriptors:** cats, dogs, bacterial lung diseases, clinical picture, *Bordetella bronchiseptica*, *Escherichia coli*, *Klebsiella*, *Mycobacterium*, *Pasteurella multocida*, *Proteus*, *Staphylococcus intermedius*.

Cornegliani, L.; Fondevila, D.; Vercelli, A.; Mantero, G.; Fondati, A. **PCR technique detection of *Leishmania* spp. but not *Mycobacterium* spp. in canine cutaneous 'sterile' pyogranuloma.** *Veterinary Dermatology*. 2005 Aug; 16(4): 233-238. ISSN: 0959-4493

**NAL Call Number** SF901.V47

**Abstract:** Cutaneous 'sterile' pyogranuloma/granuloma syndrome (SPGS) is an uncommon canine skin disorder of unknown aetiopathogenesis. Histopathological findings and failure to demonstrate an aetiological agent are suggestive of this syndrome. Nevertheless, it has been hypothesized that SPGS may be related to an immune response against persistent endogenous or exogenous antigens. The presence of *Leishmania* and *Mycobacterium* organisms was investigated by polymerase chain reaction (PCR) techniques in 46 canine skin samples histopathologically diagnosed as SPGS. Concomitantly, an immunohistochemical technique for *Leishmania* detection was applied on the same samples and the results were compared with those from PCR. The PCR technique yielded positive results for *Leishmania* spp. in 21 out of 46 skin samples. The results of immunohistochemical techniques were identical to those obtained by PCR. The PCR technique gave negative results for *Mycobacterium* spp. in all the samples examined. These results suggest the importance of looking for *Leishmania* spp. in skin biopsies with histopathological findings consistent with the diagnosis of SPGS.

**Descriptors:** dogs, dog diseases, PCR, polymerase chain reaction, disease detection, *Leishmania*, leishmaniasis, *Mycobacterium*, mycobacterial diseases, skin diseases, granuloma, etiology, pathogenesis, immune response, immunohistochemistry, inflammation, sterile pyogranuloma granuloma syndrome.

Davies, Jennifer L.; Sibley, Jennifer A.; Myers, Sherry; Clark, Edward G.; Appleyard, Greg D. **Histological and genotypical characterization of feline cutaneous mycobacteriosis: a retrospective study of formalin-fixed**

**paraffin-embedded tissues.** *Veterinary Dermatology*. 2006 June; 17 (3): 155-162. ISSN: 0959-4493

**URL:** <http://dx.doi.org/10.1111/j.1365-3164.2006.00513.x>

**NAL Call Number:** SF901.V47

**Abstract:** Twenty-nine cases presumptively diagnosed as feline cutaneous mycobacteriosis were evaluated microscopically with haematoxylin and eosin and modified Fite's stained sections using archived formalin-fixed paraffin-embedded tissue specimens. Lesions were characterized histologically as feline leprosy (7 cases lepromatous and 16 cases tuberculoid) or atypical mycobacteriosis (3 cases); three cases did not fit these criteria and were classified as 'miscellaneous'. Actinomycetales-specific polymerase chain reaction (PCR) of variable regions 1, 2 and 3 of the 16S ribosomal RNA (rRNA) gene and subsequent sequence analysis of the amplicons were performed to identify the species of mycobacteria associated with each case. Together, this study identified 10 different Actinomycetales organisms with greater than 98% nucleotide sequence identity to named species, nine were of the genus *Mycobacterium* and eight were associated with feline leprosy (both lepromatous and tuberculoid). Based on this study, we conclude that feline cutaneous mycobacteriosis should be considered as a syndrome with varied clinical and histological presentations associated with a variety of different *Mycobacterium* species, organisms other than *Mycobacterium* sp. may be associated with feline cutaneous mycobacteriosis lesions, and molecular diagnostic techniques can be an important tool for identifying agents associated with lesions of feline cutaneous mycobacteriosis.

**Descriptors:** feline cutaneous mycobacteriosis, formaline embedded tissues, feline leprosy, varied clinical and histological presentation, different *Mycobacterium* species, molecular techniques, possible multi-bacterial pathogens.

Dean, R.; Gunn-Moore, D.; Shaw, S.; Harvey, A. **Bovine tuberculosis in cats.** *Veterinary Record* (London). 2006; 158 (12): 419-420. ISSN: 0042-4900.

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** cats, *Mycobacterium bovis*, companion animal disease vector, disease prevalence, disease transmission, epidemiology, tuberculosis.

Ebrecht, D.; Muller, E. **A nyul zoonosisai. [Zoonoses in rabbits.]** *Magyar Allatorvosok Lapja*. 2006; 128 (2): 114-119. ISSN: 0025-004X. Note: In Hungarian.

**URL:** <http://www.univet.hu/mal/>

**Descriptors:** rabbits, zoonotic diseases: *Alternaria alternate*, *Aspergillus*, *Bordetella bronchiseptica*, *Campylobacter coli*, *Campylobacter jejuni*, *Candida*, *Cheyletiella parasitivorax*, *Chirodiscooides caviae*, *Encephalitozoon cuniculi*, *Francisella tularensis*, *Leporacarus gibbus*, *Listeria monocytogenes*, *Malassezia pachydermatis*, *Microsporium canis*, *Microsporium gypseum*, *Mucor*, *Mycobacterium*, *Otodectes cynotis*, *Pasteurella multocida*, *Salmonella enteritidis*, *Salmonella typhimurium*, *Scopulariopsis brevicaulis*, *Trichophyton mentagrophytes*, *Yersinia pseudotuberculosis*.

Ellis, M.D.; Davies, S.; McCandlish, I.A.P.; Monies, R.; Jahans, K.; de la Rua Domenech, R. ***Mycobacterium bovis* infection in a dog.** *Veterinary Record*. 2006 July 8; 159 (2): 46-48. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/>

**NAL Call Number:** 41.8 V641

**Descriptors:** dogs, *Mycobacterium bovis*, case study, pathology.

Harrenstien, L.A.; Finnegan, M.V.; Woodford, N.L.; Mansfield, K.G.; Waters, W.R.; Bannantine, J.P.; Paustian, M.L.; Garner, M.M.; Bakke, A.C.; Peloquin, C.A.; Phillips, T.M. ***Mycobacterium avium* in pygmy rabbits (*Brachylagus idahoensis*): 28 cases.** *Journal of Zoo and Wildlife Medicine*. 2006; 37 (4): 498-512. ISSN: 1042-7260

**URL:** <http://www.bioone.org/perlserv/?request=get-archive&issn=1042-7260&ct=1>

**NAL Call Number:** SF601.J6

**Descriptors:** pigmy rabbit (*Brachylagus idahoensis*), endangered animal, mycobacteriosis, *Mycobacterium avium*, mortality levels, clinical course, prevention recommendations, compromised cell-mediated immunity, chemotherapy, Washington state, Columbia basin, USA.

Ivana, S. **Infectii bacteriene cutanate profunde la caine si pisica. [The deep skin bacterial infections in dog and cat.]** *Revista Romana de Medicina Veterinara*. 2006; 16 (1): 49-62. ISSN: 1220-3173. Note: In Romanian with an English summary.

**Descriptors:** cats, dogs, bacterial infections, *Actinomyces hordeovulneris*, *Mycobacterium fortuitum*, *Mycobacterium tuberculosis*, *Nocardia asteroides*, *Rhodococcus equi*, skin lesions, pathophysiology.

Larsson, C.E.; Delayte, E.H.; Balda, A.C.; Michalany, N.S.; Pinheiro, S.R.; Otsuka, M.; Roxo, E. **Dermatite micobacteriana atípica em gato: relato de caso. [Atypical mycobacterial dermatitis in cat: a case report.]** *Arquivo Brasileiro de Medicina Veterinária e Zootecnia*. 2006; 58 (6): 1092-1098. ISSN: 0102-0935. Note: In Portuguese with an English summary.

**URL:** [www.journal.vet.ufmg.br](http://www.journal.vet.ufmg.br)

**NAL Call Number:** SF604.A76

**Descriptors:** female mixed breed cat, case report, *Mycobacterium fortuitum peregrinum* complex, dermatitis, clinical picture of ulcers, erosions, intradermal tests, histopathological evidence, bacterial culture and biochemical tests, rifampin, rifamycin amp, triclosan, Brazil.

Lewicki, J. **Mykobakteriozy kotow: uwarunkowania i zasady chemioterapii. [Feline mycobacterioses: conditions and principles of chemotherapy.]** *Zycie Weterynaryjne*. 2006; 81 (8): 548-558. ISSN: 0137-6810. Note: In Polish with and English summary.

**URL:** [http://www.vetpol.org.pl/index.php?option=com\\_content&view=article&id=59&Itemid=61](http://www.vetpol.org.pl/index.php?option=com_content&view=article&id=59&Itemid=61)

**NAL Call Number:** SF604.Z9

**Descriptors:** cats, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, *Mycobacterium smegmatis*, *Mycobacterium fortuitum*, infectious disease, antibiotic treatment, drug regimens, rifampin-; rifamycin amp, clarithromycin, clarithromycin and clofazimine, doxycycline, drug combination, efficacy, oral dosing.

Monies, B.; Rua, R. de la; Jahans, K. **Bovine tuberculosis in cats.** *Veterinary Record* (London). 2006; 158 (14): 490-491. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** cats, *Mycobacterium bovis*, bovine tuberculosis, disease vectors, zoonotic diseases, public health concerns, diagnosis and monitoring in farmed and companion animals,

Monies, B.; Jahans, K.; Rua, R. de la. **Bovine tuberculosis in cats.** *Veterinary Record* (London). 2006; 158(7): 245-246. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** rural cats, *Mycobacterium bovis* in about 12% of cats tested, case reports, clinical aspects, disease transmission, England, Wales.

More, S.J.; Collins, J.D.; Gormley, E.; Good, M.; Skuce, R.A.; Pollock, J.M. **Proceedings of the 4th International Conference on *Mycobacterium bovis*, Dublin, Ireland, 22-26 August 2005.** *Veterinary Microbiology*. 2006; 112 (2/4): 89-391. ISSN: 0378-1135. Note: Special issue: S.J. More; J.D. Collins; E. Gormley; M. Good; R.A. Skuce; J.M. Pollock (editors). *Proceedings of the 4th International Conference on Mycobacterium bovis, Dublin, Ireland, 22-26 August 2005*.

**Descriptors:** humans, livestock domestic animals, cattle, wild animals, *Mycobacterium bovis*, diagnosis, epidemiology, zoonotic disease prevalence, pathogenesis, diagnosis and control, vaccination, animal reservoirs, vaccine development.

O' Toole, D.; Tharp, S.; Thomsen, B.V.; Tan, E.; Payeur, J.B. **Fatal mycobacteriosis with hepatosplenomegaly in a young dog due to *Mycobacterium avium*.** *Journal of Veterinary Diagnostic Investigation*. 2005 Mar; 17 (2): 200-204. ISSN: 1040-6387

**NAL Call Number:** SF774.J68

**Abstract:** Cases of disseminated *Mycobacterium avium* infections in dogs are rare because it appears that the species is innately resistant to infection. A 2-year-old, castrated, 5 kg Shih Tzu-Poodle-cross developed anemia, abdominal pain, lethargy, and splenomegaly. Histological examination of surgically removed spleen indicated marked granulomatous splenitis with myriad intracytoplasmic acid-fast bacterial rods. Ultrastructural examination revealed the presence of 3-4-micrometer-long mycobacteria in phagolysosomes of epithelioid macrophages. Tissue extract of lightly fixed spleen was positive for *M. avium* 16S ribosomal RNA and negative for *M. tuberculosis* complex IS6110 DNA by polymerase chain reaction testing. Anemia was associated with the presence of mycobacteria-infected macrophages in bone marrow. The animal's condition deteriorated, and euthanasia was performed after a clinical course of 2 months. The principal morphological findings at necropsy were severe diffuse granulomatous hepatitis, enteric lymphadenomegaly, and segmental granulomatous enteritis with intralesional mycobacteria present. *Mycobacterium avium* was cultured

from enteric lymph nodes sampled at necropsy. The source of infection was not established but was presumed to be environmental with an enteric portal of entry.

**Descriptors:** crossbreed dog, young male animal, case study, dog diseases, mycobacterial diseases, *Mycobacterium avium*, splenomegaly, hepatitis, dog breeds, Shih-Tzu (dog-breed), poodle, crossbred, anemia (disease), pain, physical activity, symptoms, epithelial cells, macrophages, bone marrow cells, lymphadenitis, bacterial enteritis, hepatosplenomegaly.

Rosenthal, K.L. **Aspergillus and mycobacteria diagnostics.** *Small Animal and Exotics. Proceedings of the North American Veterinary Conference, Volume 20, Orlando, Florida, USA, 7-11 January, 2006.* 2006: 1580-1582

**URL:** <http://www.tnavc.org>

**Descriptors:** pet animals, *Aspergillus fumigatus*, *Mycobacterium*, *Mycobacterium avium* complex, *Hyphomycetes*, clinical picture, cell count, death rate.

Rosenthal, K.L. **Microbiology: revisiting the gram stain and culture.** *Small Animal and Exotics Proceedings of the North American Veterinary Conference, Volume 20, Orlando, Florida, USA, 7-11 January, 2006.* 2006: 1575-1577

**URL:** <http://www.tnavc.org>

**Descriptors:** pet birds, bacterial infections, *Enterococcus*, *Escherichia coli*, *Klebsiella*, *Mycobacterium*, *Mycoplasma*, *Proteus*, *Pseudomonas*, *Staphylococcus aureus*, *Chlamydomydia*, Gram stain, culture methods.

Saunders, G.K.; Thomsen, B.V. **Lymphoma and *Mycobacterium avium* infection in a ferret (*Mustela putorius furo*).** *Journal of Veterinary Diagnostic Investigation.* 2006 Sept; 18 (5): 513-515. ISSN: 1040-6387

**NAL Call Number:** SF774.J68

**Descriptors:** ferret, case study, *Mycobacterium avium*, lymphoma, diagnosis, clinical picture.

## 2005

Bhat, M.N.; Yathiraj, S.; Ravi-Raidurg; Sudha, G.; Murthy, G.S. **Tuberculosis in a sloth bear (*Melursus ursinus*) - a case report.** *Indian Journal of Veterinary Medicine.* 2005; 25 (2): 138. ISSN: 0970-051X

**Descriptors:** captive 10 year old male, sloth bear (*Melursus ursinus*), street animal performer, case report, clinical picture, decreased appetite, progressive weight loss, poor body condition, post mortem tissue collection, lung nodules, caseous liquefied material, liver, lymph nodes, calcification, acid fast organisms, pulmonary tuberculosis, India.

Cornegliani, L.; Fondevila, D.; Vercelli, A.; Mantero, G.; Fondati, A. **PCR technique detection of *Leishmania* spp. but not *Mycobacterium* spp. in canine cutaneous 'sterile' pyogranuloma.** *Veterinary Dermatology.* 2005 Aug; 16(4): 233-238. ISSN: 0959-4493

**NAL Call Number** SF901.V47

**Abstract:** Cutaneous 'sterile' pyogranuloma/granuloma syndrome (SPGS) is an uncommon canine skin disorder of unknown aetiopathogenesis. Histopathological findings and failure to demonstrate an aetiological agent are suggestive of this syndrome. Nevertheless, it has been hypothesized that SPGS may be related to an immune response against persistent endogenous or exogenous antigens. The presence of *Leishmania* and *Mycobacterium* organisms was investigated by polymerase chain reaction (PCR) techniques in 46 canine skin samples histopathologically diagnosed as SPGS. Concomitantly, an immunohistochemical technique for *Leishmania* detection was applied on the same samples and the results were compared with those from PCR. The PCR technique yielded positive results for *Leishmania* spp. in 21 out of 46 skin samples. The results of immunohistochemical techniques were identical to those obtained by PCR. The PCR technique gave negative results for *Mycobacterium* spp. in all the samples examined. These results suggest the importance of looking for *Leishmania* spp. in skin biopsies with histopathological findings consistent with the diagnosis of SPGS.

**Descriptors:** dogs, dog diseases, PCR, polymerase chain reaction, disease detection, *Leishmania*, leishmaniasis, *Mycobacterium*, mycobacterial diseases, skin diseases, granuloma, etiology, pathogenesis, immune response, immunohistochemistry, inflammation, sterile pyogranuloma granuloma syndrome.

Ebani, V.; Fratini, F. **Bacterial zoonoses among domestic reptiles.** *Annali della Facolta di Medicina Veterinaria di Pisa.* 2005; 58: 85-91. ISSN: 0365-4729. Note: In English with an Italian summary.

**Descriptors:** lizards, snakes, turtles, exotic animals as pets, opportunistic pathogens, viruses, fungi, parasites, bacterial

pathogens, public health concerns, zoonotic diseases, *Aeromonas*, *Mycobacterium*, *Pseudomonas*, *Salmonella*.

Garner, M.M. **Common and emerging diseases of reptiles: bacterial.** *Small Animal and Exotics Proceedings of the North American Veterinary Conference, Volume 19, Orlando, Florida, USA, 8-12 January, 2005.* 2005; 1271-1272

**URL:** <http://www.navc.org>

**Descriptors:** reptiles, exotic pets, common bacterial diseases, emerging bacterial diseases, clinical picture, *Chlamydia*, *Klebsiella*, *Mycobacterium*, reptiles.

Hewes, C.A.; Schneider, R.K.; Baszler, T.V.; Oaks, J.L. **Septic arthritis and granulomatous synovitis caused by infection with *Mycobacterium avium* complex in a horse.** *Journal of the American Veterinary Medical Association.* 2005 June 15; 226 (12): 2035-2038. ISSN: 0003-1488

**NAL Call Number:** 41.8 Am3

**Descriptors:** horses, arthritis, sepsis (infection), horse diseases, synovitis, *Mycobacterium avium* complex, mycobacterial diseases, lameness, case studies, pain, granulomatous-synovitis

Jahans, K.L.; Worth, D.; Brown, J.; Monies, R.J. **Detection of bovine tuberculosis in spill-over hosts.** *Research in Veterinary Science.* 2005; 78 (Suppl. A): 23-24. ISSN: 0034-5288. Note: Meeting abstract. 59th Annual Conference of the Association for Veterinary Teaching and Research Work, Scarborough, England; March 21 -23, 2005

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Descriptors:** *Mycobacterium bovis*, cattle, buffalo, bison, sheep, goats, dogs, deer, cats, badgers, pigs, domestic and wildlife species, spill over hosts, end hosts, animal pathogen reservoirs, maintenance hosts.

Lunn, J.A.; Martin, P.; Zaki, S.; Malik, R. **Pneumonia due to *Mycobacterium abscessus* in two domestic ferrets (*Mustelo putorius furo*).** *Australian Veterinary Journal.* 2005 Sept; 83 (9): 542-546. ISSN: 0005-0423

**NAL Call Number:** 41.8 AU72

**Descriptors:** ferrets, *Mycobacterium abscessus*, bacterial pneumonia, mycoplasmosis, lavage, clarithromycin, case study, antibiotics, animal diseases, drug therapy, disease detection, pathogenesis.

Shaw, S.E. **Keynote: New and emerging diseases of small companion animals.** *Research in Veterinary Science.* 2005; 78 (Suppl. A): 25. ISSN: 0034-5288. Note: 59th Annual Conference of the Association for Veterinary Teaching and Research Work, Scarborough, England; March 21 -23, 2005

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623070/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623070/description#description)

**NAL Call Number:** 41.8 R312

**Descriptors:** dogs, fox, *Mycobacterium bovis*, *Mycobacterium microti*, *Mycobacterium avium* *intracellulare*, *Ehrlichia*, companion animals, animal diseases, zoonotic diseases.

Twomey, L.N.; Wuerz, J.A.; Alleman, A.R. **A "down under" lesion on the muzzle of a dog.** *Veterinary Clinical Pathology.* 2005; 34 (2): 161-163. ISSN: 0275-6382

**NAL Call Number:** SF601.A54

**Descriptors:** male Labrador Retriever dog, dog diseases, facial lesions (animal), case study, *Mycobacterium*, mycobacterial diseases, disease diagnosis, disease detection, remission, granuloma, canine leproid granuloma syndrome.

Verde, M. **Zoonotic dermatoses in cats.** *Small Animal and Exotics Proceedings of the North American Veterinary Conference, Volume 19, Orlando, Florida, USA, 8-12 January, 2005.* Published by the Eastern States Veterinary Association. Gainesville. 2005; 292-294

**URL:** <http://www.navc.org>

**Descriptors:** cats, humans, zoonotic skin diseases, dermatitis, diagnosis, disease transmission, *Bartonella henselae*, *Blastomyces dermatitidis*, *Ctenocephalides felis felis*, *Microsporum canis*, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, *Notoedres cati*, *Otodectes cynotis*, Poxviridae, *Sporothrix schenckii*.

Bauer, Natali B.; O'Neill, Emma; Sheahan, Brian J.; Cassidy, Joseph; McAllister, Hester. **Calcospherite-like bodies and caseous necrosis in tracheal mucus from a dog with tuberculosis.** *Veterinary Clinical Pathology*. 2004; 33 (3): 168-172. ISSN: 0275-6382

**Descriptors:** Wirehaired Fox Terrier, case study, symptoms, chronic cough, dilated, collapsed bronchus, viscous white mucus, calcospherites and granular caseous debris, bacteria suggestive of *Mycobacterium*, many organs showed granulomas, histology, culture positive for *Mycobacterium bovis*, disease similar to human tuberculosis.

Deforges, L.; Boulouis, H.J.; Thibaud, J.L.; Boulouha, L.; Sougakoff, W.; Blot, S.; Hewinson, G.; Truffot-Pernot, C.; Haddad, N. **First isolation of *Mycobacterium microti* (Llama-type) from a dog.** *Veterinary Microbiology*. 2004 Nov 15; 103 (3-4): 249-253. ISSN: 0378-1135

**Abstract:** We report the first isolation of *Mycobacterium microti* from a dog with lesions of acute peritonitis. The isolate was demonstrated to be *M. microti* of Llama-Type by spoligotyping. Epidemiological implications of the isolation of this possibly zoonotic agent from a dog are discussed.

**NAL Call Number:** SF601.V44

**Descriptors:** dog, *Mycobacterium microti*, dog diseases, mycobacterial diseases, lesions, peritonitis, llamas, zoonoses, epidemiology, pathogen host-range, case study.

Erwin, Paul C.; Bemis, David A.; Mawby, Dianne I.; McCombs, Scott B.; Sheeler, Lorinda L.; Himelright, Inga M.; Halford, Sandy K.; Diem, Lois; Metchock, Beverly; Jones, Timothy F.; Schilling, Melisse G.; Thomsen, Bruce V. ***Mycobacterium tuberculosis* transmission from human to canine.** *Emerging Infectious Diseases*. 2004; 10 (12): 2258-2260. ISSN: 1080-6040

**URL:** <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?linkbar=plain&db=journals&term=1080-6040>

**NAL Call Number:** RA648.5.E46

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, dogs, humans, case study, zoonotic disease, transfer from human to dog, drug therapy, Tennessee, USA.

Gunn-Moore, D. **Investigating feline tuberculosis.** *Veterinary Times*. 2004; 34 (13): 10. ISSN: 1352-9374

**Descriptors:** cats, cattle, humans, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium microti*, disease prevalence, disease transmission between species, epidemiology, risk factors, disease spread, zoonoses.

Hackendahl, N. C.; Mawby, D.I.; Bemis, D.A.; Beazley, S.L. **Putative transmission of *Mycobacterium tuberculosis* infection from a human to a dog.** *Journal of the American Veterinary Medical Association*. 2004 Nov 15; 225 (10): 1573-1577. ISSN: 0003-1488

**NAL Call Number:** 41.8 Am3

**Descriptors:** humans, male Yorkshire terrier dog, clinical picture, anorexia, vomiting, symptoms, cough, disease diagnosis, dog diseases, *Mycobacterium tuberculosis*, tuberculosis, disease transmitted from human to dog, case study.

Knippel, A.; Hetzel, U.; Baumgartner, W. **Disseminated *Mycobacterium avium intracellulare* infection in a Persian cat.** *Journal of Veterinary Medicine Series B*. 2004 Dec; 51 (10): 464-466. ISSN: 0931-1793

**NAL Call Number:** 41.8 Z52

**Descriptors:** cats, cat diseases, Persian breed, bacterial infection, *Mycobacterium avium* complex, mycobacterial diseases, disease diagnosis, disease detection, symptoms, histopathology, lymph nodes, mesentery, gastrointestinal system, case study.

Malik, R.; Shaw, S.E.; Griffin, C.; Stanley, B.; Burrows, A.K.; Bryden, S.L.; Titmarsh, J.; Stutsel, M.J.; Carter, S.A.; Warner, A. **Infections of the subcutis and skin of dogs caused by rapidly growing mycobacteria.** *Journal of Small Animal Practice*. 2004 Oct; 45 (10): 485-494. ISSN: 0022-4510

**NAL Call Number:** 41.8 J8292

**Descriptors:** dogs, dog diseases, cats, cat diseases, skin diseases, mycobacterial diseases, *Mycobacterium fortuitum*, *Mycobacterium smegmatis*, animal age, gender, obesity, animal injuries, hyperadrenocorticism, pain, lameness, fever, inflammation, disease diagnosis, symptoms, antimicrobial agents, drug injection, oral administration, relapse, case studies.

Moretti, L. d' A.; Pinheiro, S.R.; Paes, A.C. **Uma revisao sobre a tuberculose em caes e gatos. [A review concerning tuberculosis in dogs and cats.]** *Clinica Veterinaria*. 2004; 9 (48): 54-62. ISSN: 1413-571X. Note: In Portuguese with an English summary.

**URL:** <http://www.editoraguara.com.br/cv/atual.htm>

**Descriptors:** humans, cats, dogs, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, etiology, histopathology, pathogenesis, clinical aspects, diagnosis, epidemiology, disease control, disease resistance, drug therapy, prophylaxis, literature reviews, zoonoses.

Yei, Ku Song; Wu, Yeong Huey; Liao, Ming Huei; Liu, Hung Jen; Chang, Ching Dong; Shiau, Chung Jung.

**Difficulties in eradication of tuberculosis infected cows from the infected dairy herds in Taiwan.** *Taiwan Veterinary Journal*. 2004; 30 (1): 56-63. ISSN: 1682-6485. Note: In Chinese.

**Descriptors:** cattle, *Mycobacterium bovis*, diagnostic testing, intra-dermal tuberculin test (ITT), gamma interferon test (IFN-gamma test), duplex polymerase chain reaction (duplex PCR), blood, nasal mucus samples, milk samples, difficulty eliminating disease, disease reservoirs on the farms, humans, dogs, cats, rats, nasal discharges and raw milk exposed calves, Taiwan.

## 2003

Kipar, A.; Schiller, I.; Baumgartner, W. **Immunopathological studies on feline cutaneous and (muco)cutaneous mycobacteriosis.** *Veterinary Immunology and Immunopathology*. 2003, 91 (3-4) 169-182. ISSN: 0165-2427

**NAL Call Number:** SF757.2.V38

**Descriptors:** cats, *Mycobacterium avium*, *Mycobacterium tuberculosis*, antigens, B lymphocytes, cytokines, immunopathology, lymphocytes, infected macrophages, monocytes, T lymphocytes, low virulence, induction of cytokine and iNOS expression, calprotectin, bacilli confinement in lesions.

Reid, S.W.J. (ed); Menzies, F.D. *Society for Veterinary Epidemiology and Preventive Medicine. Proceedings of a meeting held at University of Warwick, England, 31st-March 2<sup>nd</sup> April 2003*. 2003, 277 pp. Note: The proceedings has 21 articles on a variety of topics related to animal diseases.

**Descriptors:** cattle, dogs, horses, *Mycobacterium bovis*, epidemiology of bovine tuberculosis, injuries, FMD, heart diseases, mastitis, satellite imagery, vaccination.

## 2002

Jackson, R. **Veterinary epidemiology in New Zealand: a 50-year perspective.** *New Zealand Veterinary Journal*. 2002. 50 (3) Supplement, 13-16.

**NAL call number:** 41.8 N483

**Descriptors:** animal diseases, computer software, epidemiology, pets, tuberculosis, cattle, pigs New Zealand.

Kaneene, J.B.; Bruning-Fann, C.S.; Dunn, J.; Mullaney, T.P.; Berry, D.; Massey, J.P.; Thoen, C.O.; Halstead, S.; Schwartz, K. **Epidemiologic investigation of *Mycobacterium bovis* in a population of cats.** *American Journal of Veterinary Research*. 2002, 63 (11) 1507-1511. ISSN: 0002-9645

**NAL call number:** 41.8 Am3A

**Descriptors:** cats, *Mycobacterium bovis* infection, tuberculin skin test for diagnosis, ELISA diagnostic techniques, disease transmission, offspring of an infected mother, disease source proposed as contaminated wildlife carcasses, Michigan.

## 2001

Delahay, R.J.; Cheeseman, C.L.; Clifton-Hadley, R.S.; Ellner, J.J. (ed.); Brennan, P.J. (ed.); Young, D. **Wildlife disease reservoirs: the epidemiology of *Mycobacterium bovis* infection in the European badger (*Meles meles*) and other British mammals.** *Tuberculosis*. 2001. 81 (1-2) 43-49. Note: Third international conference on *Mycobacterium bovis*, *M. bovis* 2000, Cambridge, UK, 13-16 August, 2000.

**Descriptors:** animal behavior, disease distribution, disease prevalence, disease transmission, epidemiology, reservoir hosts, wildlife, cats, deer, cattle, foxes, ferrets, badgers, mink, rats, *Rattus norvegicus*, *Talpa europaea*, Great Britain, New Zealand.

LeJeune, J.T.; Hancock, D.D. **Public health concerns associated with feeding raw meat diets to dogs.** *Journal of the American Veterinary Medical Association*. 2001. 219 (9) 1222-1225. ISSN: 0003-1488

**NAL call number:** 41.8 AM3

**Descriptors:** health risks, sources of contamination, foodborne bacterial agents, viruses, parasites, Ascarididae, Aujeszky virus, *Bacillus anthracis*, *Bacillus cereus*, *Burkholderia mallei*, *Campylobacter jejuni*, *Clostridium botulinum*, *Clostridium perfringens*, *Diocotophyme renale*, *Diphyllbothrium latum*, pet animals, dogs, *Echinococcus*, *Escherichia coli*, *Listeria monocytogenes*, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, *Nanophyetus salmincola*, *Neospora caninum*, *Opisthorchis*, *Salmonella*, *Sarcocystis*, *Staphylococcus aureus*, *Taenia*, *Toxoplasma gondii*, *Trichinella spiralis*, *Yersinia enterocolitica*.

Langan, J.N.; Adams, W.H.; Patton, S.; Lindermann, K.; Schumacher, J. **Radiation and intralesional chemotherapy for a fibrosarcoma in a boa constrictor, *Boa constrictor orton*.** *Journal of Herpetological Medicine and Surgery*. 2001; 11 (1): 4-8. ISSN: 1529-9651

**Descriptors:** boa constrictor (*Boa constrictor orton*), fibrosarcoma, case study, clinical picture, treatment, *Mycobacterium chelonae*.

Thorel, M.F.; Huchzermeyer, H.F.; Michel, A.L. ***Mycobacterium avium* and *Mycobacterium intracellulare* infection in mammals.** *Revue Scientifique et Technique Office International des Epizooties*. 2001. 20 (1) 204-218. Note: In English with French and Spanish summaries.

**NAL call number:** SF781 R4

**Descriptors:** domestic animals, immunosuppression, post slaughter survey, soil microbes, tuberculosis, water, cats, dogs, small mammals, wild animals, wild birds, zoonotic diseases.

## 2000

Blancou, J; Blancou, J. *Histoire de la surveillance et du controle des maladies animals transmissibles. [History of the monitoring and the control of transmissible animal diseases.]* Office International des Epizooties; Paris; France. 2000. xiv + 366 pp. Note: In French.

**Descriptors:** history, symptoms, lesions, etiology, pathology, epidemiology, preventive measures, treatment, legislative aspects of transmissible animal diseases, sheep pox, foot and mouth disease, anthrax, distemper, glanders, contagious pleuropneumonia, rinderpest, African horse sickness, rabies, tuberculosis, tetanus, cysticercosis, dourine, fascioliasis, mange and scabies, endoparasites, cattle, dogs, goat, horse, sheep, swine, wild animals.

Hartmann, K.; Gerle, K.; Hirschberger, J.; Reischl, U.; Hermanns, W. **Lungentuberkulose bei einer Katze. [Pulmonary tuberculosis in a cat.]** *Tierärztliche Praxis*. 2000. 28 (3) 197-202. Note: In German with an English summary.

**NAL call number:** SF603 V433

**Descriptors:** *Mycobacterium tuberculosis*, tuberculosis, cat, case reports, diagnosis, lung disease, respiratory diseases, Germany.

Monies, R.J.; Cranwell, M.P.; Palmer, N.; Inwald, J.; Hewinson, R.G.; Rule, B. **Bovine tuberculosis in domestic cats.** *Veterinary Record*. Apr 1, 2000. 146 (14) 407-408. ISSN: 0042-4900

**NAL call number:** 41.8 V641

**Descriptors:** cats, tuberculosis, spoligotyping, *Mycobacterium bovis*, outbreaks, biochemical techniques, *Meles meles*, Great Britain.

Phalen, D.N.; Bonagura, J.D. **Avian mycobacteriosis.** *Kirk's Current Veterinary Therapy XIII: Small Animal Practice*. W.B. Saunders, Philadelphia, USA 2000. p. 1116-1118.

**NAL call number:** SF745 K57

**Descriptors:** epidemiology, pathogenesis, diagnosis, zoonoses, treatment, pets birds, *Mycobacterium avium*, *Mycobacterium tuberculosis*.

Salt, S.; Ozbilgin, S.; Ozmen, O.; Misirlioglu, D. **Bazi yabani ve kafes kuslarinda gozlenen klinik ve patolojik bulgular. [Clinical and pathological findings of some wild and captive birds.]** *Veteriner Fakultesi Dergisi*. 2000. 19 (1-2) 127-132. Note: In Turkish with an English summary.

**NAL call number:** SF1 I78

**Descriptors:** bird diseases, turkeys, budgerigars, pigeons, parrots, canaries, seagull, heron, peacock, various pathologies including tuberculosis, cysts pathological, encephalitis, enteritis, hemorrhage, hepatitis, hyperkeratosis, mycoses, neoplasms, pneumonia, tuberculosis, *Mycobacterium*.

UK, MAFF. **Animal Health 2000. Report of the Chief Veterinary Officer. 2000.** Ministry of Agriculture, Fisheries and Food (MAFF), London, UK

**Descriptors:** zoonotic disease, public health, disease prevention and control, animal welfare, BSE, tuberculosis, *Mycobacterium*, pets, livestock, transport, slaughter, UK.

## 1999

Anonymus. **Tuberculosis.** *Journal of Small Animal Practice.* March 1999, 40 (3) 145-147. ISSN: 0022-4510. Note: This article was prepared by the British Small Animal Veterinary Association's Scientific Committee.

**NAL call number:** 41.8 J8292

**Descriptors:** dogs, cats, man, *Mycobacterium tuberculosis*, pathogenesis, clinical aspects, diagnosis, zoonoses.

Barlow, A.M; Mitchell, K.A.; Visram, K.H. **Bovine tuberculosis in llama (*Lama glama*) in the UK.** *Veterinary Record.* Nov 27, 1999. 145 (22) 639-640. ISSN: 0042-4900

**NAL call number:** 41.8 V641

**Descriptors:** llamas, pets, *Mycobacterium bovis*, tuberculosis, diagnosis, disease transmission, cattle, lung lesions, lymph nodes, isolation, susceptibility, UK.

Fernandez, F.; Morici, E. **Tuberculosis felina por *Mycobacterium bovis*: comunicacion de dos casos. [Feline tuberculosis due to *Mycobacterium bovis*: report of 2 cases.]** *Revista Argentina de Microbiologia.* 1999. 31 (Suppl. 1) 19-20. Note: *Segundo Taller Internacional sobre Infecciones Humanas y Animales Producidas por Clamidas, Micobacterias, Brucelas y Borrelias, Buenos Aires, 25 Junio-4 Julio, 1997.* In Spanish.

**Descriptors:** cats, case reports, cat infectious diseases, *Mycobacterium bovis*, diseases, tuberculosis diseases, Argentina.

Ganiere, J.P.; Ruvoen, N.; L' Hostis, M.; Andre-Fontaine, G. **Les zoonoses infectieuses. [Infectious zoonoses.]** *Pathologie feline. Pratique Medicale and Chirurgicale de l'Animal de Compagnie.* 1999. 34 (supp 3) 463-472. Note: In French with an English summary.

**Descriptors:** cats, humans, zoonotic diseases, disease transmission, *Bartonella henselae*, *Pasturella*, Orthopox virus, *Chlamydia psittaci*, *Yersinia pestis*, *Francisella tularensis*, toxoplasmosis, tuberculosis, Q fever, reviews.

Kennis, R.A.; Wolf, A.M. **Chronic bacterial skin infections in cats.** *Compendium on Continuing Education for the Practicing Veterinarian.* 1999. 21 (12) 1108-1115, 1161.

**NAL call number:** SF601 C66

**Descriptors:** cats, skin diseases, *Mycoplasma*, *Mycobacterium*, *Nocardia*, *Actinomyces*, *Streptomyces*.

Montgomery, R.H. ***Mycobacteria* in New Zealand.** *Surveillance.* 1999. 26 (1) 6-8, 18.

**NAL call number:** SF604.63 N45S87

**Descriptors:** birds, possums, dogs, cats, rabbits, pigs, sheep, goats, deer, cattle, humans, *Mycobacterium* taxonomy, diagnosis, disease transmission, disease prevalence, disease control, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, Erinaceidae, *Mustela erminea*, *Mycobacterium avium*, *Mycobacterium paratuberculosis*, *Mycobacterium lepraemurium*, *Mycobacterium marinum*, *Mycobacterium kansasii*, New Zealand.

UK, British Small Animal Veterinary Association Scientific Committee. **Scientific information document: tuberculosis.** *Journal of Small Animal Practice.* 1999. 40 (3) 145-147.

**NAL call number:** 41.8 J8292

**Descriptors:** cattle, reptiles, fishes, amphibians, humans, cats, dogs, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium avium*, tuberculosis, zoonoses, pathogenesis, treatment, diagnosis, radiography, histopathology, reviews.

Underwood, S.C.; Pinto, S.; Rey-Moreno, M.C.; Carfagnini, J.C. **Tuberculosis felina: casos diagnosticados y**

**consideraciones sobre su posible fuente de infeccion. [Feline tuberculosis: cases diagnosed and their possible source of infection.]** *Revista Argentina de Microbiologia*. 1999. 31 (Supl. 1) 17-18. Note: *Segundo Taller Internacional sobre Infecciones Humanas y Animales Producidas por Clamidas, Micobacterias, Brucelas y Borrelias, Buenos Aires, 25 Junio-4 Julio, 1997*. In Spanish.

**Descriptors:** cats, diagnosis, tuberculosis, *Mycobacterium* diseases, cat diseases, disease transmission, sources of infection, Argentina.

## 1998

Fernandez, F.; Ouvina, G.; Morici, E.; Codoni, C. **Tuberculosis felina por *Mycobacterium bovis*. Comunicacion de dos casos. [Report of two cases of tuberculosis in cats due to *Mycobacterium bovis*.]** *Veterinaria Argentina*. 1998. 15 (145) 368-370. Note: In Spanish with an English summary.

**NAL call number:** SF604 V463

**Descriptors:** tuberculosis, case reports, pathology, *Mycobacterium bovis*, cats, Argentina.

Ma, Y.H.; Mo, Z.S.; Pan, H.; Ban, W.; Hu, Y.; Yan, S.T. **Investigation of tuberculosis in army and police dogs in South China.** *Chinese Journal of Veterinary Science and Technology*. 1998. 28 (1) 12. Note: In Chinese.

**Descriptors:** dogs, tuberculin intradermal testing, *Mycobacterium*, disease prevalence, military/police working dogs, Guangdong, Guangxi, China.

Shehab, M.M. (ed.); El Tahlawy, M.R. (ed.); Mahmoud, M.R. *Eighth Scientific Congress, Faculty of Veterinary Medicine, Assiut University, 15-17 November, 1998*. Assiut; Egypt, Faculty of Veterinary Medicine, Assiut University; 1998. 927 pp. Note: 74 papers.

**Descriptors:** livestock animals, cattle, camels, buffaloes, goats, sheep, rabbits, donkeys, dogs, pigs, mice, poultry, horses, rats, shrimp, many diseases, tuberculosis, brucellosis, aflatoxins, dermatitis, *Mycobacterium*.

Sutmoller, P.; Taylor, P. **An assessment of the risk of disease transmission by llama embryos.** *Proceedings One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October, 1998*. United States Animal Health Association; Richmond; USA 1998. p. 251-275.

**NAL call number:** 49.9 UN3R

**Descriptors:** llamas, artificial insemination, semen, embryo transfer, international trade, disease transmission, risk assessment, risk factors, foot and mouth disease, bluetongue virus, *Brucella*, *Mycobacterium*, *Aphthovirus*, methodology, contamination, epidemiology, Chile, US.

United States Animal Health Association. *Proceedings: One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October, 1998*. Richmond: The Association. 1998. 756 pp.

**NAL call number:** 49.9 UN3R

**Descriptors:** livestock, pigs, cattle, bison, horses, llamas, poultry, aquaculture species, wildlife, animal welfare, biotechnology, disease outbreaks, feeds, food safety, international trade, parasitoses, drugs, environment, rabies, bluetongue virus; Retroviridae, *Leptospira*, Aujeszky virus, *Salmonella*, *Mycobacterium bovis*, *Mycobacterium avium* ssp. *paratuberculosis*, USA.

## 1997

Ali, O.A.; Abdel Salam, E.B. **Incidence of animal diseases in Tripoli (Libya): a ten-year (1982-1991) pathological survey.** *Sudan Journal of Veterinary Science and Animal Husbandry*. 1997. 36 (1-2) 141-148.

**NAL call number:** 41.9 SU22

**Descriptors:** livestock animal diseases, dogs, pathology, abscesses, cirrhosis, coccidiosis, enteritis, hepatitis, leucosis, liver abscesses, liver flukes, lymphadenitis, Marek's disease, mastitis, pneumonia, poultry, *Mycobacterium*, tuberculosis, pasteurellosis, bovine mastitis, paratuberculosis, pulmonary adenomatosis, canine parvovirus, Libya.

Gunn-Moore, D.; Shaw, S. **Mycobacterial disease in the cat.** *In Practice*. Oct 1997. 19 (9) 493-501. ISSN: 0263-841X

**NAL call number:** SF601.I4

**Descriptors:** cats, mycobacterial diseases, tuberculosis, leprosy, etiology, pathology, pathogenesis, predisposition,

symptoms, diagnosis, diagnostic techniques, treatment, prognosis, drug therapy, opportunistic mycobacteriosis, *Mycobacterium*.

Schijns, V.E.C.J. (ed.); Horzinek, M.C. *Cytokines in veterinary medicine*. Wallingford, UK, CAB International. 1997 xxiv+324 pp.

**NAL call number:** SF757.25 C997 1997

**Descriptors:** diagnosis of tuberculosis, *Mycobacterium*, sheep, pigs, horses, avian, cats, cytokines in disease, responses and regulation, interferon-gamma assay.

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# Aquatic

2007

Chondrou, M.P.; Papanastasiou, A.D.; Zarkadis, I.K. **Molecular evolution of MAC complex: The case of rainbow trout.** *Molecular Immunology*. 2007; 44 (1-3, Sp. Iss. SI): 159. ISSN: 0161-5890. Note: 21st International Complement Workshop, Beijing, Peoples Republic of China; October 22 -26, 2006.

**URL:** <http://www.sciencedirect.com/science/journal/01615890>

**Descriptors:** rainbow trout (*Oncorhynchus mykiss*), *Mycobacterium avium* complex, molecular evolution.

Dvorska, L.; Matlova, L.; Ayele, W.Y.; Fischer, O.A.; Amemori, T.; Weston, R.T.; Alvarez, J.; Beran, V.; Moravkova, M.; Pavlik, I. **Avian tuberculosis in naturally infected captive water birds of the Ardeideae and Threskiornithidae families studied by serotyping, IS901 RFLP typing, and virulence for poultry.** *Veterinary Microbiology*. 2007; 119 (2/4): 366-374. ISSN: 0378-1135

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** Avian tuberculosis was detected in one flock of 38 water birds of the families Ardeideae (n=20) and Threskiornithidae (n=18). *Mycobacterium avium* subsp. *avium* (MAA, serotype 1, genotype IS901+ and IS1245+) was more often (p=0.01) detected in tissue and/or fecal samples in 18 (90.0%) birds from the Ardeideae family: little egret (*Egretta garzetta*), buff-backed heron (*Bubulcus ibis*), great white egret (*Egretta alba*), and bittern (*Botaurus stellaris*) in comparison to two (11.1%) birds from the Threskiornithidae family: sacred ibis (*Threskiornis aethiopicus*). Avian tuberculosis was not diagnosed in spoonbills (*Platalea leucorodia*). Tuberculous lesions were found in nine birds.

MAA isolates of IS901 RFLP type F-C3 were present in all of the 20 infected birds and in all environmental isolates.

A mixed infection with the MAA isolates of three RFLP types F-C3 (tissue isolate), G-C3, and T-C3 (fecal isolates) was found in one sacred ibis. All 20 tissue isolates of IS901 RFLP type F-C3 from 20 birds and 8 environmental MAA isolates were fully virulent in pullets, whilst the isolates of RFLP types G-C3 and T-C3 were non-virulent in pullets.

All of the tested MAA isolates had the same IS1245 RFLP "bird profile". In 12 of 20 infected birds with MAA *M.a. hominissuis* isolates of serotypes 4, 8, 9 and genotype IS901- and IS1245+ were detected and in 8 other birds mycobacteria not belonging to the *M. avium* complex were found. The presence of MAA in the environment may be a source for further spread of the causal agent of avian tuberculosis among other groups of animals in zoological gardens, farm animals, and also among their keepers..

**Descriptors:** bird diseases; wildlife disease reservoirs; Ardeideae family: little egret (*Egretta garzetta*), buff-backed heron (*Bubulcus ibis*), great white egret (*Egretta alba*), and bittern (*Botaurus stellaris*); comparison to two birds of the Threskiornithidae family: sacred ibis (*Threskiornis aethiopicus*); avian tuberculosis not diagnosed in spoonbills (*Platalea*

Godfrey, D; Williamson, H.; Silverman, J.; Small, P.L.C. **Newly identified *Mycobacterium* species in a *Xenopus laevis* colony.** *Comparative Medicine*. 2007; 57 (1): 97-104. ISSN: 1532-0820

**URL:** <http://www.aalas.org>

**NAL Call Number:** SF77.C65

**Abstract:** The University of Massachusetts Medical School maintains 3 separate research colonies of *Xenopus laevis*, with each colony located in a separate building on campus. After a 5-wk in-house quarantine period, 34 wild-caught *X. laevis* were transferred into one of the existing colonies. As a result, this colony grew from 51 to 85 frogs. All animals were housed in a recirculating frog housing system. During the first 2 mo, 6 frogs died suddenly, and health reports were generated for another 10 frogs in this colony. The majority of health reports were written in response to acute coelomic distention. These patterns continued until, after 1 y, only 25 of the original 85 animals remained. Necropsies performed showed large accumulations of serosanguinous fluid in the subcutaneous space or body cavity.

Granulomatous inflammatory lesions with acid-fast bacilli were generally present in the liver, lung, or spleen. Culture of affected tissues grew *Mycobacterium* sp. within 40 d. Polymerase chain reaction analysis confirmed the isolated organism to be the same species of *Mycobacterium* (provisionally named *M. liflandii*) recently reported by 2 other groups. However, previous clinical publications suggested that this bacterium originated only from *X. tropicalis*. The

cases we present highlight the rapidly lethal effects of *M. liflandii* in a colony of wild-caught *X. laevis* and illustrate the need to dedicate further attention to this emerging *Xenopus* disease..

**Descriptors:** research colony, frogs (*Xenopus laevis*), recirculating frog housing system, acute coelomic distention, serosanguinous fluid in body cavity, granulomatous inflammatory lesions on liver and lungs, death rate, *Mycobacterium liflandii*, US.

Suykerbuyk, Patrick; Vleminckx, Kris; Pasmans, Frank; Stragier, Pieter; Ablordey, Anthony; Tran, Hong Thi; Hermans, Katleen; Fleetwood, Michelle; Meyers, Wayne M.; Portaels, Francoise. ***Mycobacterium liflandii* infection in European colony of *Silurana tropicalis*.** *Emerging Infectious Diseases*. 2007; 13 (5): 743-746. ISSN: 1080-6040

**URL:** <http://www.cdc.gov/ncidod/EID/index.htm>

**Descriptors:** European colony, clawed frogs (*Silurana tropicalis*), *Mycobacterium liflandii*, fatal frog disease, captive anurans, transmission via international trade,

Watrall, V.; Kent, M.L. **Pathogenesis of *Mycobacterium* spp. in zebrafish (*Danio rerio*) from research facilities.**

*Comparative Biochemistry and Physiology C, Toxicology and Pharmacology*. 2007; 145 (1): 55-60. ISSN: 1532-0456

**URL:** <http://www.sciencedirect.com/science/journal/15320456>

**Abstract:** One of the most common diseases that we have diagnosed in zebrafish is mycobacteriosis, caused by several *Mycobacterium* spp. The severity of the disease ranged from severe outbreaks to incidental infections. We conducted an in vivo study to evaluate the pathogenesis of six isolates of *Mycobacterium* from zebrafish with mycobacteriosis from four research facilities and one wholesale supplier of zebrafish in the United States: *Mycobacterium abscessus*, *Mycobacterium peregrinum*, *Mycobacterium chelonae* (2 isolates), and *Mycobacterium marinum*. We also included two isolates of *M. marinum* from other fishes. Fish were exposed by intraperitoneal injection at a target dose of 5x10<sup>4</sup> bacteria/fish, and were held in static aquaria at 28 degrees C for 8 weeks. Fish were examined by histology and culture, and mortalities were recorded. The *M. marinum* isolates caused 100% infection and mortality between 30% and 100%. None of the other *Mycobacterium* species caused significant mortalities, but several of these fish had granulomatous lesions in visceral organs. *Mycobacteria* were consistently recovered in culture from fish exposed to *M. marinum*, and from only 9% of fish exposed to the other species. This study suggests that, of the isolates tested, only *M. marinum* is highly pathogenic and virulent to healthy zebrafish..

**Descriptors:** zebra fish (*Danio rerio*), bacterial infections, bacterioses, death rate, *Mycobacterium*, *Mycobacterium abscessus*, *Mycobacterium chelonae*, *Mycobacterium marinum*, Oregon, USA.

Whipps, Christopher M; Dougan, Scott T.; Kent, Michael L. ***Mycobacterium haemophilum* infections of zebrafish (*Danio rerio*) in research facilities.** *FEMS Microbiology Letters*. 2007; 270 (1): 21-26. ISSN: 0378-1097

**URL:** <http://www.blackwell-synergy.com/loi/fml>

**NAL Call Number:** QR1.F44

**Abstract:** In May 2005, a disease outbreak was investigated at a zebrafish (*Danio rerio*) research facility experiencing severe losses. *Mycobacterium haemophilum* was isolated from these fish and the disease was subsequently recreated in experimentally infected zebrafish. Fish exhibited signs characteristic of mycobacteriosis, including granuloma formation and severe, diffuse, chronic inflammation. Bacteria were observed in multiple tissues, including the central nervous system. Biofilm samples from the outbreak facility were PCR positive for *M. haemophilum*, suggesting biofilms might act as a reservoir for infection. Zebrafish appear to be particularly vulnerable to *M. haemophilum*, and measures such as quarantine and treatment of incoming water should be implemented to minimize the likelihood of introduction of this bacterium to zebrafish research facilities. Zebrafish are already a well-established laboratory animal model for genetics, toxicology and disease, their susceptibility to *M. haemophilum* may make them useful for the study of this bacterium in the future.

**Descriptors:** zebrafish (*Danio rerio*), research facility, clinical picture, chronic inflammation, biofilms, *Mycobacterium haemophilum*, maybe useful as a research model for pathogen.

Yip, Marcus J.; Porter, Jessica L.; Fyfe, Janet A.M.; Lavender, Caroline J.; Portaels, Francoise; Rhodes, Martha; Kator, Howard; Colorni, Angelo; Jenkin, Grant A.; Stinear, Tim. **Evolution of *Mycobacterium ulcerans* and other mycolactone-producing mycobacteria from a common *Mycobacterium marinum* progenitor.** *Journal of Bacteriology*. 2007; 189 (5): 2021-2029. ISSN: 0021-9193

**URL:** <http://jb.asm.org/>

**NAL Call Number:** 448.3 J82

**Descriptors:** evolution of cytotoxic polyketide mycolactones, *Mycobacterium ulcerans*, Buruli ulcers, *Mycobacterium marinum* progenitor of mycolactones, multiple genetic methods, multilocus sequence analysis, DNA-DNA hybridization, plasmid acquisition, ecotypes, pathogens of ectotherms and endotherms, mammals, frogs, fish.

## 2006

Baska, F.; Gonda, E. **Diszhalak virusos es bakteriumos megbetegedesei. [Viral and bacterial diseases of aquarium fish.]** *KisallatPraxis*. 2006; 7 (2): 42-50. ISSN: 1585-9142. Note: In Hungarian with an English summary.

**URL:** <http://www.kisallatpraxis.hu>

**Descriptors:** pet fish, diseases, *Aeromonas salmonicida*, *Flavobacterium*, lymphocystis virus, *Mycobacterium tuberculosis*, spring viraemia of carp virus recommended antibacterial treatments.

Beran, V.; Matlova, L.; Horvathova, A.; Bartos, M.; Moravkova, M.; Pavlik, I. **Mycobacteria in the animal's environment in the Czech Republic.** *Veterinarski Arhiv*. 2006; 76(Supplement): S33-S39. ISSN: 0372-5480

**URL:** <http://www.vetf.hr/vetarhiv>

**NAL Call Number:** 41.8 V6416

**Descriptors:** farm and captive wild animals, environmental mycobacteria, breeding facilities, tanks, fish aquaria, peat as feed supplement, 1389 samples, 29 sites, bacteria cultured, Stonebrink's medium, Herrold's egg yolk medium, Sula's medium, *Mycobacterium avium*, *Mycobacterium fortuitum*, *Mycobacterium gordonae*, *Mycobacterium marinum*, *Mycobacterium flavescens*, zoonotic infections, Czech Republic.

Beran, V.; Matlova, L.; Dvorska, L.; Svastova, P.; Pavlik, I. **Distribution of mycobacteria in clinically healthy ornamental fish and their aquarium environment.** *Journal of Fish Diseases*. 2006; 29 (7): 383-393. ISSN: 0140-7775

**URL:** <http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=jfd>

**Descriptors:** fish, snails, feeds, *Mycobacterium* species, *Mycobacterium marinum*, chronic fish diseases, fish tank granuloma, decorative aquarium, breeder fish facility, *Mycobacterium chelonae*, *Mycobacterium fortuitum*; *Mycobacterium intracellulare*, *Mycobacterium kansasii*, *Mycobacterium terrae*, *Planorbarius corneus*, *Mycobacterium celatum*, *Mycobacterium diernhoferi*, *Mycobacterium flavescens*, *Mycobacterium gordonae*, *Mycobacterium triviale*, zoonotic infections, Czech Republic.

Chacko, K.L.; Vineeth Rajagopal; Jaibi, K.; Latha, C.; Nanu, E. **Fish borne bacterial zoonoses.** *Intas Polivet*. 2006; 7 (2): 207-211. ISSN: 0972-1738

**Descriptors:** fish borne bacterial zoonoses, diagnosis, mode of transmission, clinical features, treatment, vibriosis, *Aeromonas*, *Edwardsiella tarda*, *Plesiomonas shigelloides*, *Yersinia enterocolitica*, *Escherichia coli*, *Clostridium botulinum* type E, *Staphylococcus aureus*, *Mycobacterium*, *Listeria monocytogenes*, *Erysipelothrix* infections, salmonellosis and shigellosis, control measures outlined.

Chai, N.; Deforges, L.; Sougakoff, W.; Truffot-Pernot, C.; Luze, A. de; Demeneix, B.; Clement, M.; Bomsel, M.C.

***Mycobacterium szulgai* infection in a captive population of African clawed frogs (*Xenopus tropicalis*).** *Journal of Zoo and Wildlife Medicine*. 2006; 37 (1): 55-58. ISSN: 1042-7260

**URL:** <http://www.bioone.org/perlserv/?request=get-archive&issn=1042-7260>

**NAL Call Number:** SF601.J6

**Descriptors:** African clawed frogs (*Xenopus tropicalis*), captive colony, *Mycobacterium szulgai*, clinical picture, lethargy, weight loss, emaciation, visceral granulomas, mycobacteriosis, 16S rRNA gene sequence, postmortem inspections, France.

Chang, Tsung Chou; Hsieh, Chia Yu; Chang, Ching Dong; Shen, Ying Ling; Huang, Kwo Ching; Tu, Chien; Chen, Li Chun; Wu, Zong Bing; Tsai, Shinn, Shyong. **Pathological and molecular studies on mycobacteriosis of milkfish *Chanos chanos* in Taiwan.** *Diseases of Aquatic Organisms*. 2006; 72 (2): 147-151. ISSN: 0177-5103

**URL:** <http://www.int-res.com/abstracts/dao/v72/n2/p147-151/>

**Descriptors:** milk fish (*Chanos chanos*), case report, nodules, lesions, spleen, kidney, liver, GI tract, epithelioid granulomas, Langhan's type giant cell, match *Mycobacterium abscessus* Type II (GenBank accession number

AY603554), first report of pathogen in milk fish.

Colorni, Angelo; Diamant, Ariel; Kvitt, Hagit; Ucko, Michal. **Traditional and phylogenetic approaches in the diagnosis and identification of pathogens in mariculture** *Israeli Journal of Aquaculture Bamidgeh*. 2006; 58 (4, Sp. Iss. SI): 374. ISSN: 0792-156X

**NAL Call Number:** SH117.I75B36

**Descriptors:** mariculture, fish culture, pathogens, *Enteromyxum leei*, *Kudoa iwatai*, *Streptococcus iniae*, *Mycobacterium marinum*, sea bream, sea bass, genetic diversity, cytopathic effect, complex life cycle, phylogenetic approach.

Cosma, Christine L.; Klein, Kathryn; Kim, Rosa; Beery, Dana; Ramakrishnan, Lalita.

***Mycobacterium marinum* Erp is a virulence determinant required for cell wall integrity and intracellular survival.** *Infection and Immunity (IAI)*. 2006 June; 74 (6): 3125-3133. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The *Mycobacterium tuberculosis* exported repetitive protein (Erp) is a virulence determinant required for growth in cultured macrophages and in vivo. To better understand the role of Erp in *Mycobacterium* pathogenesis, we generated a mutation in the Erp homologue of *Mycobacterium marinum*, a close genetic relative of *M. tuberculosis*.

Erp-deficient *M. marinum* was growth attenuated in cultured macrophage monolayers and during chronic granulomatous infection of leopard frogs, suggesting that Erp function is similarly required for the virulence of both *M. tuberculosis* and *M. marinum*. To pinpoint the step in infection at which Erp is required, we utilized a zebrafish embryo infection model that allows *M. marinum* infections to be visualized in real-time, comparing the Erp-deficient strain to a [Delta]RD1 mutant whose stage of attenuation was previously characterized in zebrafish embryos. A detailed microscopic examination of infected embryos revealed that bacteria lacking Erp were compromised very early in infection, failing to grow and/or survive upon phagocytosis by host macrophages. In contrast, [Delta]RD1 mutant bacteria grow normally in macrophages but fail to induce host macrophage aggregation and subsequent cell-to-cell spread. Consistent with these in vivo findings, Erp-deficient but not RD1-deficient bacteria exhibited permeability defects in vitro, which may be responsible for their specific failure to survive in host macrophages.

**Descriptors:** *Mycobacterium marinum*, zebrafish (*Danio rerio*), embryo infection model, exported repetitive protein (Erp), effect of Erp negative bacteria on infection.

Ferreira, R.; Fonseca, L de S.; Afonso, A.M.; Silva, M.G. da; Saad, M.H.; Lilenbaum, W. **A report of mycobacteriosis caused by *Mycobacterium marinum* in bullfrogs (*Rana catesbeiana*).** *Veterinary Journal*. 2006 Jan; 171 (1): 177-180. ISSN: 1090-0233

**NAL Call Number:** SF601.V484

**Abstract:** The occurrence of mycobacteriosis caused by *Mycobacterium marinum* in a commercial breeding farm of bullfrogs (*Rana catesbeiana*) in Rio de Janeiro, Brazil is described. Ten animals presented skin lesions on the head and extremities. These and 38 other asymptomatic adult animals from various tanks were killed and at necropsy disseminated granulomatous lesions were observed in the 10 clinically affected animals and in 16 (42.1%) of the asymptomatic frogs. Acid-fast bacilli were observed in all smears of the 10 symptomatic frogs and in all but one from the 16 asymptomatic animals with visceral lesions. Ten samples from the 25 positive animals were randomly selected for culture which yielded four isolates of fast-growing (<7 days) mycobacteria. Those purified isolates were characterised by biochemical traditional means as *M. marinum*. Identification of the strains was confirmed using reverse-phase high-performance liquid chromatography and a polymerase chain reaction (PCR) restriction enzyme analysis assay. It is suggested that *M. marinum* is an important agent of granulomatous disease in bullfrogs and that infected animals, even when asymptomatic, could act as reservoirs spreading the disease and contaminating other frogs in the farm.

**Descriptors:** *Rana catesbeiana*, farmed bullfrogs, tubercular skin lesions, *Mycobacterium marinum*, disease outbreaks, disease diagnosis, fast-growing *Mycobacterium* strains, pathogen identification, Brazil.

Hsieh, C.Y.; Chang, T.C.; Shen, Y.L.; Chang, C.D.; Tu, C.; Tung, M.C.; Chen, L.C.; Tsai, S.S. **Pathological and PCR detection of mycobacteriosis in pond-cultured Chinese soft shell turtles, *Trionyx sinensis*.** *Aquaculture*. 2006 Nov 16; 261 (1): 10-16. ISSN: 0044-8486

**URL:** <http://dx.doi.org/10.1016/j.aquaculture.2006.07.005>

**NAL Call Number:** SH1.A6

**Abstract:** Mycobacteriosis due to infection of *Mycobacterium marinum* is a common disease in pond-cultured Chinese soft shell turtles, especially in those surviving beyond their first year. The infected turtles independently showed either heterophilic or histiocytic granulomas in various organs such as the spleen, liver, lungs, intestine, kidneys, stomach and pancreas. The heterophilic granuloma contained many acid-fast unbranching bacilli intracellularly in macrophages and extracellularly in the necrotic center. The histiocytic granuloma had only a few bacteria, mainly in the cytoplasm of Langhan's giant cells. The organisms were rarely observed in the advanced lesions of both types. Based on PCR assays for partial hsp65 gene of *Mycobacterium* spp., all of our strains were identified as *M. marinum* which can be divided into two groups. The strains of the first group induced heterophilic granulomas and had very high nucleotide sequence identities (99.8%-100%) to the reference strains of *M. marinum* (AF456471) and *M. pseudoshottsii* (AY550226). Those strains of the second group caused histiocytic granulomas and also showed very high identities (99.8%-100%) to the reference strains of *M. marinum* ATCC 927 (AF456470) and *M. shottsii* (AY550225). However, when we compared the partial sequence of the hsp65 gene from group one and two strains the identities between the two groups range from 98.8% to 99.3%, therefore we can not assert that these two belong to the same species.

**Descriptors:** *Mycobacterium marinum*, animal pathogenic bacteria, heat shock proteins, bacterial proteins, sequence analysis, disease detection, pathogen identification, *Trionyx sinensis*, soft shelled turtles histopathology, turtle culture.

Karsten, A.H.; Rice, C.D. **Serum IgM levels against select marine bacteria in the Atlantic sharpnose shark (*Rhizoprionodon terraenovae*) from three estuaries.** *Comparative Biochemistry and Physiology C, Toxicology and Pharmacology*. 2006; 143 (3): 355-361. ISSN: 1532-0456.

**URL:** <http://www.sciencedirect.com/science/journal/15320456>

**NAL Call Number:** QP901.C6

**Descriptors:** Atlantic sharpnose shark (*Rhizoprionodon terraenovae*), *Escherichia coli*, *Listonella anguillarum*, *Mycobacterium fortuitum*, *Mycobacterium marinum*, *Vibrio cholerae*, *Vibrio parahaemolyticus*, immunity reactions, immunological reactions, IgM, bacteriosis. Atlantic Ocean.

Lowry, T.; Smith, S.A. ***Mycobacterium* sp. infection in cultured cobia (*Rachycentron canadum*).** *Bulletin of the European Association of Fish Pathologists*. 2006; 26 (2): 87-92. ISSN: 0108-0288

**Descriptors:** juvenile cobia fish (*Rachycentron canadum*), clinical picture, emaciation, lethargy, ulcerative-dermal lesions, exophthalmis, hyperpigmentation, hypopigmentation, *Aeromonas hydrophila*, *Citrobacter*, granulomas of various organs, cultured on Middlebrook agar, *Mycobacterium marinum*, USA.

Maclean, B. **Common dermatoses of ornamental fish and amphibians.** *In Practice*. 2006; 28 (10): 604-615. ISSN: 0263-841X

**URL:** <http://www.bvapublications.com>

**NAL Call Number:** SF601.I4

**Descriptors:** *Aeromonas*, *Amphibia*, fish, pet fish or frogs, toads, bacteria, *Dermocystidium*, *Mycobacterium*, mycobacterial infections, Protozoa, *Pseudomonas*, *Saprolegnia*, Metazoa, Peronosporomycetes, Saprolegniaceae, *Straminipila*, *Batrachochytrium* viruses, anesthesia, antimicrobials, chemotherapy, bacterial infections, protozoal diseases, clinical picture, death rate, dermis, viral infections, zoonotic infections, skin pathogens, UK.

Miller, D.L.; Gray, M.J.; Rajeev, S.; Baldwin, C.A. **Preliminary pathologic findings in bullfrog (*Rana catesbiana*) and green frog (*Rana clamitans*) larvae collected from farm ponds in Tennessee.** *Proceedings of the Association of Reptilian and Amphibian Veterinarians, Thirteenth Annual Conference, Baltimore, Maryland, USA, 23-27 April, 2006*. 2006: 1-3

**Descriptors:** frogs, tadpoles, *Rana*, *Rana catesbeiana*, *Rana clamitans*, *Aeromonas hydrophila*, *Corynebacterium*, Iridovirus, *Mycobacterium*, *Pseudomonas*, cattle pasture, introduced pathogens, farm pond environments, Tennessee, US.

Nenoff, P.; Uhlemann, R. **Mycobacteriosis in mangrove killifish (*Rivulus maderae*) caused by living fish food (*Tubifex tubifex*) infected with *Mycobacterium marinum*.** *Deutsche Tierärztliche Wochenschrift*. 2006; 113 (6): 230-232. ISSN: 0341-6593. Note: In English with a German summary.

**URL:** <http://www.schaper-verlag.de>

**NAL Call Number:** 41.8 D482

**Descriptors:** contaminated live fish food, *Mycobacterium marinum*, mud tube worm (*Tubifex tubifex*), mangrove killifish, (*Rivulus magdalenae*).

Pasmans, F.; Mutschmann, F.; Halliday, T.; Zwart, P. **Amphibian decline: the urgent need for amphibian research in Europe.** *Veterinary Journal*. 2006; 171 (1): 18-19. ISSN: 1090-0233

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/623077/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/623077/description#description)

**Descriptors:** Amphibian decline, *Mycobacterium marinum*, *Rana catesbeiana*, need for research, *Euproctus platycephalus*; chytridiomycosis; *Batrachochytrium dendrobatidis*, frogs, tuberculosis, *Mycobacterium*, disease outbreaks, epidemiology, salamanders, endangered species, *Rana catesbeiana*, mycoses, *Xenopus*, wild animals, Europe.

Pasnik, David J.; Smith, Stephen A. **Immune and histopathologic responses of DNA-vaccinated hybrid striped bass *Morone saxatilis* x *M-chrysops* after acute *Mycobacterium marinum* infection.** *Diseases of Aquatic Organisms*. 2006; 73(1): 33-41. ISSN: 0177-5103

**Descriptors:** *Mycobacterium marinum* pathogen, *Morone saxatilis* x *Morone chrysops*, hybrid striped bass, immature, pathogen host, vaccinated with DNA vaccine encoding the *Mycobacterium marinum* Ag85A gene, acute high-dose challenge with *Mycobacterium marinum*, disease severity, immune response, histopathologic response, sufficient but limited duration of protection.

Ponpornpisit, A.; Pirarat, N.; Areechon, N.; Kono, T.; Sakai, M.; Katagiri, T.; Endo, M. **The detection of guppy (*Poecilia reticulata*) mycobacterium by the loop-mediated isothermal amplification (LAMP) technique.** *Thai Journal of Veterinary Medicine*. 2006; 36 (1): 78. ISSN: 0125-6491

**NAL Call Number:** SF604.T43

**Descriptors:** loop-mediated isothermal amplification (LAMP) technique, *Mycobacterium* strain Thai 4, detection in guppy (*Poecilia reticulata*), possible rapid diagnostic tool, 60 minutes test time.

Poort, M.J.; Whipps, C.M.; Watral, V.G.; Font, W.F.; Kent, M.L. **Molecular characterization of a *Mycobacterium* species in non-native poeciliids in Hawaii using DNA sequences.** *Journal of Fish Diseases*. 2006; 29 (3): 181-185. ISSN: 0140-7775

**URL:** <http://www.blackwell-synergy.com/loi/jfd>

**Descriptors:** fishes, *Mycobacterium triplex* clade, 29 shortfin mollies (*Poecilia mexicana*), 3 green swordtails (*Xiphophorus helleri*), granulomas in organs, liver, spleen, kidneys, mesenteries, gills, PCR analysis, islands of Hawaii and Oahu, Hawaii, US.

Sequence data: EMBL/GenBank Data Libraries under Accession Number DQ078788..

Ranger, Brian S.; Mahrous, Engy A.; Mosi, Lydia; Adusumilli, Sarojini; Lee, Richard E.; Colorni, Angelo; Rhodes, Martha; Small, P.L.C. **Globally distributed mycobacterial fish pathogens produce a novel plasmid-encoded toxic macrolide, mycolactone F.** *Infection and Immunity (IAI)*. 2006 Nov; 74 (11): 6037-6045. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** *Mycobacterium ulcerans* and *Mycobacterium marinum* are closely related pathogens which share an aquatic environment. The pathogenesis of these organisms in humans is limited by their inability to grow above 35degrees C. *M. marinum* causes systemic disease in fish but produces localized skin infections in humans. *M. ulcerans* causes Buruli ulcer, a severe human skin lesion. At the molecular level, *M. ulcerans* is distinguished from *M. marinum* by the presence of a virulence plasmid which encodes a macrolide toxin, mycolactone, as well as by hundreds of insertion sequences, particularly IS2404. There has been a global increase in reports of fish mycobacteriosis. An unusual clade of *M. marinum* has been reported from fish in the Red and Mediterranean Seas and a new mycobacterial species, *Mycobacterium pseudoshottsii*, has been cultured from fish in the Chesapeake Bay, United States. We have discovered that both groups of fish pathogens produce a unique mycolactone toxin, mycolactone F. Mycolactone F is the smallest mycolactone (molecular weight, 700) yet identified. The core lactone structure of mycolactone F is identical to that of *M. ulcerans* mycolactones, but a unique side chain structure is present. Mycolactone F produces apoptosis and necrosis on cultured cells but is less potent than *M. ulcerans* mycolactones. Both groups of fish pathogens contain IS2404. In contrast to *M. ulcerans* and conventional *M. marinum*, mycolactone F-producing mycobacteria are incapable of growth at above 30degrees C. This fact is likely to limit their virulence for humans. However, such isolates may provide a

reservoir for horizontal transfer of the mycolactone plasmid in aquatic environments.

**Descriptors:** fish pathogens, *Mycobacterium ulcerans*, *Mycobacterium marinum* aquatic environments, zoonotic skin lesions, unique mycolactone toxin, mycolactone F production, IS240, reservoirs for horizontal transfer. Red and Mediterranean Seas, Chesapeake Bay.

Seok, Seung Hyeok; Koo, Hye Cheong; Kasuga, A.; Kim, Yeun; Lee, Eun Gae; Lee, Hye Young; Park, Jong Hwan; Baek, Min Won; Lee, Hui Young; Kim, Dong Jae; Lee, Byeung Hee; Lee, Yong Soon; Cho, Sang Nae; Park, Jae Hak. **Use of PCR-restriction fragment length polymorphism for the identification of zoonotic mycobacteriosis in zebrafish caused by *Mycobacterium abscessus* and *Mycobacterium chelonae*.** *Veterinary Microbiology*. 2006 May 31; 114 (3-4): 292-297. ISSN: 0378-1135

**URL:** <http://dx.doi.org/10.1016/j.vetmic.2005.12.006>

**NAL Call Number:** SF601.V44

**Abstract:** Skin ulcers, scoliosis, and dropsy-like scale edema were observed in laboratory-maintained zebrafish.

Affected fish had multifocal granulomas not only in internal organs such as the liver, intestine, genital organs, kidney, muscle, and spleen but also in the fin, epithelium, gills, and sclera of the eyes. Large numbers of acid-fast-rod-shaped bacteria were observed within the necrotic centers of well-demarcated, multifocal granulomas with Gram's stain and Ziehl-Neelson's stain. The size of the *Mycobacterium* spp. was 1-2 micrometer x 2-3 micrometer with a double-layered cell wall, based upon electron-microscopical features. Definitive diagnosis of these outbreaks was obtained by culture on selective media followed by PCR-restriction fragment length polymorphism analysis (PRA) of the *rpoB* gene for species identification. The amplified 360-bp products of the *rpoB* gene of mycobacteria isolated from zebrafish were digested with *MspI* restriction enzyme, which revealed unique band patterns matching those of *Mycobacterium abscessus* and *Mycobacterium chelonae* which are responsible for skin and soft tissue infection caused by rapidly growing mycobacteria in humans. This is the first documentation of the precise identification of zoonotic non-tuberculous mycobacteria isolated from laboratory-maintained zebrafish by the PRA of the *rpoB* gene; this study thus provides a great deal of useful epidemiological information and reduces the likelihood that epizootics will occur.

**Descriptors:** zebra fish, *Danio rerio*, laboratory infection, diseases presentation, skin ulcers, scoliosis, scale edema, internal organs affected, diagnostic tests, *Mycobacterium marinum*, *Mycobacterium chelonae*, clinical picture, zoonotic disease, diagnostic tests.

Swaim, Laura E.; Connolly, Lynn E.; Volkman, Hannah E.; Humbert, Olivier.; Born, Donald E.; Ramakrishnan, Lalita. ***Mycobacterium marinum* infection of adult zebrafish causes caseating granulomatous tuberculosis and is moderated by adaptive immunity.** *Infection and Immunity* (IAI). 2006 Nov; 74 (11): 6108-6117. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** The zebrafish, a genetically tractable model vertebrate, is naturally susceptible to tuberculosis caused by *Mycobacterium marinum*, a close genetic relative of the causative agent of human tuberculosis, *Mycobacterium tuberculosis*. We previously developed a zebrafish embryo-*M. marinum* infection model to study host-pathogen interactions in the context of innate immunity. Here, we have constructed a flowthrough fish facility for the large-scale longitudinal study of *M. marinum*-induced tuberculosis in adult zebrafish where both innate and adaptive immunity are operant. We find that zebrafish are exquisitely susceptible to *M. marinum* strain M. Intraperitoneal injection of five organisms produces persistent granulomatous tuberculosis, while the injection of ~9,000 organisms leads to acute, fulminant disease. Bacterial burden, extent of disease, pathology, and host mortality progress in a time- and dose-dependent fashion. Zebrafish tuberculous granulomas undergo caseous necrosis, similar to human tuberculous granulomas. In contrast to mammalian tuberculous granulomas, zebrafish lesions contain few lymphocytes, calling into question the role of adaptive immunity in fish tuberculosis. However, like *rag1* mutant mice infected with *M. tuberculosis*, we find that *rag1* mutant zebrafish are hypersusceptible to *M. marinum* infection, demonstrating that the control of fish tuberculosis is dependent on adaptive immunity. We confirm the previous finding that *M. marinum* (SE(BRD1 mutants are attenuated in adult zebrafish and extend this finding to show that (SE(BRD1 predominantly produces nonnecrotizing, loose macrophage aggregates. This observation suggests that the macrophage aggregation defect associated with (SE(BRD1 attenuation in zebrafish embryos is ongoing during adult infection.

**Descriptors:** zebrafish, *Mycobacterium marinum*, embryo infection model, host-pathogen interaction, immunity, pathology, granulomas, lesions, macrophage aggregation defect.

Tarigo, J.; Linder, K.; Neel, J.; Harvey, S.; Remick, A.; Grindem, C. **Reluctant to dive: coelomic effusion in a frog.**

*Veterinary Clinical Pathology*. 2006; 35 (3): 341-344. ISSN: 0275-6382

**NAL Call Number:** SF601.A54

**Descriptors:** adult female albino South African Clawed frog (*Xenopus laevis*), laboratory research colony, clinical picture, case report, lethargy, distended abdomen, loss of diving reflex, coelomic effusion fluid, histopathology, organ effects, *Mycobacterium marinum*, model for *Mycobacterium tuberculosis*, North Carolina State University.

## 2005

Bigi, Fabiana; Garcia-Pelayo, M. Carmen; Nunez-Garcia, Javier; Peralta, Andrea; Caimi, Karina C.; Golby, Paul; Hinds, Jason; Cataldi, Angel; Gordon, Stephen V.; Romano, Maria I. **Identification of genetic markers for *Mycobacterium pinnipedii* through genome analysis.** *FEMS Microbiology Letters*. 2005; 248 (2): 147-152. ISSN: 0378-1097

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/506058/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/506058/description#description)

**NAL Call Number:** QR1.F44

**Descriptors:** seals, *Mycobacterium pinnipedii*, genetic variability with *Mycobacterium bovis*, microarray-based comparative genomics, 2 deletions identified, *M. tuberculosis* genes, PiD1--Rv3530c and Rv3531c, PiD2--Rv1977 and Rv1978.

Fitzgerald, S.D.; Boland, K.G.; Clarke, K.R.; Wismer, A.; Kaneene, J.B.; Berry, D.E.; Church, S.V.; Hattey, J.A.; Bolin, C.A. **Resistance of mallard ducks (*Anas platyrhynchos*) to experimental inoculation with *Mycobacterium bovis*.** *Avian Diseases*. 2005; 49 (1): 144-146. ISSN: 0005-2086

**URL:** <http://avdi.allenpress.com/avdionline/?request=index-html>

**NAL Call Number:** 41.8 AV5

**Abstract:** The purpose of this study was to investigate whether mallard ducks (*Anas platyrhynchos*) are susceptible to infection with *Mycobacterium bovis* by either oral or intratracheal inoculation and to assess their potential role in the spread of bovine tuberculosis. Six ducks were orally inoculated with  $1.0 \times 10^5$  colony-forming units of *M. bovis*, six ducks were intratracheally inoculated with the same dose, and six ducks served as sham-inoculated controls. The study length was 90 days postinoculation, with samples of two birds from each group necropsied at 30-day intervals. Both fecal and tissue samples were collected for mycobacterial culture. None of the inoculated ducks shed *M. bovis* in their feces at any culture point (days 1, 30, and 60) during the study. No evidence of illness or weight loss was present during the course of the study, and only one duck had *M. bovis* isolated from any tissue, although there were no associated microscopic lesions. Mallard ducks were highly resistant to infection with *M. bovis* following high-dose inoculation and did not shed the organism in their feces. This study was conducted using high-dose inoculation; therefore, it appears that ducks are unlikely to play any significant role in the transmission of *M. bovis* between infected and uninfected mammalian hosts.

**Descriptors:** mallard ducks (*Anas platyrhynchos*), susceptibility to infection with *Mycobacterium bovis*, possible reservoir for pathogen, experimental infection, high dose oral or intra-tracheal inoculation, no evidence of disease found, unlikely reservoir of disease pathogens.

Jesenska, Andrea; Pavlova, Martina; Strouhal, Michal; Chaloupkova, Radka; Tesinska, Iva; Monincova, Marta; Prokop, Zbynek; Bartos, Milan; Pavlik, Ivo; Rychlik, Ivan; Moebius, Petra; Nagata, Yuji; Damborsky, Jiri. **Cloning, biochemical properties, and distribution of mycobacterial haloalkane dehalogenases.** *Applied and Environmental Microbiology*. 2005; 71 (11): 6736-6745. ISSN: 0099-2240

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=83>

**NAL Call Number:** 448.3 Ap5

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, haloalkane dehalogenases, enzymes, cloning of enzyme genes dmbA and dmbB of *M. bovis* 5033/66, dehalogenase activity of translation products, distribution of genes in following species--*Mycobacterium bovis*, *Mycobacterium bovis* BCG, *Mycobacterium africanum*, *Mycobacterium caprae*, *Mycobacterium microti*, and *Mycobacterium pinnipedii*, characterization of proteins, evolution and distribution of haloalkane dehalogenases among mycobacteria.

Kaattari, I.M.; Rhodes, M.W.; Kator, H.; Kaattari, S.L. **Comparative analysis of mycobacterial infections in wild striped bass *Morone saxatilis* from Chesapeake Bay.** *Diseases of Aquatic Organisms*. 2005; 67 (1/2): 125-132. ISSN: 0177-5103

**URL:** <http://www.int-res.com/abstracts/dao/v67/n1-2/p125-132/>

**Descriptors:** wild striped bass (*Morone saxatilis*), *Mycobacterium*, disease detection, spleen tissue analysis, histology, quantitative culture, nested PCR, comparison study, Chesapeake Bay, Maryland.

Korun, J.; Olgac, V.; Akgun Dar, K.; Colorni, A.; Diamant, A. **Mycobacteriosis in European sea bass, *Dicentrarchus labrax*, cultured in Turkey.** *Israeli Journal of Aquaculture Bamidgeh*. 2005; 57 (4): 215-222. ISSN: 0792-156X

**NAL Call Number:** SH117.I75B36

**Descriptors:** European sea bass (*Dicentrarchus labrax*) aquaculture, *Mycobacterium* diseased fish, clinical picture, grayish nodules, liver spleen, kidneys, granulomatous mass protruded into abdominal cavity, Turkey.

Li, P.; Gatlin, D.M. III. **Evaluation of the prebiotic GroBiotic-A and brewers yeast as dietary supplements for sub-adult hybrid striped bass (*Morone chrysops* x *M. saxatilis*) challenged in situ with *Mycobacterium marinum*.** *Aquaculture*. 2005 July 29; 248 (1-4): 197-205. ISSN: 0044-8486. Note: Paper presented at the 11th International Symposium on Nutrition and Feeding in Fish, held May 2-7, 2004, Phuket Island, Thailand. Includes references.

**URL:** <http://www.elsevier.com/locate/issn/00448486>

**NAL Call Number:** SH1.A6

**Abstract:** Dietary supplements such as immunostimulants and prebiotics hold promise as a potential replacement of antibiotics in maintaining fish health. A 21-week feeding trial was conducted to evaluate the commercial prebiotic GroBiotic-A, a mixture of partially autolyzed brewers yeast, dairy ingredient components and dried fermentation products, in the diet of hybrid striped bass exposed to chronic mycobacterial infection caused by *Mycobacterium marinum*, as compared to partially autolyzed brewers yeast (Brewtech). The basal diet was formulated to contain 40% protein, 10% lipid and an estimated digestible energy level of 3.5 kcal/g. Supplements of 1 or 2% brewers yeast and 2% GroBiotic-A were singularly added to the basal diet and each diet was manufactured by extrusion processing with a twin-screw extruder. Each diet was fed to three replicate groups of small (initially averaging 64.5 g/fish) and one group of large (initially averaging 118 g/fish) hybrid striped bass in 1187-l circular tanks operated as a recirculating system. Fish were fed twice daily to apparent satiation and growth performance monitored for 16 weeks. An in situ infection of *M. marinum* became well established at week 16 such that fish were fed once daily and mortality was monitored for a total of 21 weeks. Enhanced growth performance was generally observed in fish fed diets supplemented with GroBiotic-A or brewers yeast compared to fish fed the basal diet throughout the feeding trial with significantly ( $P < 0.05$ ) enhanced weight gain observed after 12 weeks of feeding. At the end of the feeding trial, fish fed 2% brewers yeast had significantly higher feed efficiency than fish fed the other diets. The in situ mycobacterial challenge employed in this experiment resulted in overall cumulative mortality of approximately 25%. Fish fed 2% GroBiotic-A had a significantly ( $P < 0.05$ ) enhanced survival (80%) compared to the other treatments (72-73%) at the end of 21 weeks. It is concluded that dietary supplementation of 2% GroBiotic-A showed moderate but significant ( $P < 0.05$ ) protection against mycobacterial infection. Dietary supplementation of partially autolyzed brewers yeast also may enhance growth performance under chronic infection of mycobacteria.

**Descriptors:** *Morone chrysops*; *Morone saxatilis*, bass fish hybrids, freshwater fish, animal growth, immune response, brewers yeast, feed supplements, prebiotics, *Mycobacterium marinum*, fish culture, freshwater aquaculture.

Pasnik, D.J.; Smith, S.A. **Immunogenic and protective effects of a DNA vaccine for *Mycobacterium marinum* in fish.** *Veterinary Immunology and Immunopathology*. 2005 Feb 10; 103 (3-4): 195-206. ISSN: 0165-2427

**NAL Call Number:** SF757.2.V38

**Descriptors:** *Morone saxatilis*, *Morone chrysops*, bass fish hybrids, *Mycobacterium marinum*, mycobacterial diseases, fish diseases, vaccines, vaccination, genes, binding proteins, DNA, immune response, humoral immunity, phagocytosis, DNA vaccines.

Stine, C.B.; Baya, A.M.; Salierno, J.D.; Kollner, M.; Kane, A.S. **Mycobacterial infection in laboratory-maintained Atlantic menhaden.** *Journal of Aquatic Animal Health*. 2005; 17 (4): 380-385. ISSN: 0899-7659

**NAL Call Number:** SH171.J68

**Descriptors:** Atlantic menhaden (*Brevoortia tyrannus*), laboratory maintained fish, wild caught, *Mycobacterium*, *Mycobacterium fortuitum*, *Mycobacterium marinum*, *Mycobacterium gordonae*, clinical picture, open ulcer, disease prevalence, tissue sampling, granulomas, spleens, posterior kidneys, hearts.

Fitzgerald, S.D.; Maar, T.W.J. de; Thomas, J.S.; Berry, D.E. **Pathologic limb fracture attributed to mycobacterial infection in a marine toad, *Bufo marinus*, with systemic mycobacteriosis and chromomycosis.** *Journal of Herpetological Medicine and Surgery*. 2004; 14(3): 19-23. ISSN: 1529-9651

**Descriptors:** captive marine toad, *Bufo marinus*, *Mycobacterium marinum*, *Mycobacterium terrae*, case history, bacilli isolated from liver and kidneys.

## 2003

Antychowicz, J.; Lipiec, M.; Matusiewicz, J. **Infection of African catfish (*Clarias gariepinus*) in an intensive culture facility *Mycobacterium marinum*.** *Bulletin of the European Association of Fish Pathologists*. 2003, 23 (2) 60-66. ISSN: 0108-0288

**Descriptors:** fish diseases, African catfish, case reports, clinical aspects, diagnosis, diagnostic techniques, fish culture, *Clarias gariepinus*, *Mycobacterium marinum*, histopathology, lesions, mortality, postmortem examinations.

Cousins, D.V.; Bastida, R.; Cataldi, A.; Quse, V.; Redrobe, S.; Dow, S.; Duignan, P.; Murray, A.; Dupont, C.; Ahmed, N.; Collins, D.M.; Ray Butler, W.; Dawson, D.; Rodriguez, D.; et al. **Tuberculosis in seals caused by a novel member of the *Mycobacterium tuberculosis* complex: *Mycobacterium pinnipedii* sp. nov.** *International Journal of Systematic and Evolutionary Microbiology*. 2003, 53 (5) 1305-1314. ISSN: 1466-5026.

**NAL Call Number:** 442.8 IN82

**Descriptors:** *Mycobacterium tuberculosis* complex, seal isolates, comparison study, taxonomic relationships, six species of pinnipeds, host preference, phenotypic and genetic tests, disease host range, tapirs, granulomatous lesions, lymph nodes, lungs, pleura, spleen, peritoneum, proposed name for new species, Australia, Argentina, Uruguay, Great Britain, New Zealand.

Harms, C.A.; Howard, K.E.; Wolf, J.C.; Smith, S.A.; Kennedy-Stoskopf, S. **Transforming growth factor-B response to mycobacterial infection in striped bass *Morone saxatilis* and hybrid tilapia *Oreochromis* ssp.** *Veterinary Immunology and Immunopathology*. 2003, 95 (3-4) 155-163. ISSN: 0165-2427.

**NAL Call Number:** SF757.2.V38

**Abstract:** In this study, striped bass and hybrid tilapia were infected with *Mycobacterium marinum*. Using reverse transcription quantitative-competitive PCR, splenic mononuclear cell(SMC) TGF-beta was measures. Infected striped bass SMC-TGF-Bets mRNA expression was lower than controls. In tilapia there as no significant difference between infected and control animals. However, 3 of 10 tilapia, with the most pronounced inflammatory response, showed a decrease in TGF-beta mRNA expression similar to the overall striped bass response to *Mycobacterium* challenge. The authors “suggest that the down regulation of TGF-beta may play a role in dysregulation of the inflammatory response that leads to extensive organ damage in at least one mycobacteria-sensitive fish species.”

**Descriptors:** *Mycobacterium*, bacterial disease of fish, immune response, growth factor-beta, *Morone saxatilis*, *Oreochromis niloticus* x (*mossambicus* x *O. aureus*) effects of inflammatory damage, gross and microscopic pathology.

Dos Santos, N.M.S.; doVale, A.; Sousa, M.J.; Silva, M.T. **Mycobacterial infection in farmed turbot *Scophthalmus maximus*.** *Diseases of Aquatic Organisms*. 2003, 52 (1) 87-91. ISSN: 0177-5103

**Descriptors:** farmed turbot, *Scophthalmus maximus*, piscine tuberculosis, disease prevalence, disease surveys, epidemiological surveys, epidemiology, fish culture, granulomas, histopathology, mixed infections, mortality, new host records, *Mycobacterium chelonae*, *Mycobacterium marinum*, *Nocardia*, water quality.

Niyaz, Ahmed; Mahfooz, Alam; Majeed, A.A.; Rahman, S.A.; Cataldi, A.; Cousins, D.; Hasnain, S.E.; Ahmed, N.; Alam, M. **Genome sequence based, comparative analysis of the fluorescent amplified fragment length polymorphisms (FAFLP) of tubercle bacilli from seals provides molecular evidence for a new species within the *Mycobacterium tuberculosis* complex.** *Infection, Genetics and Evolution*. 2003, 2 (3) 193-199.

**Descriptors:** seals, marine mammals, animal diseases, DNA sequencing, tuberculosis, *Mycobacterium tuberculosis*.

Pasnik, D.J.; Vemulapalli, R.; Smith, S.A.; Schurig, G.G. **A recombinant vaccine expressing a mammalian *Mycobacterium* sp. antigen is immunostimulatory but not protective in striped bass.** *Veterinary Immunology and Immunopathology*. 2003, 95 (1-2) 43-52. ISSN: 0165-2427.

**NAL Call Number:** SF757.2.V38

**Abstract:** A recombinant vaccine was constructed for swine mycobacteriosis using *Brucella abortus* str. RB51 vector expressing *Mycobacterium* sp. 85A antigen. Juvenile striped bass were inoculated with the construct at 5 different dose levels of colony-forming units/fish. Significant specific humoral and cell-mediated responses to the antigen was dose dependent according to blood and tissue samples. Survival studies indicated that inoculated fish failed to demonstrate cross protective responses after a challenge with live *Mycobacterium marinum*.

**Descriptors:** *Morone saxatilis*, striped bass, *Brucella abortus*, genetic engineering, recombinant DNA, recombinant vaccine efficacy, *Mycobacterium marinum*, mammalian strain antigen, lack of cross-protective immune response, bacterial disease of fish.

Pasnik, D.J.; Smith, S.A. **Development of a DNA vaccine for piscine mycobacteriosis.** *GAA (Global Aquaculture Alliance) Advocate*. 2003, 6: 24-25.

**Descriptors:** vaccine development, *Mycobacterium*, bacterial disease of fish, DNA based vaccine, immunity.

Prouty, M.G.; Correa, N.E.; Barker, L.P.; Jagadeeswaran, P.; Klose, K.E. **Zebrafish *Mycobacterium marinum* model for mycobacterial pathogenesis.** *FEMS Microbiology Letters*. 2003, 225 (2) 177-182. ISSN: 0378-1097.

**NAL Call Number:** QR1.F44

**Descriptors:** research pathogenesis model, *Mycobacterium marinum*, zebrafish, *Danio rerio*, similarity to human disease, granuloma-like lesions, inoculum levels.

Rhodes, Martha W.; Kator, Howard; Kotob, Shaban; van Berkum, Peter; Kaattari, Ilsa; Vogelbein, Wolfgang; Quinn, Frederick; Floyd, Margaret M.; Butler, W. Ray; Ottinger, Christopher A. ***Mycobacterium shottsii* sp. nov., a slowly growing species isolated from Chesapeake Bay striped bass (*Morone saxatilis*).** *International Journal of Systematic and Evolutionary Microbiology*. 2003 March; 53 (2) 421-424 ISSN: 1466-5026

**NAL Call Number:** QR1.I577

**Descriptors:** striped bass, *Morone saxatilis*, bacterial diseases of aquatic species, *Mycobacterium shottsii* sp. nov., *Mycobacterium ulcerans*, *Mycobacterium marinum*, new bacterial pathogen, characterization, growth, 16S rRNA gene sequences, isolate M175T (=ATCC 700981T=NCTC 13215T), Chesapeake Bay.

Van Herwijnen, R.; Springael, D.; Slot, P.; Govers, H.A.J.; Parsons, J.R. **Degradation of anthracene by *Mycobacterium* sp. strain LB501T proceeds via a novel pathway, through o-phthalic acid.** *Applied and Environmental Microbiology*. 2003, 69 (1) 186-190. ISSN: 0099-2240.

**NAL Call Number:** 448.3 AP5

**Descriptors:** *Mycobacterium* sp. str. LB501T, wild type, UV generated mutants, anthracene degradation pathway, o-phthalic acid, protocatechuic acid, novel metabolic pathway, biodegradation, catabolism.

Whipps, C.M.; Watral, V.G.; Kent, M.L. **Characterization of a *Mycobacterium* sp. in rockfish, *Sebastes alutus* (Gilbert) and *Sebastes reedi* (Westrheim & Tsuyuki), using rDNA sequences.** *Journal of Fish Diseases*. 2003, 26 (4) 241-245. ISSN: 0140-7775.

**NAL Call Number:** SH171.A1J68

**Descriptors:** *Mycobacterium* sp., rRNA; nucleotide sequence, pathogenic bacteria, *Sebastes alutus*, *Sebastes reedi*, Pacific ocean perch, yellowmouth rockfish.

## 2002

Davis, J.M.; Clay, H.; Lewis, J.L.; Ghori, N.; Herbomel, P.; Ramakrishnan, L. **Real-time visualization of *Mycobacterium*-macrophage interactions leading to initiation of granuloma formation in zebrafish embryos.** *Immunity*. 2002, 17 (6) 693-702.

**Descriptors:** *Danio rerio*, *Mycobacterium marinum*, cell mediated immunity, embryos, experimental infection, granuloma, immune response, macrophage activation, macrophages.

Diamont, A.; Banet, A.; Ucko, M.; Colorni, A.; Knibb, W.; Kvitt, H. **Mycobacteriosis in wild rabbitfish *Siganus rivulatus* association with cage farming in the Gulf of Eilat, Red Sea.** *Diseases of Aquatic Organisms*. 2000, 39 (3) 211-219.

**URL:** <http://www.int-res.com/journals/dao/>

**Descriptors:** *Mycobacterium marinum*, spleen, granuloma, 16S, DNA sequence, coral reef, net sea cages, mariculture,

infection pattern, wild fish.

Drancourt, M.; Jarlier, V.; Raoult, D. **The environmental pathogen *Mycobacterium ulcerans* grows in amphibian cells at low temperatures.** *Applied and Environmental Microbiology*. 2002, 68 (12) 6403-6404. ISSN: 0099-2240. NAL Call Number: 448.3 AP5

**Descriptors:** *Mycobacterium ulcerans*, cell culture, amphibian (XTC-2) cell line, growth characteristics, intracellular presence of bacilli, possible isolation method from environmental sources, PCR, Buruli ulcer.

Hughes, K.P.; Duncan, R.B.; Smith, S.A. **Renomegaly associated with a mycobacterial infection in summer flounder, *Paralichthys dentatus*.** *Fish Pathology*. 2002, p. 83-86.

**Descriptors:** *Mycobacterium*, bacterial disease of fish, renal enlargement, *Paralichthys dentatus*, summer flounder, pathology.

Hughes, K.P.; Duncan, R.B.; Smith, S.A. **Mass (mycobacterial granuloma) in the oral cavity of cultured summer flounder, *Paralichthys dentatus*.** *Lab Animal*. 2002, 31 (3) 25-27. ISSN: 0093-7355. Note: published in the section "What's your diagnosis?" by column editor Thomas, M. Donnelly.

NAL Call Number: QL55.A1L33

**Descriptors:** *Mycobacterium*, *Paralichthys dentatus*, summer flounder, pathology, mouth, granuloma, commercially reared fish, white lobulated lesions, necropsy, wet mount biopsies, culture, histopathology, diagnostic techniques.

Hughes, K.P.; Smith, S.A. **Clinical presentations of *Mycobacterium* sp. in summer flounder (*Paralichthys dentatus*) held in recirculating aquaculture systems.** *Virginia Journal of Science*. 2002, 53 (2) 58. ISSN: 0042-658X.

NAL Call Number: 470 V81

**Descriptors:** *Mycobacterium*, commercially reared, oral masses, lower mandible, head swelling, exophthalmia, coelomic distention, opercular masses, Lowenstein-Jensen and Middlebrook media, acid-fast positive with Ziehl Neelsen staining, etiology, histopathology.

Marsollier, L.; Robert, R.; Aubry, J.; Andre, J.S.; Kouakou, H.; Legras, P.; Manceau, A.; Mahaza, C.; Carbonnelle, B. **Aquatic insects as a vector for *Mycobacterium ulcerans*.** *Applied and Environmental Microbiology*. 2002, 68 (9) 4623-4628. ISSN: 0099-2240.

NAL Call Number: 448.3 AP5

**Descriptors:** *Mycobacterium ulcerans*, emerging environmental pathogen, Buruli ulcers, experimental aquarium model, disease transmission to mice, creeping biting aquatic bugs (Naucoridae) as vectors, insect salivary glands, wild insects, Daloa Region, Ivory Coast, Africa.

Nigou, J.; Dover, L.G.; Besra, G.S. **Purification and biochemical characterization of *Mycobacterium tuberculosis* SuhB, an inositol monophosphatase involved in inositol biosynthesis.** *Biochemistry*. 2002, 41 (13) 4392-4398. ISSN: 0006-2960.

NAL Call Number: 381 B523

**Descriptors:** *Mycobacterium tuberculosis*, *Escherichia coli*, inositol, lipids, magnesium, lithium, SuhB protein, phosphatidylinositol, myo-inositol, inositol monophosphatase, glucitol-6-phosphate, 2'-AMP, glycerol-2-phosphate, biochemical analysis and purification, cloning, cell wall analysis.

Puttinaowarat, S.; Thompson, K.D.; Kolk, A.; Adams, A. **Identification of *Mycobacterium* spp. isolated from snakehead, *Channa striata* (Fowler), and Siamese fighting fish, *Betta splendens* (Regan), using polymerase chain reaction-reverse cross blot hybridization (PCR-RCBH).** *Journal of Fish Diseases*. 2002, 25 (4) 235-244. ISSN: 0140-7775.

NAL Call Number: SH171.A1J68

**Descriptors:** *Mycobacterium* sp., species differentiating techniques, biochemistry, mycolic acid profiles, antibody-based methods, PCR and reverse cross blot hybridization method, 29 isolates, *Mycobacterium fortuitum*, *Mycobacterium marinum*, chevron snakehead, striped snakehead, Siamese fighting fish.

Swanson, C.; Baxa, D.V.; Young, P.S.; Cech, J.J.; Hedrick, R.P. **Reduced swimming performance in delta smelt infected with *Mycobacterium* spp.** *Journal of Fish Biology*. 2002, 61 (4) 1012-1020. ISSN: 0022-1112.

NAL Call Number: QL614.J68

**Descriptors:** delta smelt, *Hypomesus transpacificus*, *Mycobacterium* spp., *Mycobacterium chelonae*, results of

infection, effects on swimming behavior, activity patterns, bioenergetics.

Ucko, M.; Colorni, A.; Kvitt, H.; Diamant, A.; Zlotkin, A.; Knibb, W.R. **Strain variation in *Mycobacterium marinum* fish isolates.** *Applied and Environmental Microbiology*. Nov 2002. 7 (11) 6114-6120 ISSN: 0099-2240

**NAL Call Number:** 448.3 AP5

**Descriptors:** fish pathogen, *Mycobacterium marinum*, genetics, strain variations.

Wick, L.Y.; de Munain, A.R.; Springael, D.; Harms, H. **Responses of *Mycobacterium* sp. LB501T to the low bioavailability of solid anthracene.** *Applied Microbiology and Biotechnology*. 2002, 58 (3) 378-385. ISSN: 0175-7598.

**URL:** <http://link.springer.de/link/service/journals/00253/bibs/2058003/20580378.htm>

**NAL Call Number:** QR1.E9

**Descriptors:** *Mycobacterium*, anthracene, polycyclic aromatic hydrocarbons, biofilms, biodegradation, uptake, adhesion, excretion.

## 2001

Chen, S.C.; Thompson, K.D.; Adams, A.; Richards, R.H. **The production of a lymphokine (macrophage activating factor) by rainbow trout, *Oncorhynchus mykiss* (Walbaum), leucocytes stimulated with the extracellular products of *Mycobacterium* sp.** *Journal of Fish Diseases*. 2001, 24 (4) 217-223. ISSN: 0140-7775.

**NAL Call Number:** SH171.A1J68

**Descriptors:** *Oncorhynchus mykiss*, rainbow trout, immunity, bacterial diseases, macrophage activation factor, head kidney leucocytes, in vitro culture, exposure to extracellular products from *Mycobacterium* cultures, nitrobulle tetrazolium, whole cell preparations, comparison study, vaccination efficiency.

Heckert, R.A.; Elankumaran, S.; Milani, A.; Baya, A. **Detection of a new *Mycobacterium* species in wild striped bass in the Chesapeake Bay.** *Journal of Clinical Microbiology*. 2001. 39 (2) 710-715.

**NAL Call Number:** QR46.J6

**Descriptors:** fish health, isolation of putative new species, skin ulcers and internal granulomas, various organs, *Mycobacterium*, growth, media, unique growth, unique insertional sequence, homology, 87.7% sequence homology to *Mycobacterium ulcerans*, 87.6% homology to *Mycobacterium tuberculosis*, and 85.9% homology to *Mycobacterium*. *Molecular Sequence Data*: GenBank accession number AF257216.

Herbst, L.H.; Costa, S.F.; Weiss, L.M.; Johnson, L.K.; Bartell, J.; Davis, R.; Walsh, M.; Levi, M. **Granulomatous skin lesions in moray eels caused by a novel *Mycobacterium* species related to *Mycobacterium triplex*.** *Infection and Immunity*. 2001, 69 (7) 4639-4646. ISSN: 0019-9567.

**NAL Call Number:** QR1.I57

**Descriptors:** *Mycobacterium*, captive moray eels, histopathology, granulomatous inflammation, dermis fascial plane, rRNA 16S, polymerase chain reaction, experimental transmission was successful.

Latha, M.M.; Chandrika, V. **Sample preparation methods for isolation of *Mycobacterium* spp. from cultured fish and environmental samples.** *Perspectives in Mariculture*. Publisher: Marine Biological Association of India, Cochin (India). 2001. pp. 149-162.

**Descriptors:** *Mycobacterium* sp, bacterial fish pathogen, brackish water fish culture, microbial contamination, sediment sampling, 3 methods evaluated, shaking and membrane filtration methods, acid fast bacterial strain isolation, fish and environmental sampling, Kerala, India.

Kent, M.L.; Watral, V.; Dawe, S.C.; Reno, P.; Heidel, J.R.; Jones, S.R.M. ***Ichthyophonus* and *Mycobacterium*-like bacterial infections in commercially-important rockfish, *Sebastes* spp., in the eastern North Pacific Ocean.** *Journal of Fish Diseases*. 2001, 24 (7) 427-431. ISSN: 0140-7775.

**NAL Call Number:** SH171.A1J68

**Descriptors:** *Mycobacterium* sp., *Ichthyophonus*, bacterial diseases of fish, demersal fish stocks population declines, slope and shelf rockfish fisheries, demersal fish diseases, disease levels in wild stocks, fisheries management, histopathology, etiology, disease survey and detection, disease impact, *Sebastes pinniger*, widow rockfish, rock fishes, *Sebastes flavidus*, *Sebastes entomelas*, *Sebastes reedi*, *Sebastes alutus*, *Sebastes paucispinus*, rockcod, rosefishes,

canary rockfish, Pacific ocean perch, yellowtail rockfish, widow rockfish, yellowmouth rockfish, North Pacific Ocean, Oregon, Washington State, British Columbia.

Morales, P.; Dunker, F. **Fish tuberculosis, *Mycobacterium marinum*, in a group of Egyptian spiny-tailed lizards, *Uromastix aegyptius*.** *Journal of Herpetological Medicine and Surgery*. 2001; 11 (3): 27-30. ISSN: 1529-9651

**Descriptors:** lizards (*Uromastix aegyptius*), *Mycobacterium marinum*, Egypt.

Rhodes, M.W.; Kator, H.; Kotob, S.; Van Berkum, P.; Kaattari, I.; Vogelbein, W.; Floyd, M.M.; Butler, W.R.; Quinn, F.D.; Ottinger, C.; Shotts, E.A. **Unique *Mycobacterium* species isolated from an epizootic of striped bass (*Morone saxatilis*).** *Emerging Infectious Diseases*. 2001, 7 (5) 896-899. ISSN: 1080-6040.

**NAL Call Number:** RA648.5.E46

**Descriptors:** fish diseases, *Mycobacterium* species, taxonomic relationships, *Mycobacterium marinum*, *Mycobacterium ulcerans*, phenotypic characteristics and comparative 16S rRNA gene sequence, striped bass, *Morone saxatilis*, Maryland, Chesapeake Bay.

Roberts, R. J., ed. **The bacteriology of teolosts.** In: *Fish Pathology*, Third Edition. W.B. Saunders, An imprint of Harcourt Publishers Limited, London. 2001, p. 297-331. ISBN: 0-7020-2563-1. Note: A book chapter.

**NAL Call Number:** SH171.F68 2001

**Descriptors:** bacterial diseases of fish, general information, list of 34 pathogens from various families, Gram negative, Gram positive, aerobic and anaerobic species, *Mycobacterium marinum*, *Mycobacterium chelonae*, *Mycobacterium fortuitum*, bacterial isolation, habitat, morphology, culture, epizootiology, clinical pathology, control.

## 2000

Stinear, T.P.; Jenkin, G.A.; Johnson, P.D.R.; Davies, J.K. **Comparative genetic analysis of *Mycobacterium ulcerans* and *Mycobacterium marinum* reveals evidence of recent divergence.** ISSN: 0165-2427. *Journal of Bacteriology*. 2000, 182: 6322-6330. ISSN: 0021-9193.

**NAL Call Number:** 448.3J82

**Descriptors:** *Mycobacterium ulcerans* (18 strains), *Mycobacterium marinum* (22 strains), taxonomic relationships, comparison of 3,306 nucleotides of 8 housekeeping and structural genes, genome sizes, preserved sequences, acquisition and loss of mobile DNA elements.

Torkko, P.; Suomalainen, S.; Iivanainen, E.; Suutari, M.; Tortoli, E.; Paulin, L.; Katila, M.L. ***Mycobacterium xenopi* and related organisms isolated from stream waters in Finland and description of *Mycobacterium botniense* sp. nov.** *International Journal of Systematic and Evolutionary Microbiology*. 2000, 50 (1) 283-289. ISSN: 1466-5026.

**NAL Call Number:** QR1.I577

**Descriptors:** *Mycobacterium*, scotochromogenic organisms, stream water isolates, GLC-MS, biochemical test, internal transcribed spacer sequencing, lipid analysis, unique sequences, characteristics of new species, strains (E347(T) and E43), ATCC strains 700701(T) and 700702.

Torkko, P.; Suomalainen, S.; Iivanainen, E.; Suutari, M.; Tortoli, E.; Paulin, L.; Katila, M.L. ***Mycobacterium xenopi* and related organisms isolated from stream waters in Finland and description of *Mycobacterium botniense* sp. nov.** *International Journal of Systematic and Evolutionary Microbiology*. 2000, 50 (1) 283-289. ISSN: 1466-5026.

**NAL Call Number:** QR1.I577

**Descriptors:** *Mycobacterium*, scotochromogenic organisms, stream water isolates, GLC-MS, biochemical test, internal transcribed spacer sequencing, lipid analysis, unique sequences, characteristics of new species, strains (E347(T) and E43), ATCC strains 700701(T) and 700702.

## 1999

Alito, A.; Romano, M.I.; Bigi, F.; Zumarraga, M.; Cataldi, A. **Antigenic characterization of mycobacteria from South American wild seals.** *Veterinary Microbiology*. Aug 31, 1999. 68 (3/4) 293-299. ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Descriptors:** seals, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium*, antigens, wild animals, strain differences, genetic variation, antibodies, lysis, identification, *Mycobacterium microti*.

Austin, B. **Emerging bacterial fish pathogens.** *Bulletin of the European Association of Fish Pathology.* 1999, 19: 231-234.

**Descriptors:** fish species, various types of fish pathogens, *Mycobacterium* sp.

Bastida, R.; Loureiro, J.; Quse, V.; Bernardelli, A.; Rodriguez, D.; Costa, E. **Tuberculosis in a wild subantarctic fur seal from Argentina.** *Journal of Wildlife Diseases.* 1999. 35 (4) 796-798. ISSN: 0090-3558.

**NAL Call Number:** 41.9 W64B

**Descriptors:** subantarctic fur seal, *Arctocephalus tropicalis*, granulomatous lesions in lungs, pathobiology, *Mycobacterium* complex, case reports, wild animals, Argentina.

Chinabut, S. **Mycobacteriosis and nocardiosis.** In: Woo, P.T.K., Bruno, D.W. *Fish Diseases and Disorders: Volume 3. Viral, Bacterial, and Fungal Infections.* CAB International, New York. 1999. p. 319-340. Note: look chapter.

**NAL Call Number:** SH171.F57 1995 v. 3

**Descriptors:** *Mycobacterium* sp., species of fish affected, geographical distribution, clinical signs, gross pathology, histopathology, characterization and taxonomy, diagnostic methods, disease transmission, control, treatment, pathogenesis and immunity, public health.

Gal, J.; Makrai, L.; Fodor, T.; David, S.; Fodor, L.; Vetesi, F. **Gumokor elofordulasa fogsagban tartott mandarinreeben (*Aix galericulata*).** [Occurrence of tuberculosis in a captive mandarin duck (*Aix galericulata*).] *Magyar Allatorvosok Lapja.* 1999. 121 (6) 367-371. Note: In Hungarian with an English summary.

**NAL Call Number:** 41.8 V644

**Descriptors:** *Mycobacterium avium*, captive duck, case report, tuberculosis, diagnosis, pathology, histology, liver, larynx, spleen, thymus, Hungary.

Holanda, E.D.; Lobato, F.C.F.; Ribeiro, L.P.; Mota, P.M.P.C.; Leite, R.C.; Sampaio, R.; Lima, L.C. **Avaliacao de metodos de descontaminacao para *Mycobacterium fortuitum* em tecido de peixe.** [Available decontamination methods before examination of fishery products for *Mycobacterium fortuitum*.] *Acuicultura '99.* 1999, 1: 275-278. Note: 2. Congreso sur American de Acuicultura. 3. Congreso WAS/LCA. 2. Feria Internacional de Acuicultura. 1. Congreso Nacional de Camaronicultura. 7. Encuentro Nacional de Acuicultura. 1. Encuentro de Genetica, Puerto la Cruz (Venezuela), 17-20 Nov 1999. Cabrera, T.; Jory, D.; Silva, M. (eds). In Portuguese.

**Descriptors:** *Mycobacterium* contaminated tissues, fish and animal specimens, hazardous materials, decontamination chemical treatments, worker protection, comparison study, 0,75% 1-hexadecyl pyridium chloride, 5% oxalic acid, 0,25% benzalkonium chloride, 6% sulfuric acid, toxicity to *Mycobacterium fortuitum*.

Molina, M.; Araujo, R.; Hodson, R.E. **Cross-induction of pyrene and phenanthrene in a *Mycobacterium* sp. isolated from polycyclic aromatic hydrocarbon contaminated river sediments.** *Canadian Journal of Microbiology.* 1999, 45 (6) 520-529. ISSN: 0008-4166.

**NAL Call Number:** 448.8 C162

**Descriptors:** *Mycobacterium*, contaminated rivers sediments, polycyclic aromatic hydrocarbons, biodegradation, pyrene, phenanthrene, pollution effects, bacterial metabolism, cross acclimation.

United Kingdom, British Small Animal Veterinary Association Scientific Committee. **Scientific information document: tuberculosis.** *Journal of Small Animal Practice.* 1999. 40 (3) 145-147.

**NAL Call Number:** 41.8 J8292

**Descriptors:** cattle, reptiles, fishes, amphibians, humans, cats, dogs, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, *Mycobacterium avium*, tuberculosis, zoonoses, pathogenesis, treatment, diagnosis, radiography, histopathology, reviews.

Wolf, J.C.; Smith, S.A. **Comparative severity of experimentally-induced mycobacteriosis in striped bass *Morone saxatilis* and hybrid tilapia *Oreochromis* spp.** *Diseases of Aquatic Organisms.* 1999, 38 (3) 191-200.

**URL:** <http://www.int-res.com/journals/dao/>

**Descriptors:** *Mycobacterium*, bacterial disease of fish, experimental infection, pathology, striped bass, *Morone saxatilis*, hybrid tilapia, *Oreochromis* spp.

Zumarraga, M.J.; Bernardelli, A.; Bastida, R.; Quse, V.; Loureiro, J.; Cataldi, A.; Bigi, F.; Alito, A.; Ramos, M.C.;

Samper, S.; Otal, I.; Martin, C.; Romano, M.I. **Molecular characterization of mycobacteria isolated from seals.** *Microbiology*. 1999. 145 (9) 2519-2526. ISSN: 1350-0872.

**NAL Call Number:** QR1.J64

**Descriptors:** seals, *Arctocephalus australis*, *Arctocephalus tropicalis*, *Otaria flavescens*, *Mycobacterium tuberculosis* complex, RFLP, IS6110 probe, spoligotyping, analysis of 26S rRNA gene sequence, PCR restriction analysis of hsp65, polymorphisms at gyrA codon 95 and katG codon 463, *Mycobacterium bovis*, unique genotypic group, Uruguay, Argentina.

## 1998

Bruno, D.W.; Griffiths, J.; Mitchell, C.G.; Wood, B.P.; Fletcher, Z.J.; Drobniewski, F.A.; Hastings, T.S. **Pathology attributed to *Mycobacterium chelonae* infection among farmed and laboratory-infected Atlantic salmon *Salmo salar*.** *Diseases of Aquatic Organisms*. 1998, 33 (2) 101-109. ISSN: 0177-5103.

**URL:** <http://www.int-res.com/journals/dao/>

**Descriptors:** *Mycobacterium chelonae*, *Salmo salar*, Atlantic salmon, bacterial fish diseases, fish culture, pathology, fish mortality, nodules with acid-fast bacteria, tissue isolates, biochemical tests, lipid analysis and PCR (polymerase chain reaction), Shetland Isles, Scotland.

Chen, Shih-Chu; Adams, A.; Thompson, K.D.; Richards, R.H. **Electron microscope studies of the in vitro phagocytosis of *Mycobacterium* spp. by rainbow trout *Oncorhynchus mykiss* head kidney macrophages.** *Diseases of Aquatic Organisms*. 1998, 32 (2) 99-110. ISSN: 0177-5103.

**URL:** <http://www.int-res.com/journals/dao/>

**Descriptors:** *Mycobacterium* spp., pathogenic bacteria of fish, immunology, head kidney, experimental infections, oral ingestion of pathogens, in vitro suspensions of macrophages, *Oncorhynchus mykiss*, quantitative evaluation of phagocytosis, phagosomes, opsonised with serum and antiserum.

Chen, S-C.; Yoshida, T.; Adams, A.; Thompson, K.D.; Richards, R.H. **Non-specific immune response of Nile tilapia, *Oreochromis niloticus*, to the extracellular products of *Mycobacterium* spp. and to various adjuvants.** *Journal of Fish Diseases*. 1998, 21 (1) 39-46. ISSN: 0140-7775.

**NAL Call Number:** SH171.A1J68

**Descriptors:** *Mycobacterium* spp, *Mycobacterium marinum*, *Oreochromis niloticus*, adjuvants, vaccines, macrophages bladder inoculation, immune response, lysozyme.

Colorni, A.; Avtalion, R.; Knibb, W.; Berger, E.; Colorni, B.; Timan, B. **Histopathology of sea bass (*Dicentrarchus labrax*) experimentally infected with *Mycobacterium marinum* and treated with streptomycin and garlic (*Allium sativum*) extract.** *Aquaculture*. 1998, 160 (1-2) 1-17. ISSN: 0044-8486.

**NAL Call Number:** SH1.A6

**Descriptors:** *Dicentrarchus labrax*, *Mycobacterium marinum*, *Allium sativum*, pathogenic fish diseases, histopathology, serological effects, experimental infection, intraperitoneal injection, granulomata in spleen, treatment with streptomycin and allicin, effects of treatment.

Hunter, J.E.B.; Duigan, P.J.; Dupont, C.; Fray, L.; Fenwick, S.G.; Murray, A. **First report of potentially zoonotic tuberculosis in fur seals in New Zealand.** *New Zealand Medical Journal*. 1998. 111 (1063) 130.

**NAL Call Number:** R99 N4

**Descriptors:** tuberculosis, zoonoses, *Mycobacterium*, fur seals, *Actocephalus fosteri*, zoonotic bacterial disease, New Zealand.

Mohney, L.L.; Poulos, B.T.; Brooker, J.H.; Cage, G.D.; Lightner, D.V. **Isolation and identification of *Mycobacterium peregrinum* from the Pacific white shrimp *Penaeus vannamei*.** *Journal of Aquatic Animal Health*. 1998, 10 (1) 83-88. ISSN: 0899-7659.

**NAL Call Number:** SH181.J68

**Descriptors:** *Mycobacterium peregrine*, *Penaeus vannamei*, whiteleg shrimp, shrimp culture, pathogenic bacteria, multifocal, melanized, nodular lesions of the carapace, new species record for shrimp, potential zoonotic skin disease, disease risks for seafood handlers, negative marketability.

Shehab, M.M. (ed.); El Tahlawy, M.R. (ed.); Mahmoud, M.R. *Eighth Scientific Congress, Faculty of Veterinary Medicine, Assiut University, 15-17 November, 1998*. Assiut; Egypt, Faculty of Veterinary Medicine, Assiut University; 1998. 927 pp. Note: 74 papers.

**Descriptors:** livestock animals, cattle, camels, buffaloes, goats, sheep, rabbits, donkeys, dogs, pigs, mice, poultry, horses, rats, shrimp, many diseases, tuberculosis, brucellosis, aflatoxins, dermatitis, *Mycobacterium*.

Talaat, A.M.; Reimschuessel, R.; Wasserman, S.S.; Trucksis, M. **Goldfish, *Carassius auratus*, a novel animal model for the study of *Mycobacterium marinum* pathogenesis.** *Infection and Immunity*. 1998. 66 (6) 2938-2942.

**NAL Call Number:** QR1.I57

**Descriptors:** goldfish disease model experimental infection, *Mycobacterium marinum*, fish diseases, pathogenesis, tuberculosis, symptoms.

Thorel, M.F.; Karouia, C.; Varnerot, A.; Fleury, C.; Vincent, V. **Isolation of *Mycobacterium bovis* from baboons, leopards and a sea-lion.** *Veterinary Research*. 1998, 29 (2) 207-212. ISSN: 0928-4249.

**NAL Call Number:** SF602.A5

**Descriptors:** *Mycobacterium bovi*, *Otaria byronia*, *Papio hamadryas*, *Panthera uncia*, *Panthera pardus*, *Otaria byrona*, leopard, infection in captive zoo animals, epidemiology using genetics markers, DNA fingerprinting system, strain differentiation, disease control, marine mammals.

United States Animal Health Association. *Proceedings: One Hundred and Second Annual Meeting of the United States Animal Health Association, Minneapolis, Minnesota, USA, 3-9 October, 1998*. Richmond: The Association. 1998. 756 pp.

**NAL Call Number:** 49.9 UN3R

**Descriptors:** livestock, pigs, cattle, bison, horses, llamas, poultry, aquaculture species, wildlife, animal welfare, biotechnology, disease outbreaks, feeds, food safety, international trade, parasitoses, drugs, environment, rabies, bluetongue virus, Retroviridae, *Leptospira*, Aujeszky virus, *Salmonella*, *Mycobacterium bovis*, *Mycobacterium avium* ssp. *paratuberculosis*, USA.

## 1997

Chen, S.-C.; Adams, A.; Thompson, K.D.; Richards, R.H. **A comparison of the antigenicity of the extracellular products and whole-cell sonicates from *Mycobacterium* spp. in rabbits, mice and fish by immunoblotting and enzyme-linked immunosorbent assay.** *Journal of Fish Diseases*. 1997, 20 (6) 427-442. ISSN: 0140-7775.

**NAL Call Number:** SH171.A1J68

**Descriptors:** *Mycobacterium* ssp., *Channa striatus*, *Betta splendens*, chevron snakehead, Siamese fighting fish, mice, rabbits, bacterial fish diseases, antigens, metabolites.

Chen, S.-C.; Adams, A.; Richards, R.H. **Extracellular products from *Mycobacterium* spp. in fish.** *Journal of Fish Diseases*. 1997, 20 (1) 19-25. ISSN: 0140-7775.

**NAL Call Number:** SH171.A1J68

**Descriptors:** *Mycobacterium* ssp., TB1, TB40, TB267 and TB268, *Mycobacterium fortuitum*, *Mycobacterium chelonae*, *Mycobacterium marinum*, food and ornamental fish, isolation and differentiation, cell culture techniques, Long's medium, Eagle's minimum essential medium, Sauton's medium, modified Sauton's medium, extracellular enzymes, pathogenic bacteria, secretory products excretion, enzymes, *Oncorhynchus mykiss*, *Tilapia nilotica*, rainbow trout, Nile mouthbrooder, Thailand.

Chen, Shih-Chu; Adams, A.; Thompson, K.D.; Richards, R.H. **Development of monoclonal antibodies to the extracellular products of *Mycobacterium*, spp. isolated from chevron snakehead and the reference strain *Mycobacterium chelonae*.** *Journal of Aquatic Animal Health*. 1997, 9 (2) 86-98. ISSN: 0899-7659.

**NAL Call Number:** SH181.J68

**Descriptors:** *Channa striat*, *Mycobacterium chelonae*, monoclonal antibodies, pathogenic bacteria therapy, chevron snakehead, striped snakehead, ELISA, Western blot, antigen molecular weights.

Hoel, K.; Lillehaug, A. **Adjuvant activity of polar glycopeptidolipids from *Mycobacterium chelonae* in experimental vaccines against *Aeromonas salmonicida* in salmonid fish.** *Fish & Shellfish Immunology*. 1997, 7 (6)

365-376. ISSN: 1050-4648.

**NAL Call Number:** QL638.97.F55

**Descriptors:** *Mycobacterium chelonae*, *Aeromonas salmonicida*, pathogenic fish bacteria, vaccines, marine fish, boil disease, adjuvant activity, glycopeptidolipids, potential vaccine formulations.

Ramakrishnan, L.; Valdivia, R.H.; McKerrow, J.H.; Falkow, S. ***Mycobacterium marinum* causes both long-term subclinical infection and acute disease in the leopard frog (*Rana pipiens*)**. *Infection and Immunity*. 1997, 65 (2) 767-773. ISSN: 0019-9567.

**NAL Call Number:** QR1. I57

**Descriptors:** *Mycobacterium marinum*, *Rana pipiens*, bacterial species temperature requirements, chronic granulomatous disease, immunocompromised host species, tuberculosis pathogenesis, bacterial disease, disease detection, leopard frog as an animal model.

Smith, S.A. **Mycobacterial infection in pet fish**. *Seminars in Avian and Exotic Pet Medicine*. 1997, 6: 40-45.

**NAL Call Number:** SF994.2.A1S36

**Descriptors:** *Mycobacterium*, exotic fish trade, bacterial disease of fish, pathology, incidence, treatment.

Teska, J.D.; Twerdok, L.E.; Beaman, J.; Curry, M.; Finch, R.A. Isolation of *Mycobacterium abscessus* from Japanese medaka. *Journal of Aquatic Animal Health*. 1997, 9 (3) 234-238. ISSN: 0899-7659.

**NAL Call Number:** SH171.J68

**Descriptors:** Japanese medaka, *Oryzias latipes*, aquatic toxicity testing in animals, *Mycobacterium abscessus*, isolated from whole fish homogenates, culture media and techniques.

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# Primates

## 2007

Greenwald, R.; Lyashchenko, K.; Esfandiari, J.; Stutzman, L.; Gibson, S.; Didier, P.; McCombs, C. **Prima-TB STAT-PAK (R) assay, a novel rapid test for tuberculosis in nonhuman primates.** *American Journal of Primatology*. 2007; 69(Suppl. 1): 120. ISSN: 0275-2565. Note: 30th Annual Meeting of the American Society of Primatologists, Winston-Salem, NC, USA; June 20-23, 2007

**URL:** <http://www3.interscience.wiley.com/cgi-bin/jhome/34629?CRETRY=1&SRETRY=0>

**Descriptors:** *Macaca mulatta*, rhesus macaque, host, *Macaca fascicularis*, cynomolgus macaque, common, host, pathogens, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, bacterial pathogens.

Martino, M; Hubbard, G.B.; Schlabritz-Loutsevitch, N. **Tuberculosis (*Mycobacterium tuberculosis*) in a pregnant baboon (*Papio cynocephalus*).** *Journal of Medical Primatology*. 2007; 36 (2): 108-112

**URL:** <http://www.blackwell-synergy.com/loi/jmp>

**Descriptors:** *Mycobacterium tuberculosis*, *Papio cynocephalus anubis*, captive baboon, case report, clinical picture, diagnostic tests, histological exam of tracheobronchial lymph nodes, latent tuberculosis infection.

## 2006

Freitas, J de A; Ueki, S.Y.M.; Curcio, M.; Tury, E. **Identification of *Mycobacterium tuberculosis* in an outbreak of tuberculosis infection of a *Cebus apella* monkey's colony.** *Revista de Ciencias Agrarias*. 2004; (42): 165-168.

ISSN: 1517-591X. Note: In English with a Portuguese summary.

**Descriptors:** *Cebus paella*, research monkey colony, case report, *Mycobacterium tuberculosis*, sanitary control measures.

Siegal-Willott, J.; Isaza, R.; Fiorello, C.; Reinhard, M. ***Mycobacterium asiaticum* infection in a red-handed tamarin (*Saguinus midas*).** *Journal of Zoo and Wildlife Medicine*. 2006; 37 (3): 413-415. ISSN: 1042-7260

**URL:** <http://www.bioone.org/perlserv/?request=get-archive&issn=1042-7260>

**NAL Call Number:** SF601.J6

**Abstract:** A 4-yr old, intact male red-handed tamarin was evaluated because of a 6-mo history of an enlarging axillary mass. Diagnostic findings included a positive intradermal tuberculin test, 16s ribosomal DNA sequencing, HPLC.

**Descriptors:** monkeys, 4 y/o male, red-handed tamarin (*Saguinus midas*), case study, axillary mass, positive tuberculin test, leukocytoses, hyperglobulinemia, *Mycobacterium asiaticum* isolated.

Singh, T.; Thomas, S.; Baruah, D.K. **Impact of free living macaques (*Macaca mulatta*) on the health of captive animals at the Assam State zoo.** *Zoos' Print*. 2006; 21 (5): 11-12. ISSN: 0971-6378

**URL:** <http://www.zoosprint.org>

**Descriptors:** 144 free living rhesus macaques, tuberculosis testing sputum and blood, throat swabs, 2 positive for *Mycobacterium* spp. Assam Zoo, India.

## 2004

Garcia, Manuel A. Bouley, Donna M. Larson, Michael J.; Lifland, Barry; Moorhead, Roberta ; Simkins, Mikele D.; Borie, Dominic C.; Tolwani, Ravi; Otto, Glen. **Outbreak of *Mycobacterium bovis* in a conditioned colony of rhesus (*Macaca mulatta*) and cynomolgus (*Macaca fascicularis*) macaques.** *Comparative Medicine* (Memphis). 2004; 54 (5): 578-584. ISSN: 1532-0820

**Descriptors:** *Mycobacterium bovis*, disease outbreak, captive colony, rhesus macaques (*Macaca mulatta*), cynomolgus macaques (*Macaca fascicularis*) macaques, natural exposure, species differences in clinical disease, coughing, inappetance, pulmonary lesion, disease effects less in cynomolgus macaques, differences should be considered in developing a screening program, alternative screening methods, PRIMAGAM, ESAT-6 ELISA.

Garcia, M.A.; Yee, J.; Bouley, D.M.; Moorhead, R.; Lerche, N.W. **Diagnosis of tuberculosis in macaques, using whole-blood in vitro interferon-gamma (PRIMAGAM) testing.** *Comparative Medicine*. 2004; 54 (1): 86-92.

ISSN: 1532-0820

**URL:** [http://www.aalas.org/pdfUtility.aspx?pdf=CM/54\\_01\\_10.pdf](http://www.aalas.org/pdfUtility.aspx?pdf=CM/54_01_10.pdf)

**NAL Call Number:** SF77.C65

**Abstract:** During the fall of 2001, a tuberculosis outbreak caused by *Mycobacterium bovis* occurred in a conditioned colony of rhesus (*Macaca mulatta*) and cynomolgus (*Macaca fascicularis*) macaques at Stanford University School of Medicine. During this outbreak, we evaluated the diagnostic performance of a new in vitro tuberculosis screening test (PRIMAGAM). The PRIMAGAM test measures the interferon-gamma (IFN $\gamma$ ) response to purified protein derivatives (PPDs) of *M. bovis* and *M. avium*. On the basis of the results of the last test administered before necropsy, the PRIMAGAM test had good sensitivity (68%) and excellent specificity (97%), compared with the disease status, as determined by the presence or absence of gross and/or histologic lesions indicative of tuberculosis. By contrast, sensitivity and specificity of the tuberculin skin test (TST) was 84 and 87%, respectively. Both tests suffered from intermittent positive and negative reactions on repeat testing. Overall, however, there was no significant difference ( $P = 0.09$ , McNemar's chi<sup>2</sup>-test) and moderate agreement ( $\kappa = 0.52$ ) between these two tests. Lastly, the IFN $\gamma$  response to bovine PPD was significantly lower in infected cynomolgus macaques. Moreover, each test failed to detect tuberculosis in three cynomolgus macaques. Fortunately, they were different animals; therefore, we recommend the parallel use of the TST and PRIMAGAM test for maximal overall sensitivity in a tuberculosis screening program, especially for cynomolgus macaques.

**Descriptors:** *Mycobacterium bovis*, *Macaca fascicularis*, *Macaca mulatta*, laboratory animals, interferons, disease diagnosis, TST and PRIMAGAM test, tuberculosis screening animal health.

Kanaujia, G.V.; Motzel, S.; Garcia, M.A.; Andersen, P.; Gennaro, M.L. **Recognition of ESAT-6 sequences by antibodies in sera of tuberculous nonhuman primates.** *Clinical and Diagnostic Laboratory Immunology*. 2004; 11 (1): 222-226. ISSN: 1071-412X

**Descriptors:** rhesus monkeys, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, ESAT-6 protein, antibody response, experimentally or naturally infected nonhuman primates, epitope level antibodies to overlapping, synthetic peptides, span of ESAT-6 sequence, COOH-terminal portion of protein, possible diagnostic antibody detection assay.

Larson, Jean A, Animal Welfare Information Center (U.S.). **Tuberculosis in animals : *Mycobacterium* bacilli that cause devastating zoonotic diseases in many animals.** *AWIC Resource Series; no. 2004-01*. U.S. Dept. of Agriculture, Agricultural Research Service, National Agricultural Library, Animal Welfare Information Center. Beltsville, MD [2004]

**URL:** <http://www.nal.usda.gov/awic/pubs/TB/TBMain.htm>

**NAL Call Number:** aHV4701.A94 no. 2004-01

**Abstract:** The focus of this publication is on information related to tubercular diseases of animals caused by the bacterial genus *Mycobacterium*. Livestock diseases are mostly caused by *Mycobacterium bovis* and the *Mycobacterium tuberculosis* complex. Many species of animals are included: large ruminants, wildlife, wild animals as disease reservoirs, deer, elephants, birds, fish, etc. Topics are varied and include clinical aspects of the disease, the disease process, disease prevention and control, vaccines, immunology, bacterial genetics, zoonotic aspects, etc. Diseases: tuberculosis in animals, bibliography, *Mycobacterium* sp, *Mycobacterium avium*, *Mycobacterium bovis*, zoonoses, production animals, zoo animals, wild animals, disease control, *Mycobacterium tuberculosis* complex, microbial genetics, disease incidence worldwide, control programs worldwide, immune response, wild animal vectors, treatments, animal disease models, aquatic animals, diagnostic methods, disease pathology, disease incidence worldwide.

## 2003

Goto, S.; Suzuki, J.; Mokuno, Y.; Yanai, T.; Matsubayashi, N.; Miwa, N.; Matsubayashi, K. **Clinical management of tuberculosis infection in nonhuman primates.** *Japanese Journal of Zoo and Wildlife Medicine*. 2003. 8 (1) 35-40.

Note: In Japanese with an English summary.

**Descriptors:** cercopithecoid monkeys, chimpanzees, Rhesus macaques, laboratory animals, tuberculosis outbreaks, 1971-1984, introduced animals as disease reservoirs, drug treatments, Isoniazid and Rifampicin daily/one year,

*Mycobacterium tuberculosis*, Primate Research Institute, Kyoto University, Japan.

Kanaujia, G.V.; Garcia, M.A.; Bouley, D.M.; Peters, R.; Gennaro, M.L. **Detection of early secretory antigenic target-6 antibody for diagnosis of tuberculosis in non-human primates.** *Comparative Medicine*. 2003; 53 (6): 602-606.

ISSN: 1532-0820

**NAL Call Number:** SF77-.C65

**Abstract:** Tuberculosis is one of the most economically devastating, zoonotic infections of captive non-human primates. The limitations of the tuberculin skin test, which is currently used to diagnose tuberculosis in living non-human primates, make it necessary to find new, simple, and economical diagnostic methods. We describe use of an enzyme-linked immunoassay to detect IgG antibodies against early secretory antigenic target (ESAT)-6, a small protein secreted by virulent tubercle bacilli, in paired (pre- and post-outbreak) sera from 57 non-human primates involved in an outbreak of *Mycobacterium bovis* infection in a research colony. Of 25 animals with tuberculosis lesions at necropsy, 22 (88%) had high serum levels of the ESAT-6 antibody. The ESAT-6 antibody was found in 16% (5/32) of post-outbreak sera from animals in which tuberculosis could not be confirmed at necropsy. The strong association between the ESAT-6 antibody and tuberculosis in non-human primates documented in this study, together with the robustness of the serologic assay, make the ESAT-6 ELISA a valuable tool for diagnosis of tuberculosis in captive non-human primates.

**Descriptors:** monkeys, laboratory animals, tuberculosis, *Mycobacterium tuberculosis*, *Mycobacterium bovis*, disease detection, early diagnosis, zoonoses, *Macaca fascicularis*, *Macaca mulatta*, disease outbreaks, quarantine, immunoglobulin G, gene expression.

Yanai, T.; Goto, S.; Mokuno, Y.; Hirata, A.; Sakai, H.; Masegi, T.; Yoshikawa, Y. **Pathology of mycobacteriosis in monkeys.** *Japanese Journal of Zoo and Wildlife Medicine*. 2003. 8 (1) 41-48. Note: In Japanese with an English summary.

**Descriptors:** *Macaca mulatto*, monkeys, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium intracellulare*, animal pathology, clinical aspects, digestive tract mucosa, lesions, liver, lungs, lymph nodes, macrophages, spleen, disease outbreaks, Japan.

## 2001

de Vos, V.; Bengis, R.G.; Kriek, N.P.J.; Michel, A.; Keet, D.F.; Raath, J.P.; Huchzermeyer, H.F.K.A. **The epidemiology of tuberculosis in free-ranging African buffalo (*Syncerus caffer*) in the Kruger National Park, South Africa.** *Onderstepoort Journal of Veterinary Research*. 2001. 68 (2) 119-130.

**NAL Call Number:** 41.8 On1

**Descriptors:** bovine tuberculosis, *Mycobacterium bovis*, African buffalo, *Syncerus caffer*, disease survey results 1990-1996, transmission, infected cattle herds, chacma baboon, *Papio ursinus*, lion *Panthera leo*, cheetah, *Acinonyx jubatus*, kudu, *Tragelaphus strepsiceros*, leopard, *Panthera pardus*.

Kilbourn, A.M.; Godfrey, H.P.; Cook, R.A.; Calle, P.P.; Bosi, E.J.; Bentley-Hibbert, S.I.; Huygen, K.; Andau, M.; Ziccardi, M.; Karesh, W.B. **Serum antigen 85 levels in adjunct testing for active mycobacterial infections in orangutans.** *Journal of Wildlife Diseases*. 2001. 37 (1) 65-71. ISSN: 0090-3558

**NAL Call Number:** 41.9 W64B

**Descriptors:** *Mycobacterium avium*, *Mycobacterium tuberculosis*, *Pongo pygmaeus*, Colorado, Malaysia, USA.

Shrivastav, A.B.; Chaturvedi, V.K.; Jatav, J.; Chaudhary, R.B.; Neithampuii, C. **Tuberculosis in common langur and rhesus macaque.** *Intas Polivet*. 2001; 2 (2): 256. ISSN: 0972-1738

**Descriptors:** *Macaca mulatta*; *Mycobacterium avium*, *Mycobacterium bovis*, case reports, disease transmission, lesions, lungs, mortality, postmortem examinations, respiratory diseases, tuberculosis, zoonoses, Madhya Pradesh, India.

## 2000

Bengis, R.G.; Keet, D.F. **Bovine tuberculosis in the Kruger National Park.** *Proceedings of the North American Veterinary Conference*. [Gainesville, Fla.]. Eastern States Veterinary Association. 2000. v. 14, p. 1034-1036. Note:

Meeting held on January 15-19, 2000. Orlando, Florida.

**NAL Call Number:** SF605.N672

**Descriptors:** Bovidae, *Papio ursinus*, Felidae, *Mycobacterium bovis*, clinical aspects, epidemiology, South Africa.

Keet, D.F.; Kriek, N.P.J.; Bengis, R.G.; Grobler, D.G.; Michel, A. **The rise and fall of tuberculosis in a free-ranging chacma baboon troop in the Kruger National Park.** *Onderstepoort Journal of Veterinary Research*. 2000. 67 (2) 115-122.

**NAL Call Number:** 41.8 On1

**Descriptors:** free ranging chacma baboons, *Papio ursinus*, *Mycobacterium bovis*, feeding on infected animal remains, RFLP analysis, African buffalo, *Syncerus caffer*, apparent disease sources, behavior, infected sleeping places, transmission.

Rensing, Hermann. *Untersuchungen zur Tuberkuloseproblematik unter Verwendung verschiedener Nachweisverfahren in der Totenkopffaffenkolonie des Deutschen Primatenzentrums. [Establishing the incidence of tuberculosis in the German Primate Center squirrel monkey colony using different diagnostic methods.]* Hannover, 2000. 103 p. Note: Thesis (doctoral)--Tierärztliche Hochschule Hannover, 2000. In German with an English summary.

**NAL Call Number:** DISS F2000346

**Descriptors:** diagnosis, laboratory animals, tuberculosis, *Mycobacterium bovis*, *Saimiri sciureus*, Germany.

## 1999

Calle, P.P.; Fowler, M.E. (ed.); Miller, R.E. **Tuberculin responses in orangutans.** *Zoo and Wild Animal Medicine: Current Therapy 4*. Philadelphia, W.B. Saunders. 1999. Ed. 4, p. 392-396.

**NAL Call Number:** SF996 Z66 1999

**Descriptors:** tuberculin, *Mycobacterium*, tuberculosis, *Pongo pygmaeus*, primates, zoo animals, diagnosis.

Hasselschwert, D.L.; Ostrowski, S.R. **An atypical case of *Mycobacterium bovis* in a cynomolgus macaque (*Macaca fascicularis*) imported from the Philippines.** *Contemporary Topics in Laboratory Animal Science*. 1999. 38 (6) 36-38.

**NAL Call Number:** SF405.5 A23

**Descriptors:** *Mycobacterium bovis*, cynomolgus macaque, laboratory animal, case study, Philippines.

Mehrotra, P.K.; Sudhir, Bhargava; Sheela, Chaudhary; Mathur, B.B.L.; Bhargava, S.; Chaudhary, S. **Tuberculosis in a captive Lion-tailed monkey.** *Indian Journal of Comparative Microbiology, Immunology and Infectious Diseases*. 1999. 20 (2) 159.

**Descriptors:** tuberculosis, respiratory diseases, zoo animals, histopathology, pathology, case reports, monkeys, *Mycobacterium*, primates, India.

Rishendra, Verma; Sharma, A.K.; Bhardwaj, K.R.; Verma, R. **Spontaneous disease conditions in monkeys under captivity.** *Indian Journal of Veterinary Research*. 1999. 8 (2) 20-27. Note: In English with a Hindi summary.

**Descriptors:** pathology, laboratory animals, *Macaca*, monkeys, hepatitis, liver diseases, abscesses, tuberculosis.

Verma, R. **Observations on tuberculin testing in monkeys (*Macaca mulatta*).** *Indian Veterinary Journal*. 1999. 76 (1) 962-964.

**NAL Call Number:** 41.8 IN2

**Descriptors:** laboratory animals, *Macaca mulatto*, rhesus monkeys, tuberculin testing, delayed type hypersensitivity, disease prevalence, diagnostic techniques, non-reactive animals.

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## 2007

Dvorska, L.; Matlova, L.; Ayele, W.Y.; Fischer, O.A.; Amemori, T.; Weston, R.T.; Alvarez, J.; Beran, V.; Moravkova, M.; Pavlik, I. **Avian tuberculosis in naturally infected captive water birds of the Ardeideae and Threskiornithidae families studied by serotyping, IS901 RFLP typing, and virulence for poultry.** *Veterinary Microbiology*. 2007; 119 (2/4): 366-374. ISSN: 0378-1135

**URL:** <http://www.sciencedirect.com/science/journal/03781135>

**NAL Call Number:** SF601.V44

**Abstract:** Avian tuberculosis was detected in one flock of 38 water birds of the families Ardeideae (n=20) and Threskiornithidae (n=18). *Mycobacterium avium* subsp. *avium* (MAA, serotype 1, genotype IS901+ and IS1245+) was more often (p=0.01) detected in tissue and/or fecal samples in 18 (90.0%) birds from the Ardeideae family: little egret (*Egretta garzetta*), buff-backed heron (*Bubulcus ibis*), great white egret (*Egretta alba*), and bittern (*Botaurus stellaris*) in comparison to two (11.1%) birds from the Threskiornithidae family: sacred ibis (*Threskiornis aethiopicus*). Avian tuberculosis was not diagnosed in spoonbills (*Platalea leucorodia*). Tuberculous lesions were found in nine birds.

MAA isolates of IS901 RFLP type F-C3 were present in all of the 20 infected birds and in all environmental isolates. A mixed infection with the MAA isolates of three RFLP types F-C3 (tissue isolate), G-C3, and T-C3 (fecal isolates) was found in one sacred ibis. All 20 tissue isolates of IS901 RFLP type F-C3 from 20 birds and 8 environmental MAA isolates were fully virulent in pullets, whilst the isolates of RFLP types G-C3 and T-C3 were non-virulent in pullets.

All of the tested MAA isolates had the same IS1245 RFLP "bird profile". In 12 of 20 infected birds with MAA *M.a. hominissuis* isolates of serotypes 4, 8, 9 and genotype IS901- and IS1245+ were detected and in 8 other birds mycobacteria not belonging to the *M. avium* complex were found. The presence of MAA in the environment may be a source for further spread of the causal agent of avian tuberculosis among other groups of animals in zoological gardens, farm animals, and also among their keepers.

**Descriptors:** bird diseases; wildlife disease reservoirs; Ardeideae family: little egret (*Egretta garzetta*), buff-backed heron (*Bubulcus ibis*), great white egret (*Egretta alba*), and bittern (*Botaurus stellaris*); comparison to two birds of the Threskiornithidae family: sacred ibis (*Threskiornis aethiopicus*); avian tuberculosis not diagnosed in spoonbills (*Platalea*).

## 2006

Amado, A.; Albuquerque, T.; Goncalves, A.; Duarte, E.; Botelho, A.; Fernandes, T.; Bernardino, R.; Lapao, N. **Tuberculosis in mandrills at the Lisbon zoo.** *Veterinary Record* (London). 2006; 159 (19): 643. ISSN: 0042-4900

**URL:** <http://veterinaryrecord.bvapublications.com/archive/>

**NAL Call Number:** 41.8 V641

**Descriptors:** 2 female mandrill baboons (*Mandrillus sphinx*), captive zoo animals, *Mycobacterium tuberculosis*/*M. africanum*, postmortem examinations, pathogen found in lungs and lymph nodes, clinical picture, Lisbon Zoo, Portugal.

Cho, H.S.; Kim, Y.H.; Park, N.Y. **Disseminated mycobacteriosis due to *Mycobacterium avium* in captive Bengal tiger (*Panthera tigris*).** *Journal of Veterinary Diagnostic Investigation*. 2006 May; 18 (3): 312-314. ISSN: 1040-6387

**NAL Call Number:** SF774.J68

**Descriptors:** 2 year old captive zoo animals, *Panthera tigris*, necropsy, granulomas, caseous necrotic areas, clinical picture, anorexia, liver, kidneys, spleen, lungs, macrophages, lymphocytes, granuloma, pathogen identification, feed contamination, disease diagnosis, *Mycobacterium avium* subsp. *avium*, infected culled chickens as feed, Gwangju Uchi Park Zoo, Korea Republic.

Davies, J.L.; Sibley, J.A.; Myers, S.; Clark, E.G.; Appleyard, G.D. **Histological and genotypical characterization of feline cutaneous mycobacteriosis: a retrospective study of formalin-fixed paraffin-embedded tissues.** *Veterinary Dermatology*. 2006; 17 (3): 155-162. ISSN: 0959-4493. Note: In English with German, Spanish and French

summaries.

**URL:** <http://www.blackwell-synergy.com/loi/vde>

**Descriptors:** felines, cutaneous mycobacteriosis, histopathology study, microscopically, hematoxylin, eosin, modified Fite's staining, archived formalin-fixed paraffin-embedded tissue specimens, Actinomycetales, *Mycobacterium* sp., feline leprosy, tuberculosis, clinical picture, Canada, New Zealand, Britain, UK.

Lyashchenko, K.P.; Greenwald, R.; Esfandiari, J.; Olsen, J.H.; Ball, R.; Dumonceaux, G.; Dunker, F.; Buckley, C.; Richard, M.; Murray, S.; Payeur, J.B.; Andersen, P.; Pollock, J.M.; Mikota, S.; Miller, M.; Sofranko, D.; Waters, W.R.

**Tuberculosis in elephants: antibody responses to defined antigens of *Mycobacterium tuberculosis*, potential for early diagnosis, and monitoring of treatment.** *Clinical and Vaccine Immunology*. 2006; 13 (7): 722-732. ISSN: 1556-6811

**URL:** <http://cvi.asm.org/>

**Abstract:** Tuberculosis (TB) in elephants is a re-emerging zoonotic disease caused primarily by *Mycobacterium tuberculosis*. Current diagnosis relies on trunk wash culture, the only officially recognized test, which has serious limitations. Innovative and efficient diagnostic methods are urgently needed. Rapid identification of infected animals is a crucial prerequisite for more effective control of TB, as early diagnosis allows timely initiation of chemotherapy. Serology has diagnostic potential, although key antigens have not been identified and optimal immunoassay formats are not established. To characterize the humoral responses in elephant TB, we tested 143 serum samples collected from 15 elephants over time. These included 48 samples from five culture-confirmed TB cases, of which four were in Asian elephants infected with *M. tuberculosis* and one was in an African elephant with *Mycobacterium bovis*. Multiantigen print immunoassay (MAPIA) employing a panel of 12 defined antigens was used to identify serologic correlates of active disease. ESAT-6 was the immunodominant antigen recognized in elephant TB. Serum immunoglobulin G antibodies to ESAT-6 and other proteins were detected up to 3.5 years prior to culture of *M. tuberculosis* from trunk washes. Antibody levels to certain antigens gradually decreased in response to antitubercular therapy, suggesting the possibility of treatment monitoring. In addition to MAPIA, serum samples were evaluated with a recently developed rapid test (RT) based on lateral flow technology (ElephantTB STAT-PAK). Similarly to MAPIA, infected elephants were identified using the RT up to 4 years prior to positive culture. These findings demonstrate the potential for TB surveillance and treatment monitoring using the RT and MAPIA, respectively.

**Descriptors:** elephants, *Elephas maximus*, *Mycobacterium tuberculosis*, drugs, antibiotic therapy, drug efficacy, immune reactions, serological diagnosis, lack of diagnostic tests, USA.

Manohar, B.M.; Korandi, A.V.; Vairamuthu, S.; Jayathangaraj, M.G.; Kumar, K.S. **Tuberculosis in a bear.** *Indian Veterinary Journal*. 2006; 83 (6): 684-685. ISSN: 0019-6479

**URL:** <http://www.indvetjournal.com>

**NAL Call Number:** 41.8 IN2

**Descriptors:** sloth bears, *Mycobacterium tuberculosis*, case report, clinical picture.

Pavlik, I.; Trcka, I. **Bovinni tuberkuloza u zvirat v Ceske republice a v ostatnich statech stredni Evropy v letech 1990-2004.** [Bovine tuberculosis in animals in the Czech Republic and other Central European countries between 1990 and 2004.] *Veterinarstvi*. 2006; 56 (5): 294-298. ISSN: 0506-8231. Note: In Czech with an English summary.

**Descriptors:** cattle, wild game animals, captive zoo animals, game park, circus, livestock, *Mycobacterium bovis*, *Mycobacterium africanum*, *Mycobacterium canettii*, *Mycobacterium caprae*, *Mycobacterium pinnipedii*, review of published results, Czech Republic, 6 Central European countries.

Pate, M.; Èvara, T.; Gombac, M.; Paller, T.; Zolnir-Dovc, M.; Emer-Üic, I.; Prodinger, W.M.; Barto Ü., M.; Zdovc, I.; Krt, B.; Pavlik, I.; Cvetnic, Z.; Pogacnik, M.; Ocepek, M. **Outbreak of tuberculosis caused by *Mycobacterium caprae* in a zoological garden.** *Journal of Veterinary Medicine B*. 2006 Oct; 53 (8): 387-392. ISSN: 0931-1793

**URL:** <http://dx.doi.org/10.1111/j.1439-0450.2006.01000.x>

**NAL Call Number:** 41.8 Z52

**Abstract:** In the autumn of 2004, tuberculosis caused by *Mycobacterium caprae* occurred in a zoo in Slovenia. A dromedary camel (*Camelus dromedarius*) was killed after a history of progressive emaciation. Necropsy findings indicated disseminated tuberculosis, which was confirmed by cultivation of *M. caprae*. Consequently, a tuberculin skin test was performed in all epidemiologically linked animals and another dromedary camel and six bison (*Bison bison*)

were positive and killed. *Mycobacterium caprae* was isolated from two bison while *M. scrofulaceum* and *Mycobacterium* spp. were found in two other bison, respectively. The second dromedary camel was found to be negative for mycobacteria under both microscopic and culture tests. The isolates were investigated with commercial identification kits, IS6110 PCR, IS6110 restriction fragment length polymorphism analysis, spoligotyping and mycobacterial interspersed repetitive units typing. Genotyping results revealed that the dromedary camel and the two bison were infected by the same *M. caprae*.

**Descriptors:** dromedaries, bison, captive zoo animals, *Mycobacterium bovis* ssp. *caprae*, disease outbreaks, animal pathogenic bacteria, tuberculosis, animal diseases, disease diagnosis, pathogen identification, disease transmission, zoological garden in Slovenia-

Peloquin, C.A.; Maslow, J.N.; Mikota, S.K.; Forrest, A.; Dunker, F.; Isaza, R.; Peddie, L.R.; Peddie, J.; Zhu, M. **Dose selection and pharmacokinetics of rifampin in elephants for the treatment of tuberculosis.** *Journal of Veterinary Pharmacology and Therapeutics*. 2006; 29 (6): 581-585. ISSN: 0140-7783

**URL:** <http://www.blackwell-synergy.com/doi/abs/10.1111/j.1365-2885.2006.00789.x>

**Descriptors:** elephants, *Elephas maximus*, *Loxodonta Africana*, *Mycobacterium tuberculosis*, antibiotic treatment, rifampin, rifamycin amp, dosage, efficacy of treatment.

Rahman, A.Z.; Ahasan, S.A. **Spotted deer (*Cervus axis*) herd in Dhaka Zoo: case report.** *Zoos' Print* . 2006; 21 (12): 14-15. ISSN: 0971-6378

**URL:** <http://www.zoosprint.org>

**Descriptors:** spotted deer (*Cervus axis*) disease survey, pathogens found, *Escherichia coli*, *Mycobacterium*, *Salmonella*, animal behavior, colibacillosis, Dhaka Zoo, Bangladesh.

Singh, T.; Thomas, S.; Baruah, D.K. **Impact of free living macaques (*Macaca mulatta*) on the health of captive animals at the Assam State zoo.** *Zoos' Print*. 2006; 21 (5): 11-12. ISSN: 0971-6378

**URL:** <http://www.zoosprint.org>

**Descriptors:** 144 free living rhesus macaques, tuberculosis testing sputum and blood, throat swabs, 2 positive for *Mycobacterium* ssp. Assam Zoo, India.

## 2005

Lewerin, S.S.; Olsson, S.L.; Eld, K.; Roken, B.; Ghebremichael, S.; Koivula, T.; Kallenius, G.; Bolske, G. **Outbreak of *Mycobacterium tuberculosis* infection among captive Asian elephants in a Swedish zoo.** *Veterinary Record* (London) 2005 Feb 5; 156 (6): 171-175. ISSN: 0042-4900

**NAL Call Number:** 41.8 V641

**Descriptors:** *Elephas maximus*; *Mycobacterium tuberculosis*, zoo animals, disease outbreaks.

Lutze-Wallace, C.; Turcotte, C. **Laboratory diagnosis of bovine tuberculosis in Canada for calendar year 2004.** *Canadian Veterinary Journal*. 2005; 46 7(9): 797-799. ISSN: 0008-5286. Note: In English and French.

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=202>

**NAL Call Number:** 41.8 R3224

**Descriptors:** wild animals, zoo animals, livestock, bison, cattle, *Cervus elaphus*, deer, elephants, equines, cats, bacterial disease, *Mycobacterium*, *Mycobacterium avium*, *Mycobacterium avium* ssp *paratuberculosis*, *Mycobacterium bovis*, *Mycobacterium fortuitum*, *Mycobacterium kansasii*, *Mycobacterium flavescens*, *Mycobacterium triviale*, *Mycobacterium terrae*, red deer, pigs, Suiformes, disease diagnosis, disease surveys, Alberta, British Columbia, Manitoba, Ontario, Quebec, Saskatchewan, Canada.

Maslow, J.N.; Mikota, S.K.; Zhu, M.; Isaza, R.; Peddie, L.R.; Dunker, F.; Peddie, J.; Riddle, H.; Peloquin, C.A.

**Population pharmacokinetics of isoniazid in the treatment of *Mycobacterium tuberculosis* among Asian and African elephants (*Elephas maximus* and *Loxodonta africana*).** *Journal of Veterinary Pharmacology and Therapeutics*. 2005 Feb; 28 (1): 21-27. ISSN: 0140-7783

**NAL Call Number:** SF915.J63

**Abstract:** We recently described the clinical presentation and treatment of 18 elephants from six herds infected with TB. Treatment protocols and methods varied between herds to include both oral and rectal dosing using multiple drug

doses and formulations. In this paper we present information regarding the pharmacokinetics (PK) of isoniazid (INH) in elephants and provide suggestions regarding initial treatment regimens. Forty-one elephants received INH daily by either oral or rectal administration with different formulations. Population PK analysis was performed using Non-linear Mixed Effect Modeling (NONMEM). Results of oral administration indicated that compared with premixed INH solution, the drug exposure was highest with a suspension prepared freshly with INH powder. When INH was concomitantly given as an admixture over food, T(max) was delayed and variability in drug absorption was significantly increased. Compared with oral administration, similar drug exposures were found when INH was dosed rectally. The data generated suggest that a starting dose of 7.5 mg/kg of INH is appropriate for initial TB treatment in elephants when premixed solution is administered directly into the oropharynx or rectal vault and 4 mg/kg are when INH is administered following immediate suspension from powdered form.

**Descriptors:** *Elephas maximus*, *Loxodonta Africana*, isoniazid, pharmacokinetics, *Mycobacterium tuberculosis*; tuberculosis, oral administration, rectum administration, drug therapy, dosage, drug formulations, powders, bacterial infections, rectal administration.

Pavlik, I.; Trcka, I.; Parmova, I.; Svobodova, J.; Melicharek, I.; Nagy, G.; Cvetnic, Z.; Ocepek, M.; Pate, M.; Lipiec, M. **Detection of bovine and human tuberculosis in cattle and other animals in six Central European countries during the years 2000-2004.** *Veterinarni Medicina*. 2005; 50 (7): 291-299. ISSN: 0375-8427

**Descriptors:** cattle, zoo animals, Bactrian camels (*Camelus ferus*) in Czech Republic, a Siberian tiger (*Panthera tigris f. altaica*) in Hungary, a bison (*Bison bison*), an eland (*Taurotragus oryx*) in Poland, a dromedary camel (*Camelus dromedarius*) and two bison in Slovenia, in wild animals, wild boar, wild red deer, European bison, roe deer, skin testing, disease status, *Mycobacterium bovis*, 6 Central European countries, Croatia, the Czech Republic, Hungary, Poland, Slovakia, and Slovenia.

Zhu, M.; Maslow, J.N.; Mikota, S.K.; Isaza, R.; Dunker, F.; Riddle, H.; Peloquin, C.A. **Population pharmacokinetics of pyrazinamide in elephants.** *Journal of Veterinary Pharmacology and Therapeutics*. 2005 Oct; 28(5): 403-409. ISSN: 0140-7783

**NAL Call Number:** SF915.J63

**Descriptors:** *Elephas maximus*; *Loxodonta Africana*, antimicrobial agents, pharmacokinetics, drug therapy, *Mycobacterium tuberculosis*, tuberculosis, drug delivery systems, dosage, oral administration, rectum, rectal administration of drugs, pyrazinamide, nonlinear models, absorption, food deprivation.

## 2003

Lantos, Akos; Niemann, Stefan; Mezosi, Laszlo; Sos, Endre; Erdelyi, Karoly; David, Sandor; Parsons, Linda M.; Kubica, Tanja; Ruesch Gerdes, -Sabine; Somoskovi, Akos. **Pulmonary tuberculosis due to *Mycobacterium bovis* subsp. *caprae* in captive Siberian tiger.** *Emerging Infectious Diseases*. 2003; 9 (11): 1462-1464. ISSN: 1080-6040  
**URL:** <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?linkbar=plain&db=journals&term=1080-6040>

**NAL Call Number:** RA648.5.E46

**Descriptors:** *Mycobacterium bovis* ssp *caprae*, first reported case in captive Siberian tiger, tracheal aspirate by bronchoscopy, case study, reliable procedure.

Somoskovi, A.; Lantos, A.; Mezosi, L.; Sos, E.; Erdelyi, K.; Niemann, S. **Usefulness of bronchoscopy in specimen sampling for bacteriologic testing in captive animals.** *Erkrankungen der Zootiere: Verhandlungsbericht des 41 Internationalen Symposiums über die Erkrankungen der Zoo und Wildtiere Rome, Italy, 28 May-1 June, 2003. Proceedings of the Institute for Zoo and Wildlife Research, Berlin, No.5.* 2003; 267-272. Note: Published by the Institute for Zoo and Wildlife Research. Berlin, Germany.

**Descriptors:** tigers, captive zoo animal, *Mycobacterium bovis* subsp *caprae*, tracheo-bronchial washing, specimen sampling methods, diagnosis of tuberculosis, Germany.

## 2002

Auclair, B.; Mikota, S.K.; Peloquin, C.A.; Aguilar, R.; Maslow, J.N. **Population pharmacokinetics of antituberculous drugs and treatment of *Mycobacterium bovis* infection in bongo antelope (*Tragelaphus eurycerus isaaci*).** *Journal of Zoo and Wildlife Medicine*. 2002. 33 (3) 193-203.

**NAL Call Number:** SF601.J6

**Descriptors:** *Mycobacterium bovis*, tuberculin test, isoniazid, rifampin, drug treatment, efficacy, postmortem examination, pharmacokinetic (PK) data, amikacin (AMK), ethambutol (EMB), INH, pyrazinamide (PZA), RIF, levofloxacin, disease eradication, female bongos, *Tragelaphus eurycerus isaaci*.

Dumonceaux, G.A. ***Mycobacteria tuberculosis in elephants in captivity***. *Proceeding of the North American Veterinary Conference*. 2002. v. 16, 996 pp. Note: In the volume: *Small Animals and Exotics*. Part of a three volume set. Meeting held January 12-16, 2002, Orlando, Florida.

**NAL Call Number:** SF605.N672

**Descriptors:** elephants, *Loxodonta africana*, tuberculosis, *Mycobacterium tuberculosis*.

Pang, FV; Lee, ChiaHao; Chueh, LingLing; Liu, ChenHsuan; Cheng, ChiungHsian; Chiou, HueyIng; Chang, ChihCheng; Fu, YngBin; Chang, ChihHua; Lee, ShuHwae; Chen, MeiIng; Shiao, ChungJung; Chang, ChaoFu; Chi, ChauHaw; Jeng, ChianRen. **Diagnosis and differentiation of mycobacterial infection in formalin-fixed and paraffin-embedded tissues of zoo animals by polymerase chain reaction**. *Taiwan Veterinary Journal*. 2002. 28 (1) 80-87. Note: In Chinese with an English summary.

**NAL Call Number:** SF604 C54

**Descriptors:** animal tissues, diagnosis and identification, differential diagnosis, polymerase chain reaction, PCR, tuberculosis, zoo animals, PCR-TB, Probe TB, PCR-MT, Probe MT, *Mycobacterium bovis*, *Mycobacterium tuberculosis*.

Sternberg, S.; Bernodt, K.; Holmstrom, A.; Roken, B. **Survey of tuberculin testing in Swedish zoos**. *Journal of Zoo and Wildlife Medicine*. 2002, 33: 4, 378-380.

**NAL Call Number:** SF601.J6

**Descriptors:** tuberculin testing, zoo animals, bovine and avian tuberculin compared, diseased tapir, *Tapirus terrestris*, regular testing of zoo animals recommended, Sweden.

## 2001

Langan, J.N.; Adams, W.H.; Patton, S.; Lindermann, K.; Schumacher, J. **Radiation and intralesional chemotherapy for a fibrosarcoma in a boa constrictor, *Boa constrictor ortonii***. *Journal of Herpetological Medicine and Surgery*. 2001; 11 (1): 4-8. ISSN: 1529-9651

**Descriptors:** boa constrictor (*Boa constrictor ortonii*), fibrosarcoma, *Mycobacterium chelonae*.

Mikota, S.K.; Peddie, L.; Peddie, J.; Isaza, R.; Dunker, F.; West, G.; Lindsay, W.; Larsen, R.S.; Salman, M.D.; Chatterjee, D.; Payeur, J.; Whipple, D.; Thoen, C.; Davis, D.S.; Sedgwick, C.; Montali, R.J.; Ziccardi, M.; Maslow, J. **Epidemiology and diagnosis of *Mycobacterium tuberculosis* in captive Asian elephants (*Elephas maximus*)**. *Journal of Zoo and Wildlife Medicine*. 2001. 32 (1) 1-16.

**NAL Call Number:** SF601.J6

**Descriptors:** diagnosis, diagnostic techniques/methods, disease prevalence, ELISA, epidemiology, immunological techniques, tuberculin skin tests, tuberculin, tuberculosis, wild animals, zoo animals, *Elephas maximus*, *Mycobacterium tuberculosis*, Asian elephants, USDA, case histories, six herds, USA.

Montali, R.J.; Mikota, S.K.; Cheng, L.I. ***Mycobacterium tuberculosis* in zoo and wildlife species**. *Revue Scientifique et Technique Office International des Epizooties*. 2001. 20 (1) 291-303. Note: In English with French and Spanish summaries.

**NAL Call Number:** SF781 R4

**Descriptors:** diagnosis, disease survey, prevalence, wild and zoo animals, disease control, zoonotic diseases.

Tanwar, R.K.; Singh, A.P.; Kachawa, S.; Mali, M.M. **Tuberculosis in a spotted deer (*Axis axis*)**. *Intas Polivet*. 2001; 2 (2): 249-250. ISSN: 0972-1738

**Descriptors:** captive zoo animals, spotted deer (*Axis axis*), *Mycobacterium bovis*, clinical aspects, post mortem examination, histopathology, case reports, Rajasthan, India.

## 2000

Larsen, R.S.; Salman, M.D.; Mikota, S.K.; Isaza, R.; Montali, R.J.; Triantis, J. **Evaluation of a multiple-antigen enzyme-linked immunosorbent assay for detection of *Mycobacterium tuberculosis* infection in captive elephants.** *Journal of Zoo and Wildlife Medicine*. 2000. 31 (3) 291-302.

**NAL Call Number:** SF601.J6

**Descriptors:** *Mycobacterium tuberculosis*, captive Asian and African elephants, effective disease management, multi-antigen ELISA screening test, serologic response, zoos, circuses, United States.

Mikota, S.K.; Larsen, R.S.; Montali, R.J. **Tuberculosis in elephants in North America.** *Zoo Biology*. 2000. 19 (5) 393-403. ISSN: 0733-3188

**NAL Call Number:** QL77.5.Z6

**Descriptors:** elephants, tuberculosis infection, disease survey, *Mycobacterium*, North America.

## 1999

Bhat, M.N.; Manickam, R.; Ramkrishna, J. **Screening of captive wild animals for tuberculosis.** *Indian Veterinary Journal*. 1999. 76 (11) 959-961.

**NAL Call Number:** 41.8 IN2

**Descriptors:** elephants, spotted deer, blackbuck, langurs, reliability of test diagnostic tests, tuberculin test, passive hemagglutination test (PHA), wild animals, zoo animals, delayed type hypersensitivity, *Elephas maximus*, antelopes, *Cervus axis*, *Antilope cervicapra*, India.

Cook, R.A.; Fowler, M.E. (ed.); Miller, R.E. ***Mycobacterium bovis* infection of cervids: diagnosis, treatment, and control.** *Zoo and Wild Animal Medicine: Current Therapy 4*. Philadelphia, W.B. Saunders. 1999. Ed. 4, p. 650-657.

**NAL Call Number:** SF996 Z66 1999

**Descriptors:** wild animals, zoo animals, *Mycobacterium bovis*, tuberculosis, diagnosis, treatment, disease control, zoonoses.

Mehrotra, P.K.; Sudhir, Bhargava; Sheela, Chaudhary; Mathur, B.B.L.; Bhargava, S.; Chaudhary, S. **Tuberculosis in a captive Lion-tailed monkey.** *Indian Journal of Comparative Microbiology, Immunology and Infectious Diseases*. 1999. 20 (2) 159.

**Descriptors:** tuberculosis, respiratory diseases, zoo animals, histopathology, pathology, case reports, monkeys, *Mycobacterium*, primates, India.

## 1998

Helman, R.G.; Russell, W.C.; Jenny, A.; Miller, J.; Payeur, J. **Diagnosis of tuberculosis in two snow leopards using polymerase chain reaction.** *Journal of veterinary Diagnostic Investigation*. Jan 1998. 10 (1) 89-92. ISSN: 1040-6387

**NAL Call Number:** SF774 J68

**Descriptors:** *Panthera uncial*, tuberculosis, *Mycobacterium avium*, *Mycobacterium bovis*, *Mycobacterium paratuberculosis*, *Mycobacterium tuberculosis*, diagnosis, polymerase chain reaction, diagnostic techniques, detection, identification, case reports, clinical aspects, symptoms, pathology, histopathology, *Mycobacterium africanum*, *Mycobacterium microti*.

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# Miscellaneous

## 2007

Anonymous; Gicquel, Brigitte; Berthet, Francois-Xavier. ***Mycobacterium* strains with modified erp gene and vaccine composition containing same.** *Official Gazette of the United States Patent and Trademark Office Patents*. 2007.

ISSN: 0098-1133. Note: Patent Number: US 07160548

**Abstract:** *Mycobacterium* strains in which the erp gene is modified, and vaccine compositions comprising such *Mycobacterium* strains are provided. The modification of the erp gene may decrease the virulence and the persistence of the *Mycobacterium* strains.

**Descriptors:** modified *Mycobacterium* strains, erp gene, effect on virulence and persistence.

Harris, N. Beth; Payeur, Janet; Bravo, Doris; Osorio, Ruben; Stuber, Tod; Farrell, David; Paulson, Debra; Treviso, Scarlett; Mikolon, Andrea; Rodriguez-Lainz, Alfonso; Cernek-Hoskins, Shannon; Rast, Robert; Ginsberg, Michele; Kinde, Hailu. **Recovery of *Mycobacterium bovis* from Soft Fresh Cheese Originating in Mexico.** *Applied and Environmental Microbiology (AEM)* 2007 Feb; 73 (3): 1025-1028. ISSN: 0099-2240

**URL:** <http://aem.asm.org/contents-by-date.0.shtml>

**NAL Call Number:** 448.3 Ap5

**Abstract:** Recent outbreaks of human tuberculosis in the United States caused by *Mycobacterium bovis* have implicated cheese originating in Mexico as a source of these infections. A total of 203 samples of cheese originating in Mexico were cultured, and *M. bovis* was recovered from one specimen. Therefore, *M. bovis* can be recovered from cheese and may be a source of human infections.

**Descriptors:** *Mycobacterium bovis*, public health concerns, contaminated Mexican cheese, sick cattle, cattle diseases as potential source of human infection.

Stronen, A.V.; Brook, R.K.; Paquet, P.C.; McLachlan, S. **Farmer attitudes toward wolves: implications for the role of predators in managing disease.** *Biological Conservation*. 2007; 135 (1): 1-10. ISSN: 0006-3207

**URL:** <http://www.sciencedirect.com/science/journal/00063207>

**NAL Call Number:** S900.B5

**Abstract:** The potential for disease transmission between wild and domestic animals may interfere with wildlife and habitat conservation on lands surrounding protected areas. Recently, possible transmission of bovine tuberculosis (*Mycobacterium bovis*) from wild ungulates to domestic livestock has affected the Riding Mountain National Park region in Manitoba, Canada. Wolf (*Canis lupus*) predation on ungulate populations may help lessen the risk of disease transmission to livestock. We conducted an exploratory analysis of causal factors associated with farmer attitudes toward observing wolves on their farms. A survey to 4220 farms within 50 km of the Park resulted in an adjusted response rate of 25%. We constructed several logistic regression models with factors hypothesized to influence whether farmers agreed with the statement "I enjoy seeing wolves on my land", and three candidate models received reasonable support. Factors most affecting attitudes were, in order of importance, perceived wolf population size, frequency of seeing wolves, perceived seriousness of wolf damage, distance to Park boundary and number of beef cattle (*Bos taurus*) owned. The factors least influential on attitudes were education and age. Concern over bovine tuberculosis in wild elk also had minimal influence. Of respondents who perceived the wolf population as "too high", 60% were extremely concerned about bovine tuberculosis in wild elk. Although the role of wolf predation as a potential natural regulator of disease in wild ungulates might not be widely recognized in many areas, we believe this provides a unique opportunity to re-examine the significance of maintaining viable wolf populations..

**Descriptors:** wolves, effects of natural predation on disease status of prey species, *Mycobacterium bovis*; role of viable populations of wolves, Manitoba, Canada.

## 2006

Adaekambi, Toeidi; Ben Salah, Skandar; Khlif, Mohamed; Raoult, Didier; Drancourt, Michel. **Survival of environmental mycobacteria in *Acanthamoeba polyphaga*.** *Applied and Environmental Microbiology (AEM)*. 2006

Sept; 72 (9): 5974-5981. ISSN: 0099-2240

**URL:** <http://aem.asm.org/contents-by-date.0.shtml>

**NAL Call Number:** 448.3 Ap5

**Abstract:** Free-living amoebae in water are hosts to many bacterial species living in such an environment. Such an association enables bacteria to select virulence factors and survive in adverse conditions. Waterborne mycobacteria (WBM) are important sources of community- and hospital-acquired outbreaks of nontuberculosis mycobacterial infections. However, the interactions between WBM and free-living amoebae in water have been demonstrated for only few *Mycobacterium* spp. We investigated the ability of a number (n = 26) of *Mycobacterium* spp. to survive in the trophozoites and cysts of *Acanthamoeba polyphaga*. All the species tested entered the trophozoites of *A. polyphaga* and survived at this location over a period of 5 days. Moreover, all *Mycobacterium* spp. survived inside cysts for a period of 15 days. Intracellular *Mycobacterium* spp. within amoeba cysts survived when exposed to free chlorine (15 mg/liter) for 24 h. These data document the interactions between free-living amoebae and the majority of waterborne *Mycobacterium* spp. Further studies are required to examine the effects of various germicidal agents on the survival of WBM in an aquatic environment.

**Descriptors:** *Acanthamoeba polyphaga* free-living amoebae, survival of *Mycobacterium* in *A. polyphaga* cysts, source of waterborne *Mycobacterium* infections.

Bannalikal, A.S.; Rishendra Verma. **Characterization of *Mycobacterium fortuitum* isolates from animals and their environment by PCR-RFLP analysis (PRA) of hsp65 and rpoB genes.** *Indian Journal of Animal Sciences*. 2006; 76 (2): 109-113. ISSN: 0367-8318

**NAL Call Number:** 41.8 IN22

**Descriptors:** *Mycobacterium fortuitum* I and II, isolates of soil, water, animal tissue, biochemical testing, *Mycobacterium fortuitum*, amplification generated a 439 bp product, RFLP patterns, BSTEII digests, HaeIII digests, MspI digestion, species and subspecies identification.

Bourne, F.J.; Donnelly, C.A.; Cox, D.R.; Gettinby, G.; McInerney, J.P.; Morrison, W.I.; Woodroffe, R. **TB policy and the badger culling trials.** *Veterinary Record* (London). 2006; 158 (19): 671-672. ISSN: 0042-4900

**URL:** [www.bvapublications.com](http://www.bvapublications.com)

**NAL Call Number:** 41.8 V641

**Descriptors:** badgers, cattle, *Mycobacterium bovis*, wildlife as disease reservoirs, culling badgers, disease control policies.

Cole, Stewart; Buchrieser-Brosch, Roland; Gordon, Stephen; Billault, Alain. **Method for isolating a polynucleotide of interest from the genome of a mycobacterium using a BAC-based DNA library: application to the detection of mycobacteria.** *Official Gazette of the United States Patent and Trademark Office Patents*. 2006. ISSN: 0098-1133. Note: This is a description of a patent.

**URL:** <http://www.uspto.gov/go/og/index.html>

**NAL Call Number:** T223.A21

**Abstract:** A method for isolating a polynucleotide of interest that is present in the genome of a first mycobacterium strain and/or is expressed by the first mycobacterium strain, where the polynucleotide of interest is also absent or altered in the genome of a second mycobacterium strain and/or is not expressed in the second mycobacterium. The method includes (a) contacting the genomic DNA of the first mycobacterium strain under hybridizing conditions with the DNA of a least one clone that belongs to a bacterial artificial chromosome (BAC) genomic DNA library of the second mycobacterium strain, and (b) isolating the polynucleotide of interest that does not form a hybrid with the DNA of the second mycobacterium strain. This invention further pertains to a *Mycobacterium tuberculosis* strain H37Rv genomic DNA library, as well as a *Mycobacterium bovis* BCG strain Pasteur genomic DNA library, and the recombinant BAC vectors that belong to those genomic DNA libraries. This invention also relates to mycobacterial nucleic acids, and methods and kits for using these nucleic acids to detect mycobacteria in a biological sample.

**Descriptors:** *Mycobacterium bovis* BCG, *Mycobacterium tuberculosis*, method, isolation of polynucleotide, BAC-based DNA library, detection method, patent.

Courtenay, O.; Reilly, L.A.; Sweeney, F.P.; Hibberd, V.; Bryan, S.; Ul Hassan, A.; Newman, C.; Macdonald, D.W.; Delahay, R.J.; Wilson, G.J.; Wellington, E.M.H. **Is *Mycobacterium bovis* in the environment important for the persistence of bovine tuberculosis?** *Biology Letters*. 2006; 2 (3): 460-462. ISSN: 1744-9561

**URL:** [http://www.pubs.royalsoc.ac.uk/biol\\_lett](http://www.pubs.royalsoc.ac.uk/biol_lett)

**Descriptors:** badgers (*Meles meles*), cattle, *Mycobacterium bovis*, prevalence of pathogen in environment, detectability of *M. bovis*, badger setts and latrines, environmental reservoir, endemic on cattle farms, Britain.

de Araujo, Cristina Pires; Leite, Clarice Queico Fugimura; de Prince, Karina Andrade; Jorge, Klaudia dos Santos Goncalves; Osorio, Ana Luiza Alves Rosa. ***Mycobacterium bovis* identification by a molecular method from post-mortem inspected cattle obtained in abattoirs of Mato Grosso do Sul, Brazil.** *Memorias do Instituto Oswaldo Cruz*. 2005; 100(7): 749-752. ISSN: 0074-0276

**URL:** [http://www.scielo.br/scielo.php/script\\_sci\\_serial/pid\\_0074-0276/lnq\\_en/nrm\\_iso](http://www.scielo.br/scielo.php/script_sci_serial/pid_0074-0276/lnq_en/nrm_iso)

**NAL Call Number:** 448.9 IN74

**Descriptors:** *Mycobacterium bovis*, post-slaughter testing, carcass samples, acid-fast bacilli by Ziehl-Neelsen staining, PCR with primers specific to *Mycobacterium bovis*, *Mycobacterium tuberculosis*, *Mycobacterium* sp., Mato Grosso do Sul, Brazil.

Dietrich, J.; Weldingh, K.; Andersen, P. **Prospects for a novel vaccine against tuberculosis.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4) 163-169. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** The development of a new and improved vaccine against tuberculosis has in the last 10 years been accelerated tremendously from the completed *Mycobacterium tuberculosis* genome and the progress in molecular biology. This has resulted in the identification of a large number of antigens with potential in tuberculosis vaccines. The next phase of this work has now started-putting the most relevant molecules back together as fusion molecules and cocktails. This requires carefully monitoring of aspects as immunodominance, recognition in different populations as well as the influence of different adjuvants and delivery systems. The most advanced of these vaccines such as the fusion between ESAT6 and Ag85B have been evaluated in a range of animal models including non-human primates and are now entering into clinical trials. For these vaccines to be successfully implemented in future vaccination programmes it is necessary to understand the immunological background for the failure of BCG and optimize the vaccines for their ability to boost the immuneresponse primed by BCG.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control, disease control programs, vaccines, vaccination, bacterial antigens, subunit vaccines, genome, microbial genetics, vaccine adjuvants, drug delivery systems, recombinant fusion proteins, animal models, BCG vaccine, epidemiology, immune response, immunodominance.

Fenner, D.C.; Beurge, B.; Kayser, H.P.; Wittenbrink, M.M. **The anti-microbial activity of electrolysed oxidizing water against microorganisms relevant in veterinary medicine.** *Zentralblatt fuer Veterinarmedizin Reihe-B*. 2006 Apr; 53 (3): 133-137. ISSN: 0931-1793

**URL:** <http://dx.doi.org/10.1111/j.1439-0450.2006.00921.x>

**NAL Call Number:** 41.8 Z52

**Abstract:** Standards of the German Association of Veterinary Medicine (DVG) for the evaluation of chemical disinfectants were used to assess the anti-microbial efficacy of electrolysed oxidizing water (EOW). *Enterococcus faecium*, *Mycobacterium avium* subspecies *avium*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Candida albicans* were exposed to anode EOW (pH, 3.0 \* left-pointing-double-angle \* 0.1; oxidation-reduction potential (ORP), +1100 \* left-pointing-double-angle \* 50 mV; free chlorine, 400 \* left-pointing-double-angle \* 20 mg/l Cl subscript 2(B) and combined EOW (7 : 3 anode : cathode, v/v; pH, 8.3 \* left-pointing-double-angle \* 0.1; ORP, 930-950 mV; free chlorine, 271 \* left-pointing-double-angle \* 20 mg/l Cl subscript 2(B)). In water of standardized hardness (WSH), all bacterial strains were completely inactivated by a 30 min exposure to maximum 10.0% anode EOW ([approximately]40.0 mg/l Cl subscript 2(B) or 50.0% combined EOW ([approximately]135.5 mg/l Cl subscript 2(B)). The sensitivity ranking order for anode EOW to the bacterial test strains was *P. mirabilis* > *S. aureus* > *M. avium* ssp. *avium* > *E. faecium* > *P. aeruginosa*. *P. mirabilis* and *S. aureus* decreased to undetectable levels after 5 min of exposure to 7.5% anode EOW ([approximately]30.0 mg/l Cl subscript 2(B)). *Candida albicans* was completely inactivated by a 5-min exposure to 5.0% anode EOW. Both, anode and combined EOW exhibited no anti-microbial activities in standardized nutrient broth or after addition of 20.0% bovine serum to the WSH. Further research is necessary to evaluate the efficacy of EOW as a disinfectant under operating conditions in animal production facilities.

**Descriptors:** cattle, animal pathogens, disinfectants, antimicrobial agents, oxidants, chlorine, duration, nutrient

solutions, blood serum, water hardness, *Enterococcus faecium*, *Mycobacterium avium* subsp. *avium*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, electrolysed oxidizing water, oxidation resistance, anodes, cathodes.

Food and Agriculture Organization. **Capacity building for surveillance and control of zoonotic diseases, FAO/WHO/OIE Expert and Technical Consultation, Rome, 14-16 June 2005.** *FAO Animal Production and Health Proceedings*. 2006; (7): 112 pp. ISSN: 1810-0732

**URL:** <http://www.fao.org>

**Abstract:** This proceeding contains 14 papers. This publication is intended to assist veterinary public health services in Developing Countries and countries in transition in the implementation of capacity-building programmes on surveillance and control of zoonotic diseases. Specific recommendations were made on implementation of surveillance methodologies for zoonotic diseases. There is a special emphasis on Developing Countries. The topics include: recommendations for training programs in surveillance methodologies at veterinary and para-veterinary levels; surveillance program in taeniasis/cysticercosis; capacity building for the surveillance, prevention and control of BSE; control of zoonotic disease under emergency conditions; surveillance and control programs in brucellosis, *Mycobacterium bovis*, tuberculosis, anthrax, salmonellosis and other foodborne pathogens; surveillance, early weaning and early reaction to zoonoses outbreaks; and surveillance approaches in antimicrobial resistance.

**Descriptors:** animal health, training programs, disease surveillance programs, major bacterial diseases, parasites, *Burcella*, *Mycobacterium bovis*, BSE, Developing Countries.

Freeman, R.; Geier, H.; Weigel, K.M.; Do, J.; Ford, T.E.; Cangelosi, G.A. **Roles for cell wall glycopeptidolipid in surface adherence and planktonic dispersal of *Mycobacterium avium*.** *Applied and Environmental Microbiology*. 2006; 72 (12): 7554-7558. ISSN: 0099-2240

**URL:** <http://aem.asm.org>

**NAL Call Number:** 448.3 AP5

**Abstract:** The opportunistic pathogen *Mycobacterium avium* is a significant inhabitant of biofilms in drinking water distribution systems. *M. avium* expresses on its cell surface serovar-specific glycopeptidolipids (ssGPLs). Studies have implicated the core GPL in biofilm formation by *M. avium* and by other *Mycobacterium* species. In order to test this hypothesis in a directed fashion, three model systems were used to examine biofilm formation by mutants of *M. avium* with transposon insertions into *pstAB* (also known as *nrp* and *mps*). *pstAB* encodes the nonribosomal peptide synthetase that catalyzes the synthesis of the core GPL. The mutants did not adhere to polyvinyl chloride plates; however, they adhered well to plastic and glass chamber slide surfaces, albeit with different morphologies from the parent strain. In a model that quantified surface adherence under recirculating water, wild-type and *pstAB* mutant cells accumulated on stainless steel surfaces in equal numbers. Unexpectedly, *pstAB* mutant cells were >10-fold less abundant in the recirculating-water phase than parent strain cells. These observations show that GPLs are directly or indirectly required for colonization of some, but by no means all, surfaces. Under some conditions, GPLs may play an entirely different role by facilitating the survival or dispersal of nonadherent *M. avium* cells in circulating water. Such a function could contribute to waterborne *M. avium* infection..

**Descriptors:** *Mycobacterium avium* complex, biofilms, waterborne pathogen infection, DNA insertion elements, insertion sequences, lipids, mobile genetic elements, mobile sequences, PVC, transposons.

Hervas-Stubbs, Sandra; Majlessi, Laleh; Simsova, Marcela; Morova, Jana; Rojas, Marie-Jesus; Nouz\_e, Clemence; Brodin, Priscille; Sebo, Peter; Leclerc, Claude. **High frequency of CD4<sup>+</sup> T cells specific for the TB10.4 protein correlates with protection against *Mycobacterium tuberculosis* infection.** *Infection and immunity (IAI)*. 2006; 74: (6): 3396-3407. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** TB10.4 is a newly identified antigen of *Mycobacterium tuberculosis* recognized by human and murine T cells upon mycobacterial infection. Here, we show that immunization with *Mycobacterium bovis* BCG induces a strong, genetically controlled, Th1 immune response against TB10.4 in mice. BALB/c and C57BL/6 strains behave as high and low responders to TB10.4 protein, respectively. The TB10.4:74-88 peptide was identified as an immunodominant CD4<sup>+</sup> T-cell epitope for H-2d mice. Since recent results, as well as the present study, have raised interest in TB10.4 as a subunit vaccine, we analyzed immune responses induced by this antigen delivered by a new vector, the adenylate cyclase (CyaA) of *Bordetella pertussis*. CyaA is able to target dendritic cells and to deliver CD4<sup>+</sup> or CD8<sup>+</sup> T-cell epitopes to the major histocompatibility complex class II/I molecule presentation pathways, triggering

specific Th1 or cytotoxic T-lymphocyte (CTL) responses. Several CyaA harboring either the entire TB10.4 protein or various subfragments containing the TB10.4:20-28 CTL epitope were shown to induce TB10.4-specific Th1 CD4<sup>+</sup> and CD8<sup>+</sup> T-cell responses. However, none of the recombinant CyaA, injected in the absence of adjuvant, was able to induce protection against *M. tuberculosis* infection. In contrast, TB10.4 protein administered with a cocktail of strong adjuvants that triggered a strong Th1 CD4<sup>+</sup> T-cell response induced significant protection against *M. tuberculosis* challenge. These results confirm the potential value of the TB10.4 protein as a candidate vaccine and show that the presence of high frequencies of CD4<sup>+</sup> T cells specific to this strong immunogen correlates with protection against *M. tuberculosis* infection.

**Descriptors:** mice, *Mycobacterium bovis*, *Mycobacterium tuberculosis*, TB10.4, newly identified antigen, possible vaccination candidate, immune response in mice, CD4<sup>+</sup> T cells, CD8<sup>+</sup> T cells.

Hicks, D.J.; Johnson, L.; Mitchell, S.M.; Gough, J.; Cooley, W.A.; La-Ragione, R.M.; Spencer, Y.I.; Wangoo, A.

**Evaluation of zinc salt based fixatives for preserving antigenic determinants for immunohistochemical demonstration of murine immune system cell marker.** *Biotechnic and Histochemistry*. 2006; 81(1): 23-30. ISSN: 1052-0295

**URL:** <http://www.informaworld.com/smpp/title~content=t713692932>

**NAL Call Number:** QH613.B56

**Descriptors:** immunohistochemical techniques antigen, cytokine and cytomorphological markers; fixatives; mouse models for *Mycobacterium bovis* infection; tissues from RIII mice; zinc salt fixative; buffered formalin; tested CD3, CD4, CD8, CD45, CD54, F4/80, Interferon-gamma, MIP2.

Johnston, A.M. **The 1901 Congress on Tuberculosis: John McFadyean and beyond.** *Veterinary Microbiology*. 2006; 112 (2/4): 347-368. ISSN: 0378-1135. Note: Special issue: S.J.More, More; J.D. Collins; E. Gormley; M. Good; R.A. Skuce; J.M. Pollock (editors). *Proceedings of the 4th International Conference on Mycobacterium bovis, Dublin, Ireland, 22-26 August 2005*.

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** *Mycobacterium bovis*, cattle, humans, historical congress discussed, disease transmission, epidemiology, tuberculin testing.

Moda, G. **Non-technical constraints to eradication: the Italian experience.** *Veterinary Microbiology*. 2006 Feb. 25; 112 (2-4): 253-258. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on *Mycobacterium bovis*, Held August 22-26, 2005, Dublin, Ireland.

**URL:** [www.sciencedirect.com/science/journal/03781135](http://www.sciencedirect.com/science/journal/03781135)

**NAL Call Number:** SF601.V44

**Abstract:** Although technical constraints to eradication of bovine tuberculosis are well-recognized, non-technical constraints can also delay progress towards eradication, leading to inefficiency and increased programme costs. This paper seeks to analyze the main non-technical constraints that can interfere with the successful implementation of tuberculosis eradication plans, based on experiences from an area of high tuberculosis prevalence in Regione Piemonte, Italy. The main social and economic constraints faced in the past 20 years are reviewed, including a social reluctance to recognize the importance of seeking eradication as the goal of disease control, effective communication of technical issues, the training and the organization of veterinary services, the relationship between the regional authority and farmers and their representatives, and data management and epidemiological reporting. The paper analyses and discusses the solutions that were applied in Regione Piemonte and the benefits that were obtained. Tuberculosis eradication plans are one of the most difficult tasks of the Veterinary Animal Health Services, and non-technical constraints must be considered when progress towards eradication is less than expected. Organizational and managerial resources can help to overcome social or economic obstacles, provided the veterinary profession is willing to address technical, but also non-technical, constraints to eradication.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control, disease control programs, disease prevalence, pathogen eradication, economic analysis, economic costs, social behavior, social barriers, veterinarians, social environment, Italy.

More, S.J.; Collins, J.D.; Gormley, E.; Good, M.; Skuce, R.A.; Pollock, J.M. **4th International Conference on Mycobacterium bovis: workshop reports.** *Veterinary Microbiology*. 2006; 112 (2/4): 383-391. ISSN: 0378-1135.

Note: Special issue: S.J. More; J.D. Collins; E. Gormley; M. Good; R.A. Skuce; J.M. Pollock (editors). *Proceedings of the 4th International Conference on Mycobacterium bovis, Dublin, Ireland, 22-26 August 2005.*

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Descriptors:** conference workshop reports, policy, strategy, *Mycobacterium bovis*, disease control, disease eradication programs, diagnosis, molecular epidemiology, wild animals as disease reservoirs, vaccines, vaccination of animals, cattle, livestock.

Osek, J. **Zoonozy i ich czynniki etiologiczne w krajach Unii Europejskiej oraz w Norwegii w 2004 r. [Zoonoses and their etiological agents in European Union countries and Norway in 2004.]** *Zycie Weterynaryjne.* 2006; 81 (3): 180-187. Note: In Polish.

**URL:** [http://www.vetpol.org.pl/index.php?option=com\\_content&view=article&id=59&Itemid=61](http://www.vetpol.org.pl/index.php?option=com_content&view=article&id=59&Itemid=61)

**Descriptors:** zoonotic disease incidence, *Brucella*, *Campylobacter*, *Echinococcus*, *Escherichia coli*, *Listeria*, *Mycobacterium bovis*, rabies virus, *Salmonella*, *Toxoplasma*, *Trichinella*, *Yersinia*, EU countries.

Pignone, Michelle; Greth, Kimberly M.; Cooper, Jason; Emerson, David; Tang, Jane. **Identification of mycobacteria by matrix-assisted laser desorption ionization-time-of-flight mass spectrometry.** *Journal of Clinical Microbiology.* 2006 June; 44 (6): 1963-1970. ISSN: 0095-1137

**URL:** <http://jcm.asm.org/cgi/content/full/44/6/1963>

**NAL Call Number:** QR46 .J6

**Abstract:** Classical methods for identification of *Mycobacterium* species rely on morphology and biochemical profiles. Speciation of a *Mycobacterium* isolate using these standard methods is a lengthy process based on subjective data interpretation. In this study, *Mycobacterium* species were characterized by utilizing matrix-assisted laser desorption ionization-time-of-flight mass spectrometry (MALDI-TOF MS). This technology is designed to provide a characteristic mass spectral fingerprint based on desorbed ions from the cell surface. Thirty-seven strains were analyzed; these represented thirteen species and five subspecies that included the *Mycobacterium tuberculosis* complex and the *M. avium M. intracellulare* complex, as well as rapid- and slow-growing mycobacteria. All 37 strains were analyzed in triplicate, and a database was generated. This method produced species-specific patterns for all but 1 of the 37 isolates and provided reliable differentiation at the strain level. The data suggest that whole-cell MALDI-TOF MS has potential as a rapid and reproducible method for the identification and characterization of *Mycobacterium* species.

**Descriptors:** *Mycobacterium*, species identification, mass spectrometry methods and techniques, mass spectral fingerprint, desorbed ions from cell surface, species specific patterns, *Mycobacterium* identification method.

Radunz, B. **Surveillance and risk management during the latter stages of eradication: experiences from Australia.** *Veterinary Microbiology.* 2006 Feb 25; 112(2-4): 283-290. ISSN: 0378-1135. Note: Paper presented at the 4th International Conference on Mycobacterium bovis, Held August 22-26, 2005, Dublin, Ireland

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** The paper reviews the eradication of bovine tuberculosis from Australia with special reference to surveillance and managing the risk of animals exposed to tuberculosis infected animals during the latter stages of eradication. The successful eradication was based on a sound technical program with strong industry and government support. The model of joint industry and government funding and decision-making first used during the brucellosis and tuberculosis eradication campaign (BTEC) has been successfully incorporated within subsequent livestock disease control programs in Australia. An overview of the history of tuberculosis eradication in Australia provides a background to the surveillance approach. Australia was fortunate that there were no wildlife reservoir hosts. Feral animal reservoir hosts were removed during the eradication program. Surveillance to detect rare diseases is recognized to be statistically challenging with high resource requirements. Australian veterinary authorities have a high level of confidence that the combination of increasing sensitivity of abattoir surveillance systems by the submission of all granulomas detected at slaughter with increasing risk management of animals exposed to tuberculosis infected animals during the final stages of eradication provides a high level of assurance that *Mycobacterium bovis* has been eradicated.

**Descriptors:** cattle, *Mycobacterium bovis*, animal pathogenic bacteria, bovine tuberculosis, literature reviews, disease control programs, disease outbreaks, disease transmission, risk management, disease surveillance, decision making, agricultural history, wildlife, animal diseases, tuberculosis, disease reservoirs, slaughter houses, meat inspection, pathogen eradication, culling animals, Australia

Reynolds, D. **TB policy developments.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 5-10. ISSN: 0269-5545  
**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle, *Mycobacterium bovis*, badgers (*Meles meles*), eradication and control programs, lessons learned, disease distribution, zoonotic infections, UK.

Richter, Elvira; Reusch Gerdes, Sabine; Hillemann, Doris. **Evaluation of the genotype *Mycobacterium* assay for identification of mycobacterial species from cultures.** *Journal of Clinical Microbiology*. 2006 May; 44 (5): 1769-1775. ISSN: 0095-1137

**URL:** <http://jcm.asm.org/cgi/content/full/44/5/1769>

**NAL Call Number:** QR46 .J6

**Abstract:** A new commercially available DNA strip assay (GenoType *Mycobacterium* CM/AS; Hain Lifescience, Nehren, Germany) was evaluated for the ability to differentiate mycobacterial species. The test is based on a PCR technique targeting a 23S rRNA gene region, followed by reverse hybridization and line probe technology. The GenoType CM is capable of identifying 23, the GenoType AS a further 14, species either alone or in combination with one or more species. Both tests were evaluated with 156 mycobacterial strains composed of 61 validly published species including different subspecies, 6 not validly published species, and 3 strains other than mycobacterial species. All strains were precharacterized by sequencing of the 5' region of the 16S rRNA gene and biochemical tests. In total, results for 151 strains were interpretable. Concordant results were obtained for 137 (92.6%) of 148 mycobacterial strains with the CM assay and 133 (89.9%) of 148 mycobacterial strains with the AS assay, and all three non-*Mycobacterium* species were identified.

**Descriptors:** *Mycobacterium* species, 2 diagnostic test strips, culture testing,

Rothschild, B.M.; Laub, R. **Hyperdisease in the late Pleistocene: validation of an early 20th century hypothesis.** *Naturwissenschaften*. 2006; 93 (11): 557-564. ISSN: 0028-1042

**URL:** <http://www.springerlink.com/link.asp?id=100479>

**Abstract:** The hypothesis of disease-related large mammal extinction has new support. A unique pathologic zone of resorption in 52% of metacarpals and metatarsals was first noticed in a 113 skeletons of Hiscock *Mammot americanum* metacarpals. There was also associated rib periosteal reaction that is suggestive of tuberculosis. Foot lesions were identical to that documented in *Bison* as pathognomonic for tuberculosis. The high frequency of the pathology in *M. americanum* suggests that tuberculosis was pandemic, a hyperdisease. Such pandemic tuberculosis could have been one of several factors contributing to mastodon extinction.

**Descriptors:** paleozoology, fossils, mammals, *Mycobacterium tuberculosis*, bacterial infections in feet bones, bacterioses, bone destruction, *Mammot americanum*, Pleistocene era.

Shah, N.P.; Singhal, A.; Jain, A.; Kumar, P.; Uppal, S.S.; Srivatsava, M.V.P.; Prasad, H.K. **Occurrence of overlooked zoonotic tuberculosis: detection of *Mycobacterium bovis* in human cerebrospinal Fluid.** *Journal of Clinical Microbiology*. 2006 Apr; 44 (4): 1352-1358. ISSN: 0095-1137

**URL:** <http://jcm.asm.org/cgi/content/full/44/4/1352>

**NAL Call Number:** QR46 .J6

**Abstract:** The paucibacillary nature of the cerebrospinal fluid (CSF) has been a major obstacle in the diagnosis of human tuberculous meningitis (TBM). This study shows that with molecular techniques direct precise determination to the species level of mycobacterial pathogens can be made. The present report describes the utility of a nested PCR (N-PCR) assay (A. Mishra, A. Singhal, D. S. Chauhan, V. M. Katoch, K. Srivastava, S. S. Thakral, S. S. Bharadwaj, V. Sreenivas, and H. K. Prasad, *J. Clin. Microbiol.* 43:5670-5678, 2005) in detecting *M. tuberculosis* and *M. bovis* in human CSF. In 2.8% (6/212) of the samples, *M. tuberculosis* was detected, and in 17% (36/212), *M. bovis* was detected. Mixed infection was observed in 22 samples. Comparative analysis of clinical diagnosis, smear microscopy, and N-PCR in 69 patients (TBM, 25; non-TBM, 44) showed that the sensitivity of N-PCR (61.5%) was greater than that of smear microscopy (38.4%). Determination to the species level is important from the viewpoint of determining the prevalence of these mycobacteria in a community and would influence strategies currently adopted for the prevention of tuberculosis.

**Descriptors:** *Mycobacterium bovis*, nested PCR assay, pathogen identification, cerebrospinal fluid testing, human tissue.

Slinina, K.N.; Lazovskaya, A.L. Vorob'eva, Z.G.; Kul'chitskaya, M.A.; Druchkova, M.V. **A method for storage of cultures in the laboratory.** *Russian Agricultural Sciences*. 2006; (12): 24-25. ISSN: 1068-3674. Note: Translated

journal.

**NAL Call Number:** S1.S68

**Descriptors:** storage methods, bacterial species, *Escherichia coli*, *Enterococcus faecalis*, *Mycobacterium smegmatis*, *Mycobacterium avium* strains, preservation of biochemical characteristics and properties.

Sweeney, F.P.; Courtenay, O.; Ul Hassan, A.; Hibberd, V.; Reilly, L.A.; Wellington, E.M.H. **Immunomagnetic recovery of *Mycobacterium bovis* from naturally infected environmental samples.** *Letters in Applied Microbiology*. 2006 Oct; 43 (4): 364-369. ISSN: 0266-8254

**URL:** <http://dx.doi.org/10.1111/j.1472-765X.2006.01983.x>

**NAL Call Number:** QR1.L47

**Abstract:** To adapt an immunomagnetic capture (IMC) technique to concentrate and cultivate *Mycobacterium bovis* from environmental samples including soil, faeces and urine. Cells of *Myco. bovis* BCG and wild-type *Myco. bovis* were successfully isolated and cultured from seeded and naturally infected materials respectively. The IMC cell recovery estimated by colony forming units (CFUs) counts ranged from 0\* diaeresis \*10% to 0\* diaeresis \*16% for spiked media, and 0\* diaeresis \*15-0\* diaeresis \*36% for naturally infected soil and faeces. Recovery estimated by cell counts calculated using semi-quantitative PCR ranged from 80\* diaeresis \*3% to 88\* diaeresis \*6% for spiked and 84\* diaeresis \*1-88\* diaeresis \*2% for naturally infected material. The differences in the recovery rates estimated by CFUs compared with pixel intensity is likely to be due to clustering of cells on culture plates, thereby underestimating the true cell count. The IMC techniques can be applied to isolate viable wild type *Myco. bovis* from naturally contaminated environmental samples. Cultivation of *Myco. bovis* from environmental samples using traditional methods is extremely problematic. Here, we demonstrate a novel development of IMC techniques that will greatly facilitate the study of the organism in situ in order to assess its epidemiological importance in bovine tuberculosis persistence.

**Descriptors:** *Mycobacterium bovis*, immunomagnetic capture technique, concentrate and cultivate bacteria, environmental sampling, soil, feces, urine, pathogen persistence.

UK Department for Environment Food and Rural Affairs. **Special Issue: Bovine TB.** *GVJ-Government Veterinary Journal*. 2006; 16 (1): 91 pp. ISSN: 0269-5545. Note: Special issue contains 10 articles on TB.

**URL:** <http://www.defra.gov.uk/gvs/publications/gvj/pdf/gvj-vol1701.pdf> (PDF | 731KB)

**Descriptors:** cattle, other species, *Mycobacterium bovis*, TB disease levels and distribution, TB policies, disease modeling, Bovigam assay, antemortem diagnosis, tuberculin skin test, zoonotic infections, control programs, issues limiting eradication, EC, USA, Africa, Canada, New Zealand, EU.

Vordermeier, M.; Hewinson, R.G. **Development of cattle TB vaccines in the UK.** *Veterinary Immunology and Immunopathology*. 2006; 112 (1/2): 38-48. ISSN: 0165-2427

**URL:** <http://www.sciencedirect.com/science/journal/01652427>

**NAL Call Number:** SF757.2.V38

**Descriptors:** bovine tuberculosis, cattle, *Mycobacterium bovis*, House of Commons Environment, Food and Rural Affairs Committee's report on Bovine TB (2004), findings of the Independent Scientific Group Vaccine Scoping Subcommittee, vaccine as control solution, vaccine development, DNA or protein subunit vaccines with BCG vaccine, Britain, UK.

Waddington, K. **The Bovine Scourge: Meat, Tuberculosis and Public Health, 1850-1914.** Boydell Press. Suffolk, UK2006; i-ix + 226 pp. ISBN: 1843831937. Note: A book with 10 chapters on the topic of meat and TB.

**NAL Call Number:** SF967.T8 W33 2006

**Descriptors:** bovine tuberculosis, public health, food safety concerns, meat from infected cattle, transmissibility between species and humans, meat inspection, eradication, etc.

## 2005

Fend, R.; Geddes, R.; Lesellier, S.; Vordermeier, H.M.; Corner, L.A.L.; Gormley, E.; Costello, E.; Hewinson, R.G.; Marlin, D.J.; Woodman, A.C.; Chambers, M.A. **Use of an electronic nose to diagnose *Mycobacterium bovis* infection in badgers and cattle.** *Journal of Clinical Microbiology*. 2005; 43 (4): 1745-1751. ISSN: 0095-1137

**URL:** <http://jcm.asm.org/cgi/content/abstract/43/4/1745>

**NAL Call Number:** QR46.J6

**Abstract:** It is estimated that more than 50 million cattle are infected with *Mycobacterium bovis* worldwide, resulting

in severe economic losses. Current diagnosis of tuberculosis (TB) in cattle relies on tuberculin skin testing, and when combined with the slaughter of test-positive animals, it has significantly reduced the incidence of bovine TB. The failure to eradicate bovine TB in Great Britain has been attributed in part to a reservoir of the infection in badgers (*Meles meles*). Accurate and reliable diagnosis of infection is the cornerstone of TB control. Bacteriological diagnosis has these characteristics, but only with samples collected postmortem. Unlike significant wild animal reservoirs of *M. bovis* that are considered pests in other countries, such as the brushtail possum (*Trichosurus vulpecula*) in New Zealand, the badger and its sett are protected under United Kingdom legislation (The Protection of Badgers Act 1992). Therefore, an accurate in vitro test for badgers is needed urgently to determine the extent of the reservoir of infection cheaply and without destroying badgers. For cattle, a rapid on-farm test to complement the existing tests (the skin test and gamma interferon assay) would be highly desirable. To this end, we have investigated the potential of an electronic nose (EN) to diagnose infection of cattle or badgers with *M. bovis*, using a serum sample. Samples were obtained from both experimentally infected badgers and cattle, as well as naturally infected badgers. Without exception, the EN was able to discriminate infected animals from controls as early as 3 weeks after infection with *M. bovis*, the earliest time point examined postchallenge. The EN approach described here is a straightforward alternative to conventional methods of TB diagnosis, and it offers considerable potential as a sensitive, rapid, and cost-effective means of diagnosing *M. bovis* infection in cattle and badgers..

**Descriptors:** *Mycobacterium bovis* detection, electronic nose, badgers (*Meles meles*), cattle, sero testing.

Kubica, T.; Ruesch-Gerdes, S.; Niemann, S. **Human *Mycobacterium bovis* ssp *bovis* and ssp *caprae* tuberculosis cases in Germany.** *Infection*. 2005; 33 (3): 197. ISSN: 0300-8126. Note: Meeting abstract. 8th Congress of Infectious Diseases and Tropical Medicine, Hamburg, Germany; June 09 -11, 2005.

**URL:** <http://www.springerlink.com/content/1439-0973/>

**Descriptors:** *Mycobacterium bovis* ssp *bovis*, *Mycobacterium bovis* ssp *caprae*, zoonotic animal pathogen, human infection, epidemiology, pyrazinamide 98-96-4, antibacterial drug, anti-infective drug, spoligotype patten, cluster rate, geographical prevalence.

Mackowiak, Philip A.; Blos, Vera Tiesler; Aguilar, Manuel; Buikstra, Jane E. **On the origin of American tuberculosis.** *Clinical Infectious Diseases*. 2005; 41 (4): 515-518,507. ISSN: 1058-4838

**Descriptors:** humans, animals, tuberculosis in the US, pre-Columbian infection status, *Mycobacterium tuberculosis* or *Mycobacterium bovis*, history of the disease, USA.

Mahendra-Pal **Importance of zoonoses in public health.** *Indian Journal of Animal Sciences*. 2005; 75 (5): 586-591. ISSN: 0367-8318

**NAL Call Number:** 41.8 IN22

**Descriptors:** cattle, humans, wild animals, *Mycobacterium bovis*, *Yersinia pestis*, zoonotic diseases, animal diseases, disease prevalence, control programs, disease prevention, epidemiology, human diseases, morbidity, mortality, plague, public health, sanitation, hygiene, zoonoses, Gujarat, Maharashtra, India, USA.

Mays, Simon A. **Tuberculosis as a zoonotic disease in antiquity.** In: Davies J.; Fabis M.; Mainland I; Richards M.; Thomas R. *Diet and Health in Past Animal Populations: Current Research and Future Directions*. Oxbow books, Oxford, UK. 2005; 125-134. ISBN: 1842171178. Note a book chapter from the 9th Conference of the International Council of Archaeozoology (ICAZ), Durham, England; August 23 -28, 2002.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, zoonotic pathogen, pathogen prevalence, domestic animals, humans, levels in early human populations, documentary and archaeological evidence.

Mellor, D.J.; Russell, A.M.; Wood, J.L.N. (Editors). **Society for Veterinary Epidemiology and Preventive Medicine. Proceedings of a Meeting Held at Nairn, Inverness, Scotland, 30th March-1st April 2005.** Published by the Society. 2005. 277 pp. ISBN: 0948073691.

**Descriptors:** many papers, topics include animals diseases, epidemiology, disease prevalence, disease transmission and spread, disease control and prevention, diagnosis, reservoir hosts, public health aspects, bovine tuberculosis, *Mycobacterium bovis*, classical swine fever, rabies, pancreatic necrosis virus, foot and mouth disease, avian influenza A virus, *Streptococcus suis*, *Escherichia coli*, *Campylobacter*, *Salmonella* spp., *Ostertagia ostertagi*, broilers, domestic livestock, wild animal disease carriers, UK.

Meyer, S.; Naumann, L.; Landthaler, M.; Vogt, T. **Lupus vulgaris caused by *Mycobacterium bovis* ssp *caprae*.**

*British Journal of Dermatology*. 2005; 153 (1): 220-222. ISSN: 0007-0963

**Descriptors:** *Mycobacterium bovis* ssp. *caprae*, zoonotic disease, human skin disease, etiology, lupus vulgaris.

Schuebel, N.; Rupp, J.; Kramme, E.; Gottschalk, S.; Zabel, P.; Dalhoff, K. **Six cases of *Mycobacterium bovis* infections in northern Germany between 1999 and 2004.** *Infection*. 2005; 33 (3): 215. ISSN: 0300-8126. Note: Meeting abstract. 8th Congress of Infectious Diseases and Tropical Medicine, Hamburg, Germany; June 09 -11, 2005

**Descriptors:** *Mycobacterium bovis*, humans, zoonotic disease, epidemiology, Germany.

Vordermeier, H.M.; Chambers, M.A.; Buddle, B.M.; Pollock, J.M.; Hewinson, R.G. **Progress in the development of vaccines and diagnostic reagents to control tuberculosis in cattle.** *Veterinary Journal*. 2006 Mar; 171 (2): 229-244. ISSN: 1090-0233

**URL:** <http://dx.doi.org/10.1016/j.tvjl.2004.11.001>

**NAL Call Number:** SF601.V484

**Abstract:** The sharp rise of bovine tuberculosis (TB) in Great Britain and the continuing problem of wild life reservoirs in countries such as New Zealand and Great Britain have resulted in increased research efforts into the disease. Two of the goals of this research are to develop (1) cattle vaccines against TB and (2) associated diagnostic reagents that can differentiate between vaccinated and infected animals (differential diagnosis). This review summarizes recent progress and describes efforts to increase the protective efficacy of the only potential TB vaccine currently available, *Mycobacterium bovis* BCG, and to develop specific reagents for differential diagnosis. Vaccination strategies based on DNA or protein subunit vaccination, vaccination with live viral vectors as well as heterologous prime-boost scenarios are discussed. In addition, we outline results from studies aimed at developing diagnostic reagents to allow the distinction of vaccinated from infected animals, for example antigens that are not expressed by vaccines like *Mycobacterium bovis* Bacille-Calmette-Guerin, but recognised strongly in *Mycobacterium bovis* infected cattle.

**Descriptors:** cattle, bovine tuberculosis, *Mycoplasma bovis*, drugs, vaccine development, literature reviews, *Mycobacterium bovis* BCG, BCG vaccine, live vaccines, subunit vaccines, disease detection, analytical methods, reagents, laboratory techniques, immunologic techniques, serodiagnosis, *Mycobacterium tuberculosis* complex .

Young, Jamie-S.; Gormley, Eamonn; Wellington, Elizabeth M. H. **Molecular detection of *Mycobacterium bovis* and *Mycobacterium bovis* BCG (Pasteur) in soil.** *Applied and Environmental Microbiology*. 2005; 71 (4): 1946-1952. ISSN: 0099-2240

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=83>

**NAL Call Number:** 448.3 Ap5

**Abstract:** PCR primers specific for the *Mycobacterium tuberculosis* complex were used to detect the presence of *Mycobacterium bovis* BCG (Pasteur) in soil microcosms and *Mycobacterium bovis* in environmental samples taken from a farm in Ireland with a history of bovine tuberculosis. *M. bovis* genes were detected in soil at 4 and 21 months after possible contamination. Gene levels were found in the range of  $1 \times 10^3$  to  $3.6 \times 10^3$  gene copies g of soil-1, depending on the sampling area. Areas around badger setts had the highest levels of detectable genes and were shown to have the highest levels of gene persistence. *M. bovis*-specific 16S rRNA sequences were detected, providing evidence of the presence of viable cells in Irish soils. Studies of DNA turnover in soil microcosms proved that dead cells of *M. bovis* BCG did not persist beyond 10 days. Further microcosm experiments revealed that *M. bovis* BCG survival was optimal at 37°C with moist soil (-20 kPa; 30% [vol/wt]). This study provides clear evidence that *M. bovis* can persist in the farm environment outside of its hosts and that climatic factors influence survival rates.

**Descriptors:** *Mycobacterium bovis*, environmental sampling of soils, PCR primers, areas of badger setts had highest levels of gene persistence, 10 day persistence, optimal conditions, Ireland.

Zumarraga, M.J.; Meikle, V.; Bernardelli, A.; Abdala, A.; Tarabla, H.; Romano, M.I.; Cataldi, A. **Use of touch-down polymerase chain reaction to enhance the sensitivity of *Mycobacterium bovis* detection.** *Journal of Veterinary Diagnostic Investigation*. 2005; 17 (3): 232-238. ISSN: 1040-6387

**URL:** <http://jvdi.org/>

**NAL Call Number:** SF774.J68

**Descriptors:** *Mycobacterium bovis*, PCR, detection, diagnosis, sensitivity of testing.

## 2004

Abalos, P.; Retamal, R. **Tuberculosis: ¿una zoonosis re-emergente? [Tuberculosis: a re-emerging zoonosis?]**

*Revue Scientifique et Technique Office International des Epizooties*. 2004; 23(2): 583-594. ISSN: 0253-1933. Note: In Spanish.

**Descriptors:** *Mycobacterium bovis*, zoonotic disease, prevention and control of the disease needed, human and animal health efforts, more effective diagnostic techniques and effective vaccines, issues in developing countries, resistant strains, spread of HIV, wild animals as disease reservoirs.

Adcock, V.; Durr, P.A. **Use of scalable vector graphics for a web-delivered interactive digital atlas of bovine tuberculosis.** *GISVET' 04: Second International Conference on the Applications of GIS and Spatial Analysis to Veterinary Science, University of Guelph, Ontario, Canada, 23<sup>rd</sup> 25<sup>th</sup> June*. 2004: 22-25. ISBN: 189951323X. Note: Published by Veterinary Laboratories Agency. Addlestone, UK.

**Abstract:** Scalable vector graphics (SVG) is a new XML-based web technology combining high quality graphics, enhanced browser-based interactivity and rapid load times. This technology is useful for the production of interactive disease maps. The author describes its use for the successful implementation of an historical atlas of bovine tuberculosis in England and Wales, by permitting direct map production from the source data without requiring intermediate processing within a GIS.

**Descriptors:** *Mycobacterium tuberculosis*, computer programs, generating interactive disease maps, England.

Bengis, R.G.; Leighton, F.A.; Fischer, J.R.; Artois, M.; Morner, T.; Tate, C.M. **The role of wildlife in emerging and re-emerging zoonoses.** *Revue Scientifique et Technique Office International des Epizooties*. 2004; 23 (2): 497-511. ISSN: 0253-1933. ISBN: 9290446218.

Note: Alternate title--**Emerging zoonoses and pathogens of public health concern**. In English with Spanish and French summaries.

**Descriptors:** zoonotic diseases, humans and animal diseases, wild animals, public and animal health concerns, disease reservoir, disease hosts, *Mycobacterium bovis*, leptospirosis, Lyme disease, monkeypox, plague, rabies, Rift Valley fever, tuberculosis, tularaemia, West Nile, avian influenza virus, *Borrelia burgdorferi*, *Brucella*, Coronavirus, Ebola virus, *Ehrlichia chaffeensis*, *Ehrlichia phagocytophila*, *Francisella tularensis*, Hantavirus, HIV, SIV, *Leptospira interrogans*, Lyssavirus, Marburg virus, Paramyxovirus Rift Valley fever virus, *Yersinia pestis*, *Ehrlichia ewingii*, ehrlichiosis, Hendra virus, Nipah virus, SARS coronavirus, severe acute respiratory syndrome, world wide.

Hammer, P. **Heat inactivation of classical mycobacteria in milk - a historical review.** *Bulletin of the International Dairy Federation*. 2004; (392): 42-48. ISSN: 0250-5118. Note: International workshop on "Revisiting Heat Resistance of Microorganisms in Milk, Kiel, Germany, 5-8 May 2003."

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium tuberculosis*, bacterial inactivation in milk, high temperature short time pasteurization, research variables in articles, food contamination, food safety, bacterial heat tolerance, historical literature review.

Imberechts, H.; Dierick, K. **Report on zoonotic agents in Belgium in 2002.** 2004. 65p.

**Descriptors:** zoonoses, zoonotic agents, living animals, animal diseases, animal based foods, humans, zoonotic tuberculosis, brucellosis, salmonellosis, trichinellosis, rabies, *Campylobacter*, echinococcosis, listeriosis, yersiniosis, verotoxin producing *Escherichia coli*, cysticercosis, foodborne diseases, animal diseases, cysticerci, food safety, *Listeria*, *Salmonella*, trichinosis, Belgium.

Jing, Wang; Shuhan, Sun; Zhenlin, Hu; Fengjuan, Zhou; Yiling, Ling. **Ion-exchange chromatography method for the purification of genomic DNA fraction from *Mycobacterium bovis* Bacillus Calmette-Guerin.** *Journal of Chromatography B*. 2004; 811 (2): 103-107. ISSN: 1570-0232

**URL:** <http://www.sciencedirect.com/science/journal/03784347>

**Descriptors:** purification process for genomic DNA from *Mycobacterium bovis* Bacillus Calmette-Guerin, ion-exchange chromatography, multistep process, sonication, heating, trypsin digestion, ion exchange chromatography, gel-filter chromatography, lyophilization.

Koo, Hye Cheong; Park, Yong Ho; Ahn, Jongsam; Waters, W. Ray; Hamilton, Mary Jo; Barrington, George; Mosaad, Abdelaziz A.; Palmer, Mitch V.; Shin, Sang; Davis, William C. **New latex bead agglutination assay for differential diagnosis of cattle infected with *Mycobacterium bovis* and *Myobacterium avium* subsp. *paratuberculosis*.** *Clinical and Diagnostic Laboratory Immunology*. 2004; 11 (6): 1070-1074. ISSN: 1071-412X

**URL:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=524750>

**Descriptors:** cattle, identification of animals infected with *Mycobacterium bovis*, *Mycobacterium avium* subsp. *paratuberculosis*, current assays not sensitive and specific to identify diseased animals, latex bead agglutination assay (LBAA) using specific immunodominant epitope (ESAT6-p) of *M. bovis*, compared assay to culture method and skin test, experimental infection and non-infected animals, species specific diagnosis, sera testing, data suggest a rapid, sensitive and specific assay can be developed.

Pasquali, P. (Paolo). Food and Agriculture Organization of the United Nations. **HIV infections and zoonoses.** *FAO Animal Production and Health Paper ; 163.* 2004. 31p. ISBN: 9251051690 (pbk.). Note: chapter titles: HIV and the immune system. Zoonoses and AIDS. Tuberculosis due to *Mycobacterium bovis*. Enteric infection due to *Salmonella* and *Campylobacter*. Toxoplasmosis. Cryptosporidiosis. Giardiasis. Microsporidiosis. Fungal infections.

**NAL Call Number:** SF1.F64 no. 163

**Abstract:** Infections between animals and humans are truly complex, and health care providers should be aware of the potential role of animals in infectious diseases of HIV-infected patients. The aim of this guideline is to outline the most important zoonoses that play a significant role in the epidemiology of AIDS and to provide a practical and manageable tool for health workers involved in the care of HIV infected humans.

**Descriptors:** various zoonotic diseases, *Mycobacterium bovis*, infection potential for immune challenged people, HIV, animals as disease reservoirs.

Savey, M.; Dufour, B. **Diversite des zoonoses. Definitions et consequences pour la surveillance et la lutte.** [Diversity of zoonosis. Definitions and consequences for their surveillance and control.] *Epidemiologie et Sante Animale.* 2004; (46): 1-16. ISSN: 0754-2186. ISBN: 2840390779. Note: In French with an English abstract.

**URL:** <http://aeema.vet-alfort.fr/public/pdf/revue/46.02.pdf>

**Descriptors:** humans, animals, re-emergent diseases, cowpox virus, *Mycobacterium bovis*, public health decisions, disease control, disease surveys, neurocysticercosis, zoonoses, definitions, reservoir, reservoir host, incidental host, liaison host, reviews.

Shkaeva, N.A. **Spread of bovine tuberculosis in a radiocontaminated area of Chelyabinsk Oblast.** *Russian Agricultural Sciences.* 2004; (4): 30-32. ISSN: 1068-3674. Note: Translated from *Doklady Rossiiskoi Akademii Sel'skokhozyaistvennykh Nauk* (2004) No. 2: 41-43 (Ru). publisher is AllertonPress, Inc, NY, NY

**Descriptors:** cattle, bovine tuberculosis, *Mycobacterium bovis*, relationship between epizootic situation and local radioactive waste contamination, soil pollution, study 1984-2002, high level of disease, remedial measures taken, positive relationship between disease and contamination, Russia.

UK, Department for Environment Food and Rural Affairs. **Zoonoses Report United Kingdom 2003.** Published by the Department of Environment, Food and Rural Affairs (DEFRA). 2004; 71 ISBN: 0855211407

**URL:** <http://www.defra.gov.uk>

**Descriptors:** humans cattle, livestock, avian influenza, bovine spongiform encephalopathy, Creutzfeldt Jakob disease, disease prevalence, disease surveys, disease transmission, epidemiology, foodborne diseases, vector borne diseases, waterborne diseases, West Nile fever, *Borrelia*, *Campylobacter*, *Cryptosporidium*, *Escherichia coli*, Hantavirus, *Leptospira*, *Listeria*, *Mycobacterium bovis*, *Salmonella*, *Streptococcus*, *Toxocara*, *Toxoplasma*, *Trichinella*, zoonoses, UK.

Waters, W.R.; Palmer, M.V.; Nonnecke, B.J.; Whipple, D.L.; Horst, R.L. ***Mycobacterium bovis* infection of vitamin D-deficient NOS2-/- mice.** *Microbial Pathogenesis.* 2004; 36 (1): 11-17. ISSN: 0882-4010

**NAL Call Number:** QR175.M53

**Descriptors:** mice, animal models, *Mycobacterium bovis*, vitamin D, vitamin deficiencies, tuberculosis, mice.

Wei, Cheng Yu; Hsu, Yung Hsiang; Chou, Wen Jen; Lee, Chan Ping; Tsao, Wen Long. **Molecular and histopathologic evidence for systemic infection by *Mycobacterium bovis* in a patient with tuberculous enteritis, peritonitis, and meningitis: A case report.** *Kaohsiung Journal of Medical Sciences.* 2004; 20 (6): 302-307. ISSN: 1607-551X

**Descriptors:** *Mycobacterium bovis*, zoonotic bacterial pathogen, man consumed fresh deer blood and unpasteurized deer's milk, clinical presentation, acute abdominal pain, tuberculosis enteritis, and colon perforation, PCR assay and single strand conformation polymorphism assay, oral route of infection.

Yesilkaya, Hasan; Barer, Michael R.; Andrew, Peter W. **Antibiotic resistance may affect alkali decontamination of**

**specimens containing mycobacteria.** *Diagnostic Microbiology and Infectious Disease.* 2004; 50 (2): 153-155. ISSN: 0732-8893

**URL:** [http://www.elsevier.com/wps/find/journaldescription.cws\\_home/505759/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/505759/description#description)

**Descriptors:** genetic modification, mycobacteria, *Mycobacterium bovis* BCG wild type, isogenic mutant strain, killing effect of sodium hydroxide, NaOH, denaturing effect was more severe on the genetically modified strain.

## 2003

Fischer, O.A.; Matlova, L.; Bartl, J.; Dvorska, L.; Svastova, P.; du Maine, R.; Melicharek, I.; Bartos, M.; Pavlik, I.

**Earthworms (Oligochaeta, Lumbricidae) and mycobacteria.** *Veterinary Microbiology.* 2003. 91 (4) 325-338.

ISSN: 0378-1135

**NAL Call Number:** SF601.V44

**Descriptors:** cattle, goats, earthworms, disease transmission, disease vectors, disease reservoirs, epidemiology, feces, livestock, *Lumbricus rubellus*, *Mycobacterium avium*, *Mycobacterium avium* subsp. *paratuberculosis*, *Mycobacterium abscessus*, *Mycobacterium gastri*, *Mycobacterium scrofulaceum*.

Fischer, O.A.; Matlova, L.; Dvorska, L.; Svastova, P.; Pavlik, I. **Nymphs of the Oriental cockroach (*Blatta orientalis*) as passive vectors of causal agents of avian tuberculosis and paratuberculosis.** *Medical and Veterinary Entomology.* June 2003. 17 (2) 145-150. ISSN: 0269-283X

**NAL Call Number:** RA639.M44

**Descriptors:** cockroach, *Blatta orientalis*, transmission of bacteria, *Mycobacterium avium*, nymphs role as passive disease vectors.

Howard, C.J.; Charleston, B.; Stephens, S.A.; Sopp, P.; Hope, J.C. **The role of dendritic cells in shaping the immune response.** *Animal Health Research Reviews.* 2004; 5 (2): 191-195. Note: Proceedings of the 3rd International Veterinary Vaccines and Diagnostics Conference, University of Guelph, Canada, 13-18 July 2003.

**Descriptors:** cattle, livestock, dendritic cells, immune responses, stimulating naïve T cells, adaptive immunity, in vivo, ex-vivo, subpopulations of myeloid dendritic cells, cytokines, vaccination, *Mycobacterium bovis*.

King, G.M. **Uptake of carbon monoxide and hydrogen at environmentally relevant concentrations by mycobacteria.** *Applied and Environmental Microbiology.* 2003; 69(12): 7266-7272. ISSN: 0099-2240

**URL:** <http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=83>

**NAL Call Number:** 448.3 Ap5

**Abstract:** Liquid culture assays revealed a previously unreported capacity for *Mycobacterium bovis* BCG, *M. gordonae*, and *M. marinum* to oxidize CO and for *M. smegmatis* to consume molecular hydrogen. *M. bovis* BCG, *M. gordonae*, *M. smegmatis*, and *M. tuberculosis* H37Ra oxidized CO at environmentally relevant concentrations (<50 ppm); H<sub>2</sub> oxidation by *M. gordonae* and *M. smegmatis* also occurred at environmentally relevant concentrations (<10 ppm). CO was not consumed by *M. avium* or *M. microti*, although the latter appeared to possess CO dehydrogenase (CODH) genes based on PCR results with primers designed for the CODH large subunit, coxL. *M. smegmatis* and *M. gordonae* oxidized CO under suboxic (10 and 1% atmospheric oxygen) and anoxic conditions in the presence of nitrate; no oxidation occurred under anoxic conditions without nitrate. Similar results were obtained for H<sub>2</sub> oxidation by *M. smegmatis*. Phylogenetic analyses of coxL PCR products indicated that mycobacterial sequences form a subclade distinct from that of other bacterial coxL, with limited differentiation among fast- and slow-growing strains..

**Descriptors:** various *Mycobacterium* species, strain differences, ability to oxidize carbon monoxide, bacterial biochemistry, hydrogen, uptake mechanisms, *Mycobacterium avium*, *Mycobacterium bovis* BCG strain, *Mycobacterium marinum*, *Mycobacterium smegmatis*, *Mycobacterium tuberculosis*, *Mycobacterium gordonae*, *Mycobacterium microti*.

Lewin, A.; Freytag, B.; Meister, B.; Sharbati Tehrani, S.; Schaefer, H.; Appel, B. **Use of a quantitative TaqMan-PCR for the fast quantification of mycobacteria in broth culture, eukaryotic cell culture and tissue.** *Journal of Veterinary Medicine Series B.* 2003; 50 (10): 505-509. ISSN: 0931-1793

**Descriptors:** *Mycobacterium tuberculosis*, *Mycobacterium bovis* BCG, quantification, in vitro samples, in vivo samples, growth curves, broth cultures, quantitative TaqMan PCR, multiplication within eukaryotic cells, load in tissue before colony counts.

Lungeanu, L.; Neagoe, G.; Huza, I. **The bacterial contamination estimation of the soil by the method of the**

**successive mean samples.** *Proceedings 11<sup>th</sup> International Symposium of the World Association of Veterinary Laboratory Diagnosticians and OIE Semina on Biotechnology, Bangkok, Thailand, 9-13 November, 2003.* 2003; P156. ISBN: 9741325894

**Descriptors:** soil contamination estimate, *Mycobacterium bovis*, bacterial diseases, methodology, microbial contamination, soil pollution, soil types, tuberculosis, Romania.

Moore, Jude A.H.; Roper, Timothy J. **Temperature and humidity in badger *Meles meles* setts.** *Mammal-Review.* 2003 Sep-Dec; 33 (3-4): 308-313. ISSN: 0305-1838

**Descriptors:** 12 badgers (*Meles meles*), *Mycobacterium bovis*, habitat utilization, burrows, setts, temperature and humidity of setts, *Mycobacterium bovis*, survival in setts, seasonal variations, nest chambers, East Sussex, Lewes, England.

Pan American Health Organization. **Intersectoral coordination between health and agriculture: zoonoses, food safety and foot-and-mouth disease. Final Report and Proceedings, XII Inter-American Meeting, Sao Paulo, Brazil, 2-4 May 2001.** 2003: 251. ISBN: 9275124507. Note: Published by the Pan American Health Organization, Pan American Sanitary Bureau, Washing DC, US.

**Descriptors:** human and animal health, impact of zoonotic diseases, brucellosis, bovine tuberculosis, hydatidosis, rabies, bovine spongiform encephalopathy, of and mouth disease, importance of disease control, epidemiology, food safety, food borne diseases, international trade, Latin America.

Zhang, XiYue; Wu, YanGong; Wang, ZhiLiang; Xu, PeiLian; Zhao, YunLing. **Study on ELISA for detecting bovine tuberculosis.** *Chinese Journal of Animal Quarantine.* 2004; 21 (7): 21-22. ISSN: 1005-944x. Note: In Chinese with an English summary.

**Descriptors:** *Mycobacterium bovis*, diagnosis, improved classical ELISA, sodium azide as protective agent, PPD coated plates, cattle serum diluent, TMB as substrate, good specificity.

Zhang, XiYue; Wang, JunWei; Gao, YunHang; He, ZhaoYang. **Study on detection of tuberculosis antibodies in serum of cattle by Dot-IGSS.** *Journal of Jilin Agricultural University.* 2004; 26 (2): 217-219. ISSN: 1000-5684. Note: In Chinese with an English summary.

**Descriptors:** cattle, *Mycobacterium bovis*, detection of serum antibodies, Dot IGSS (Dot-immunogold silver staining, diagnostic technique.

## 2002

Chambers, M.A.; Williams, A.; Hatch, G.; Gavier-Widen, D.; Hall, G.; Huygen, K.; Lowrie, D.; Marsh, P.D.; Hewinson, R.G. **Vaccination of guinea pigs with DNA encoding the mycobacterial antigen MPB83 influences pulmonary pathology but not hematogenous spread following aerogenic infection with *Mycobacterium bovis*.** *Infection and Immunology.* 2002; 70 (4): 2159-2165. ISSN: 0019-9567

**URL:** <http://iai.asm.org/>

**NAL Call Number:** QR1.I57

**Abstract:** Protection of cattle against bovine tuberculosis by vaccination could be an important control strategy in countries where there is persistent *Mycobacterium bovis* infection in wildlife and in developing countries where it is not economical to implement a tuberculin test and slaughter control program. The main aim of such a vaccination strategy would be to reduce transmission of infection by reducing the lung pathology caused by infection and preventing seeding of the organism to organs from which *M. bovis* could be excreted. Recent reports of successful DNA vaccination against *Mycobacterium tuberculosis* in small-animal models have suggested that DNA vaccines act by reducing lung pathology without sensitizing animals to tuberculin testing. We therefore evaluated the ability of vaccines consisting of DNA encoding the mycobacterial antigens MPB83 and 85A to reduce lung pathology and prevent hematogenous spread in guinea pigs challenged with a low dose of aerosolized *M. bovis*. Vaccination with MPB83 DNA reduced the severity of pulmonary lesions, as assessed by histopathology, and resembled *M. bovis* BCG vaccination in this respect. However, unlike BCG vaccination, MPB83 DNA vaccination did not protect challenged guinea pigs from hematogenous spread of organisms to the spleen. In contrast, vaccination with antigen 85A DNA, a promising DNA vaccine for human tuberculosis, had no measurable protective effect against infection with *M. bovis*.

**Descriptors:** recombinant vaccines, vaccine development, mycobacterial antigens MPB83 and 85A.

Fuller, W.A. **Canada and the "buffalo", *Bison bison*: a tale of two herds.** *Canadian Field Naturalist*. January-March, 2002. 116 (1) 141-159. ISSN: 0008-3550

**NAL Call Number:** 410.9 OT8

**Descriptors:** *Bison bison*, plains buffalo, conservation measures, hear relocation, disease control, bacterial diseases, bovine tuberculosis and brucellosis, *Mycobacterium*, *Brucella abortus*, Wood Buffalo National Park, relocation, herd management and culling, historical review, Alberta, Canada.

Poloz, A.I. **Environmental contamination with *Mycobacterium* species.** *Veterinarnaya Nauka Proizvodstvu*. 2002; (36): 137-140. Note: In Russian.

**Descriptors:** *Mycobacterium bovis*, *Mycobacterium fortuitum*, animal housing, environmental contamination, Russia.

Surujballi, O.P.; Romanowska, A.; Sugden, E.A.; Turcotte, C.; Jolley, M.E. **A fluorescence polarization assay for the detection of antibodies to *Mycobacterium bovis* in cattle sera.** *Veterinary Microbiology*. 2002; 87 (2): 149-157.

ISSN: 0378-1135

**URL:**[http://www.elsevier.com/wps/find/journaldescription.cws\\_home/503320/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/503320/description#description)

**NAL Call Number:** SF601.V44

**Abstract:** A fluorescence polarization assay (FPA) utilizing fluorescein-labelled MPB70 protein as the antigen was developed and evaluated for its ability to detect antibodies to *Mycobacterium bovis* in cattle sera. Three panels of sera were examined in this study. These included: (A) sera (n = 28) obtained from cattle from which *M. bovis* was cultured; (B) sera (n = 5666) from Canadian field cattle which were presumed to be free from *M. bovis*; (C) sera (n = 10) from cattle infected with *Mycobacterium paratuberculosis* and known to contain antibodies to this organism. Receiver operating characteristic (ROC) curve analysis of the results of panels A and B yielded an area under the curve value of 0.975 (95% confidence interval = 0.971-0.979), which indicated that this FPA is an accurate indicator of *M. bovis* infection. At the cut-off point recommended by the ROC curve analysis, the FPA sensitivity and specificity estimates were 92.9% (95% confidence interval = 76.5-98.9%) and 98.3% (95% confidence interval = 97.9-98.6%) respectively. The FPA results were compared to the results of the single intradermal (SID) test for the 28 infected cattle. Fifteen of these animals were scored positive with the SID test (sensitivity = 53.6%). The FPA detected 15/15 (100%) of the SID test-positive animals and 11/13 (84.6%) of the SID test-negative animals. Two of the culture-positive cattle were not detected by either test. None of the sera that were obtained from the *M. paratuberculosis*-infected animals cross-reacted in this assay.

**Descriptors:** cattle, *Mycobacterium bovis*, fluorescence, detection, antibodies, diagnostic techniques, serodiagnosis, *Mycobacterium avium* ssp. *paratuberculosis*, cross reaction.

Varela, E.; Masso, F.; Paez, A.; Zenteno, R.; Zenteno, E.; Montano, L.F. **Isolation of a 19-kDa *Mycobacterium bovis*-specific antigen, different from MPB70/80, by chromatofocusing.** *Preparative Biochemistry & Biotechnology*. 2002; 32 (4): 329-340. ISSN: 1082-6068

**NAL Call Number:** QD415.A1P7

**Descriptors:** diagnostic techniques, *mycobacterium bovis*, specific antigen, chromatofocusing technique.

Vysotskii, A.E. **[Application of KDP preparation in disinfection of cattle housing in herds with endemic tuberculosis.]** *Veterinarnaya Nauka Proizvodstvu*. 2002; (36): 25-33. Note: In Russian.

**Descriptors:** cattle, *Mycobacterium bovis*, animal housing, contamination, disinfection.

## 2001

Bonenberger, T.E.; Ihrke, P.J.; Naydan, D.K.; Affolter, V.K. **Rapid identification of tissue micro-organisms in skin biopsy specimens from domestic animals using polyclonal BCG antibody.** *Veterinary Dermatology*. 2001; 12 (1): 41-47. ISSN: 0959-4493

**NAL Call Number:** SF901.V47

**Descriptors:** dogs, cats, horses, cattle, llamas, skin, biopsy, microorganisms, antibodies, *Mycobacterium bovis* BCG strain, staining, diagnostic techniques, rapid methods, screening, immunostaining.

## 2000

Castro-Ramos, M.; Errico, F.; Trelles, A.; Curbelo, R.; Laborde, M. **Mycobacterias aisladas de fuentes hidricas en la cuenca lechera de Uruguay.** [Mycobacteria associated with water sources in the milk basin of Uruguay.] *Veterinaria Montevideo*. 1999/2000; 35(141): 21-23. ISSN: 0376-4362. Note: In Spanish with an English summary.

**Descriptors:** dairy cattle, dairy farming, *Mycobacterium* species, *Mycobacterium bovis*, *Mycobacterium terrae*, *Mycobacterium gastri*, *Mycobacterium triviale*, *Mycobacterium vaccae*, microbial contamination of water, monitoring of drainage water and drinking water, disease prevalence, disease surveys, epidemiological surveys, epidemiology, Uruguay

Hird, D.W.; Arzt, J.; Morfin, S.A.; Hayes, R.H.; Magliano, D.J.; Conrad, P.A. **Problem-oriented instruction in epidemiology using web-based teaching modules in international veterinary medicine.** *Proceedings of the 9<sup>th</sup> Symposium of the International Society for Veterinary Epidemiology and Economics, Breckenridge, Colorado, USA, August 6-11, 2000.* 2000: Id 665.

**Descriptors:** cattle, horses, *Mycobacterium bovis*, classroom materials, educational methods, instruction, instructional materials, neuropathy, teaching aids, teaching equipment, Chile, Mexico, South Africa.

## 1999

Bulling, E.; Schonberg, A. **Robert von Ostertag (1864-1940). A veterinarian contemporary with R. Virchow and R. Koch.** *Historia Medicinae Veterinariae*. 1999. 24 (4) 97-120. Note: In English with a German summary.

**NAL Call Number:** SF615 A1V4

**Descriptors:** veterinary history, biographical information, slaughter houses, abattoirs, meat hygiene, infectious diseases, meat inspection, meat products, pathology, slaughter, bovine tuberculosis and other zoonotic diseases, veterinary contributions.

Fischer, O. **Vyznam dvoukridleho hmyzu (Diptera) pro prenos, sireni a prezivani puvodcu nekterych bacterialnich a plisnovych onemocneni lidi a zvirat.** [The importance of *Diptera* for transmission, spreading and survival of agents of some bacterial and fungal diseases in humans and animals.] *Veterinarni Medicina*. 1999. 44 (5) 133-160. Note: In Czech with an English summary.

**NAL Call Number:** 41.9 C333

**Descriptors:** zoonotic disease transmission, insect vectors, flies, *Diptera*, various diseases, brucellosis, cholera, conjunctivitis, tuberculosis, *Mycobacterium*, leprosy, leptospirosis, bovine mastitis, pasteurellosis, salmonellosis, anthrax, tularaemia, transovarial transmission.

Manaia, J.; Budge, G. **Accreditation for TB testing - the requirements and the process.** *Publication - Veterinary Continuing Education, Massey University*. 1999. No. 189, 173-175. 29th Seminar of the Society of Sheep and Beef Cattle Veterinarians NZVA, Hastings, New Zealand, 1-3 March 1999.

**NAL Call Number:** SF604 P82

**Descriptors:** cattle tuberculosis, disease control, diagnosis, diagnostic techniques, New Zealand.

Sakate, R.I.; Santos, F.L.; Cardoso, R.C.V.; Brandao, S.C.C. **Elaboracao e planejamento do sistema HACCP para estabulo leiteiro.** [Development and planning of a HACCP system for a dairy factory.] *Higiene Alimentar*. 1999. 13 (65) 30-36. Note: In Portuguese with an English summary.

**Descriptors:** HACCP system, Brazil, type C dairy farms, quality control, dairy products and processes, animal diseases, milk cooling, cows, animal health, listeriosis, pathogens, pesticide residues, antibiotic residues laws and regulation, storage, toxins, tuberculosis, vaccination programs, salmonellosis, leptospirosis, FMD, brucellosis, coliform bacteria, anti-helminthics.

## 1998

Calceró-Ordóñez, V.; Ordóñez, V.C. **Se puede y debe conocer mejor el sector lechero.** [You can and should know more about the dairy industry.] *Agricultura, Revista Agropecuaria*. 1998. 67 (789) 301. Note: In Spanish.

**NAL Call Number:** 15 Ag84

**Descriptors:** dairy industry, milk contamination levels, dairy farms, information, availability, statistics, economics, lack of availability of governmental reports, Spain.

Cornejo, B.J.; Sahagun-Ruiz, A.; Suarez-Guemes, F.; Thornton, C.G.; Ficht, T.A.; Adams, L.G. **Comparison of C18-carboxypropylbetaine and glass bead DNA extraction methods for the detection of *Mycobacterium bovis* in bovine milk samples and analysis of samples by PCR.** *Applied and Environmental Microbiology*. Aug. 1998. 64 (8) 3099-3101. ISSN: 0099-2240

**NAL Call Number:** 448.3 Ap5

**Abstract:** The purpose of this prospective study was to compare two different milk preparation methods to assay for the presence of *Mycobacterium bovis* by PCR. Detection by a C18-carboxypropylbetaine (CB-18)-based sample processing method was compared to extraction of DNA from milk with glass beads. Samples from 17 skin test-positive cattle were analyzed. Following CB-18 processing and glass bead extraction, the sensitivity of IS6110-based PCR was 94.1 and 58.8%, respectively ( $P < 0.025$ ). Because CB-18 processing will permit the proficient use of PCR for diagnosis and surveillance of bovine tuberculosis, it will contribute to the more efficient detection and control of tuberculosis.

**Descriptors:** polymerase chain reaction, detection methods, milk, *Mycobacterium bovis*, surveillance.

Dai, G.; McMurray, D.N. **Altered cytokine production and impaired antimycobacterial immunity in protein-malnourished guinea pigs.** *Infection and Immunity*. Aug. 1998. 66 (8) 3562-3568. ISSN: 0019-9567

**NAL Call Number:** QR1.I57

**Descriptors:** malnutrition effects, guinea pigs, tuberculosis, cytokines, immune responses, *Mycobacterium*.

Mainali, E.S.; McMurray, D.N. **Adoptive transfer of resistance to pulmonary tuberculosis in guinea pigs is altered by protein deficiency.** *Nutrition Research*. Feb. 1998. 18 (2) 309-317. ISSN: 0271-5317. Note: In the special festschrift issue: to honor the academic achievements of Dr. Ranjit Kumar Chandra on his 60th birthday, February 2, 1998 / edited by S. Denduluri, E. O'Brien, Y. Bryne and G. Ramchandani.

**NAL Call Number:** QP141.A1N88

**Abstract:** Adoptive transfer of lymphoid cells was used to study the influence of dietary protein deficiency on the development and expression of resistance in inbred strain 2 guinea pigs infected by the respiratory route with virulent *Mycobacterium tuberculosis* H37Rv. Cells from the bronchotracheal lymph nodes of aerosol-infected donors and from the spleens of intravenously-infected donors transferred a significant level of protection when injected ( $0.5-1.0 \times 10^8$  cells) into syngeneic recipients by the intraperitoneal route. Nylon wool enrichment of T cells from both cell populations resulted in a marked increase in the level of resistance transferred. Adoptively-protected guinea pigs were as resistant, as measured by control of viable *M. tuberculosis* in the lungs, as animals actively vaccinated with *M. bovis* BCG. Donor lymphocytes were more effective when transferred into the recipients by the intraperitoneal, as compared to the subcutaneous, route of injection. Reciprocal adoptive transfer between well-nourished or protein-deficient donors and recipients revealed that protein deficiency prevented guinea pigs from generating a population of immune lymphocytes as indicated by the relative inability of such cells to protect normally-nourished recipients. However, protein-deprived recipients were perfectly capable of being protected by immune cells from well-nourished donors. Adoptively protected protein-deficient guinea pigs developed large, well-circumscribed tuberculous granulomas in their lungs, in contrast to their non-protected counterparts which developed numerous, small, poorly-defined granulomata. Our data suggest that the cellular and humoral environment of the protein-deficient guinea pig is not intrinsically suppressive, but that protein deficiency prevents infected animals from generating a population of protective lymphocytes.

**Descriptors:** tuberculosis, protein deficiencies, disease resistance, adoptive immunity, *Mycobacterium tuberculosis*, experimental infections, lymph nodes, lungs, intraperitoneal injection, subcutaneous injection, intravenous injection, aerosols, donors, enrichment, T lymphocytes, nutritional state, immune response, inbred strains, guinea pigs, animal models.

Ruffo, G.C.; Lopez, M.C.; Pezza, F. **Piani di risanamento degli allevamenti: sanzioni da applicare. [Sanctions of Italian legislation in treating infectious diseases.]** *Atti della Societa Italiana di Buiatria*. 1998. 30: 233-237. Note: Congresso Nazionale, Piacenza, Italy, May 1998. In Italian with an English summary.

**Descriptors:** infectious diseases, cattle, goats, sheep, legislation, tuberculosis, brucellosis, leucosis, disease control measures, *Mycobacterium*.

Warriner, K. **North Australian farming - the corporate farm and its future.** *Agriculture in the Commonwealth: sustainable use of land and water. Eighteenth biennial conference, Darwin, Australia, 1998*. Kensington Publications

Ltd; London; UK. 1998. p. 35-38.

**Descriptors:** corporate farming systems, disease eradication, brucellosis, tuberculosis, *Mycobacterium*, export trade, agricultural development, agricultural production, vertical integration, structural change, trends, forecasts, exports, investment, Australia.

## 1997

Chan, J.; Tanaka, K.; Mannion, C.; Carroll, D.; Tsang, M.; Xing, Y.; Lowenstein, C.; Bloom, B.R. **Effects of protein calorie malnutrition on mice infected with BCG.** *Journal of Nutritional Immunology*. 1997. 5 (1) 11-19. ISSN: 1049-5150. Note: In the special issue: Nutritional abnormalities in infectious diseases: effects on tuberculosis and AIDS / edited by C.E. Taylor.

**NAL Call Number:** QP141.A1J685

**Descriptors:** protein energy malnutrition, *Mycobacterium bovis* BCG strain, BCG vaccine, infections, susceptibility, macrophages, nitrogen oxides, defense mechanisms, *Mycobacterium tuberculosis*, granuloma, immune response, mice, animal models.

Reuter, G. **Veterinarmedizin und Gesundheitsvorsorge. [Veterinary medicine as part of preventive medicine.]** *Berliner und Munchener Tierarztliche Wochenschrift*. 1997. 110 (11/12) 431-435. Note: In German with an English summary.

**NAL Call Number:** 41.8 B45

**Descriptors:** meat producing animals, food safety, role of veterinary medicine, preventive medicine, public health risks, foodborne diseases, tuberculosis, disease control and prevention, BSE, bovine spongiform encephalopathy, drug residues, *Mycobacterium*, veterinary history.

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## USDA FUNDED PROJECTS FROM THE CRIS DATABASE

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**ACCESSION NO:** 0203516 **SUBFILE:** CRIS

**PROJ NO:** COLV-2005-06103 **AGENCY:** CSREES COLV

**PROJ TYPE:** SPECIAL GRANT **PROJ STATUS:** EXTENDED

**CONTRACT/GRANT/AGREEMENT NO:** 2005-34405-15758 **PROPOSAL NO:** 2006-06123

**START:** 15 AUG 2005 **TERM:** 14 MAY 2008 **FY:** 2006 **GRANT YR:** 2006

**GRANT AMT:** \$755,088

**Investigator:** Salman, M. D.

**Performing Institution:**

Clinical Science

Colorado State University

Fort Collins, Colorado 80523

### **ENHANCEMENT OF THE PROGRAM FOR ECONOMICALLY IMPORTANT INFECTIOUS ANIMAL DISEASES**

**NON-TECHNICAL SUMMARY:** A multidisciplinary research center is needed to study animal diseases of economic importance. Integration of studies covering a broad spectrum of disciplines is needed to prevent duplication of existing efforts and programs. A comprehensive study approach is expected to lead to improved disease surveillance, risk assessment, management, and control/prevention strategies. Furthermore, these studies will lead to the generation of fundamental knowledge concerning disease transmission, diagnosis, pathogenesis, and virulence of economically important infectious animal diseases.

**OBJECTIVES:** The objectives are to: 1) Initiate, conduct, and promote research activities on infectious animal diseases that have impacts on trade issues. Following the mission of a land grant university, research in both a basic and applied arena are initiated and conducted with the focus on diseases that have local, regional, or national trade impacts. 2) Use a multidisciplinary, integrated approach to examine each disease studied. Experts from different disciplines, other institutions, governmental agencies, and local and regional laboratories collaborate under the aegis of PEIAD in order to solve complex problems, thereby minimizing redundancy and promoting the expertise of individuals. By integrating information gathered through these collaborations, the effectiveness of each research project is maximized. 3) Prioritize research topics through the PEIAD Advisory Group. Representatives from the livestock industry, animal health (including governmental) decision-makers, and researchers from other institutions are enlisted to prioritize critical research. In this way, issues of practical and timely importance, rather than issues of purely academic interest, are being addressed. 4) Disseminate results and information. Research results are available directly to the stakeholders for immediate implementation through the PEIAD Advisory Group. Information and links related to PEIAD research are also being made available on the APhi website ([www.cvmb.colostate.edu/aphi](http://www.cvmb.colostate.edu/aphi)). 5) Provide training and graduate programs, including international study programs with a focus on important animal diseases. Industry, international, veterinary, and traditional students from many disciplines receive advanced, short-term or long-term training in a variety of areas through the APhi position within Colorado State University.

**APPROACH:** PEIAD will include three major sections which will be simultaneously integrated into the research approach: biology of infectious diseases, epidemiology of animal diseases, and risk analysis/assessment. An Advisory group will be composed of scientists from all involved disciplines, commodity representatives, state departments of agriculture, and consumer advocates.

**PROGRESS:** 2005/08 TO 2006/08

The focus of PEIAD is the advancement of research and outreach activities that are related to economically critical infectious animal diseases in order to prevent the introduction and spread of infectious diseases in US animal populations. Research strategies unite appropriate diagnostic measurements and surveillance systems through an

integrated, broad-based approach. Research

findings are synthesized so that an animal disease concern is pursued from its roots in basic science through to policy development. The five priority PEIAD research areas are: I. Global, emerging infectious animal diseases include 1) Extensive involvement in the current global effort to control the spread of Avian Influenza in poultry through conducting national and international training programs, participating in risk modeling, and advising government agencies regarding control strategies. 2) Research on FMD in wildlife species to address transmission from wildlife to domestic species. 3) Participation in the global and national science-based policy making process for BSE and other TSE diseases in animal populations 4) Participation in global animal health and welfare through engagement with the European Union Animal Health Programs. II. Risk and decision analysis models include creation of a risk analysis model for describing the spread of highly contagious animal diseases. This model is currently being evaluated by Canadian and US animal health authorities for its application in FMD and AI situations. Validation of the model is underway using data collected from the most recent outbreaks of FMD in Uruguay and Exotic New Castle disease in California. III. Endemic animal diseases that impact animal movement, marketing and food safety studies include the development of a bovine tuberculosis (*Mycobacterium bovis*) assay that is currently used by USDA National Veterinary Services Laboratory and participation in the validation of the new, advanced diagnostic assays for animal diseases such as Vesicular Stomatitis (VSV) and FMD. IV. Biosecurity includes development of a nationally and internationally recognized program for objective assessment of the efficacy and value of biosecurity practices and initiation and continuation of an awareness program in foreign animal diseases for practicing veterinary professionals to train them to be first responders in the event of a disease introduction. V. Antimicrobial drug use and antimicrobial resistance includes development and publication of major "white paper" concerning use of antimicrobial drugs by veterinarians for treatment of disease and the development of both large-scale assessments of antimicrobial drug use patterns for treatment of animal diseases and large-scale investigations concerning association of antimicrobial drug use and antimicrobial resistance in livestock species (especially beef and dairy cattle).

#### **IMPACT: 2005/08 TO 2006/08**

Establish a biosecurity model for the intentional or non-intentional introduction of exotic diseases such as AI to livestock premises & other facilities. Continue the training programs at local, national, & international levels in disease. Investigations, surveillance systems and control strategies for highly contiguous animal diseases. Contribute to the assessment of global surveillance for infectious animal diseases including AI, FMD, bovine TB, and BSE. Validate real time PCR for detection of vesicular stomatitis virus in cattle. Address the critical need for a sensitive & specific rapid screening test for *Mycobacterium bovis* by continuing serological & molecular studies. Implement the recommendations for establishing an FMD free zone region between Thailand, Myanmar & Malaysia in conjunction with the OIE regional office. This activity is a model of a risk assessment process to establish a disease free zone. Continue assessment of potential FMD disease transmission between domestic animals & wildlife. Continue Johnes Disease research to determine the association between infection status of dairy cows based on postmortem histopathology & culture of multiple tissues and previous results of fecal culture and multiple sera ELISA tests. Complete efforts documenting patterns of antimicrobial drug use in animals by veterinarians in the U.S. Continue research investigating associations among antimicrobial drug use, antimicrobial resistance and effects on animal health & production. Provide an outreach program in foreign animal diseases for practicing veterinary professionals.

#### **PUBLICATIONS (not previously reported): 2005/08 TO 2006/08**

1. Branscum AJ, Gardner IA, Wagner BA, McIntuff PS, Salman, MD. Effect of diagnostic testing error on intraclass correlation coefficient estimation. *Prev Vet Med* 2005 69:63to75.
2. Davidson AH, Traub-Dargatz JL, Rodeheaver RM, Ostlund EM, Pedersen DD, Moorhead RG, Stricklin JB, Young BD, Dewell RD, Salman MD, et al. Immunologic responses to West Nile virus in vaccinated and clinically affected horses. *J Am Vet Med Assoc* 2005 226:240to5.
3. Dewell GA, Ransom JR, Dewell RD, McCurdy K, Gardner IA, Hill AE, Sofos JN, Belk KE, Smith GC, Salman MD. Prevalence of and Risk Factors for *Escherichia coli* O157 in Market-Ready Beef Cattle from 12 U.S. Feedlots. *Foodborne Pathogens and Disease* 2005 2:70to76.
4. Dunowska M, Morley PS, Hyatt DR. The effect of Virkon S fogging on survival of *Salmonella enterica* and *Staphylococcus aureus* on surfaces in a veterinary teaching hospital. *Vet Micro* 2005; 105: 281 to 289.
5. Morley PS, Morris N, Hyatt DR, Van Metre DC. Evaluation of the efficacy of disinfectant footbaths as used in veterinary hospitals. *J Am Vet Med Assoc* 2005; 226:2053 to 2058.

6. Patterson G, Morley PS, Blehm KD, Lee DE, Dunowska M. Efficacy of directed misting application of a peroxygen disinfectant for environmental decontamination of a veterinary hospital. J Am Vet Med Assoc 2005; 227:597 to 602.
7. Zepeda C, Salman M, Thiermann A, Kellar J, Rojas H, Willeberg P. The role of veterinary epidemiology and veterinary services in complying with the World Trade Organization SPS agreement. Prev Vet Med 2005 67:125 to 140.
8. Cleveland SM, Salman MD, Van Campen H. Assessment of a bovine viral diarrhea virus (BVDV) antigen capture ELISA and a micro-titer virus isolation ELISA using pooled ear notch and serum samples. J Vet Diagn Invest. 2006 July; 18(4): 395to8.
9. Cleveland SM, Zagmutt-Vergara FJ, Cleveland MA, Salman MD, Van Campen H. 2006 A stochastic simulation model of control of bovine viral diarrhoea virus (BVDV) in western US beef herds based on identification and removal of persistently infected (PI) animals. Accepted in the Journal of Preventive Veterinary Medicine.
10. Herrero M. V., Peral J., Vazquez J., Navarro R., Salman MD, Rodriguez L.L. A Retrospective Study Of Vesicular Stomatitis In Mexico (1981 to 2000) Utilizing Geographic Information System (Gis). Accepted in the Journal of Preventive Veterinary Medicine.
11. Pedersen K, Clark L, Andelt WF, Salman MD. Prevalence of *Shiga* Toxin-producing *Escherichia coli* and *Salmonella enterica* in Pigeons Captured in Fort Collins, Colorado. J Wildl Ds. 2006 Jan; 426(1):46to55.
12. Stockton KA, Morley PS, Hyatt DR, Burgess BA, Patterson G, Dunowska M, Lee DE. Effects of footwear hygiene protocols on bacterial contamination of floor surfaces in an equine hospital. J Am Vet Med Assoc 2006 Apr; 228 (7): 1068to73.
13. Tanner JM, Traub-Dargatz JL, Hill AE, Van Campen H, Knight AP, Cunningham WE, Salman MD. 2006 Population Characteristics of Equids Tested for West Nile Virus Infection in Colorado in 2003. Accepted in the Journal of American Veterinary Medical Association.
14. Antognoli MC, Salman MD, Hill AE, Jemmi T, Ochs H. Comparison of Test Strategies for Control of Paratuberculosis in Switzerland. 2006
15. Immunologic responses and protection in elk vaccinated with *Brucella abortus* strain RB51over-expressing SOD and wboA. P. Nol, S.C. Olsen, W.S. Stoffregen, J.C. Rhyen, S.M. Boyle, G.G. Schurig. Clin Vaccine Immunol 2006 Oct; 13 (10):1098to1103.
16. Seminar-Efficacy of Oral and Parenteral bacille Calmette-Guerin (BCG) in Protecting White-tailed Deer Against Bovine Tuberculosis. USDA National Wildlife Research Center, Fort Collins, CO May 25, 2006
17. Oral Presentation Efficacy of Oral and Parenteral bacille Calmette-Guerin (BCG) in Protecting White-tailed Deer Against Bovine Tuberculosis. Wildlife Disease Association Annual Conference, Storrs, CT August 8, 2006
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22. Dunowska M, Morley PS Traub-Dargatz JL, Davis MA, Patterson G, Frye JG, Hyatt DR, Dargatz DA. Comparison of *Salmonella enterica* serotype *Infantis* isolates from a veterinary teaching hospital. J Appl Microbiol 2007Jun; 102(6): 1527to36..
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33. Effect of transportation and lairage on *E. coli* O157 and *Salmonella enterica* in finished U.S. beef cattle. Dewell GA, Dewell RD, Simpson CA, Patterson JG, Hyatt DR, Scanga JA, Morley PS, Belk KE, Grandin T, Smith GC, Salman MD. Proceedings of the 11th Symposium of the International Society for Veterinary Epidemiology and Economics, Cairns, Australia, 2006. Number 1109.
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35. Morley PS. Practical biosecurity considerations for beef operations. Proceedings of the 24th Annual American College of Veterinary Internal Medicine Forum, Louisville, KY, 2006. p 245.
36. Booker CW, Morley PS, Janzen ED, Guichon PT, Jim GK, Schunict OC, Wildman BK, Pittman TJ, T Perrett. Re-examination of fatal undifferentiated fever/bovine respiratory disease of feedlot cattle. Proceedings of the 7th Annual Phi Zeta Research Day, CSU College of Veterinary Medicine and Biomedical Science, Fort Collins, CO, 2006. p 71.
37. Analysis of mortality clustering: a new approach for investigating prevention methods. Invited presentation at the 20th annual Feedlot Health Management Services Research Seminar, Calgary, Canada, 2006.
38. Coping with Salmonella in Equine Patients, Populations, and Facilities. Invited presentation for the Equine Emerging Issues Luncheon at the 24th annual American College of Veterinary Internal Medicine Forum, Louisville, KY, 2006.
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veterinary hospitals. J Am Vet Med Assoc 2005; 226:2053to2058.

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46. Herrero M. V., Peral J., Vazquez J., Navarro R., Salman MD, Rodriguez L.L. A Retrospective Study Of Vesicular Stomatitis In Mexico (1981 to 2000) Utilizing Geographic Information System (GIS). Accepted in the Journal of Preventive Veterinary Medicine.
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**PROJECT CONTACT:**

Name: SALMAN, M. D.

Phone: 970-491-7950

Fax: 970-291-1889

Email: m.d.salman@colostate.edu

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**ACCESSION NO:** 0196720 **SUBFILE:** CRIS

**PROJ NO:** COLV-SALMAN **AGENCY:** CSREES COLV

**PROJ TYPE:** SPECIAL GRANT **PROJ STATUS:** TERMINATED

**CONTRACT/GRANT/AGREEMENT NO:** 2003-34405-13795 **PROPOSAL NO:** 2003-06088

**START:** 15 AUG 2003 **TERM:** 14 AUG 2004 **FY:** 2004 **GRANT YR:** 2003

**GRANT AMT:** \$696,539

**Investigator:** Salman, M.

**Performing Institution:**

Environmental Health Research

Colorado State University

Fort Collins, Colorado 80523

**ENHANCEMENT OF THE PROGRAM FOR ECONOMICALLY IMPORTANT INFECTIOUS ANIMAL DISEASES**

**NON-TECHNICAL SUMMARY:** A multidisciplinary research center is needed to study animal diseases of economic importance. Integration of studies covering broad spectrum of disciplines is needed to prevent duplication of existing efforts and programs. A comprehensive study approach is expected to lead to improved disease surveillance, risk assessment, management, and control/prevention strategies. Furthermore, these studies will lead to the generation of fundamental knowledge concerning disease transmission, diagnosis, pathogenesis, and virulence of economically important animal diseases.

**OBJECTIVES:** A multidisciplinary research center at CSU will be established to study animal diseases of economic importance. The Center will work collaboratively with universities, and state and federal agencies in order to produce results covering a broad spectrum of disciplines without duplication of existing efforts and programs. Expected results are: 1)The development of improved surveillance, risk assessment, management, and control/prevention strategies;

2) Generation of fundamental knowledge concerning transmission, diagnosis, pathogenesis, and virulence of economically important infectious animal diseases.

**APPROACH:** The Center will include three major sections which will be simultaneously integrated into the research approach: biology of infectious diseases, epidemiology of animal diseases, and risk analysis/assessment. An advisory group will be composed of scientists from all involved disciplines, commodity representatives, state departments of agriculture, and consumer advocates.

**PROGRESS:** 2003/08 TO 2004/08

TSEs 6 commercial screening assays were evaluated for deer/elk. A project was initiated which could result in diagnostic tests and prevention methods for prionic infections. Personnel were trained on the western blot test for the presence of CNS tissue in food products. PEIAD hosted a conference TSE in Animal Populations: Facts & Fiction to address research and policy issues. Participation in international organizations in risk assessment and classification of countries for BSE status: Dr. Salman was re-appointed to the scientific working group of the GBR. West Nile Virus (WNV) Epidemiology: A survey with the goal of determining the long-term outcome of WNV-affected horses was initiated. A study has been initiated to compare antibody titers of WNV in vaccinated horses to those recovering from natural infection. APHI personnel also investigated the possibility of development of an ELISA test for detection of IgG to WNV. Vesicular Stomatitis (VS) Participation in the field validation of the newly developed real-time PCR for VSV detection Test development: A one-step single tube multiplex reverse-transcriptase PCR test for detection of the VSV in biological samples and insects was developed and validated. Molecular epidemiology: Molecular fingerprinting is being used in conjunction with GIS analysis to understand the spread of the VSV. Serological data: The team has demonstrated serological evidence of VSV during non-outbreak years. Equine Infectious Diseases Equine clostridiosis Toxoid development: Development of a toxoid against equine clostridiosis for use in broodmares prior to foaling has been investigated. Test development and validation: A test to identify clostridial beta 1 and beta 2 toxins in clinical samples was developed and is now being validated. Treatment: The use of metranidazole and the subsequent development of resistance were investigated. Mycobacterial work *M bovis* and *M tuberculosis* Serological testing PCR development and testing Non-domestic species Molecular epidemiology *M avium* ssp *paratuberculosis* (Johnes disease) Diagnostic strategies PCR development and testing Assessment of the presence of *M avium* ssp *parath* in selected lymph nodes & other tissues Food Safety and Risk Analysis *E. coli* O157 testing Fecal sampling protocols Analytical methods Modeling prevalence in clusters Modeling low prevalence Modeling test dependence Modeling transmission Global Vet Epidemiology Researchers have continued to collaborate with several animal health researchers and regulators in the design & implementation of projects related to surveillance and risk analysis. Other Topics Researchers have secured funding to gather corresponding antimicrobial resistance data from intensive livestock raising units in South America to compare to data from the USA New RB51 brucellosis vaccine are being developed and tested for use in bison and wild ungulates. A nationally-recognized biosecurity program for livestock operations, including teaching hospitals, was developed and initiated. PEIAD personnel provide teaching expertise for the delivery of epidemiology training to USDA VMOs. A new initiative involves the creation of on-line course.

**IMPACT:** 2003/08 TO 2004/08

The PEIAD will continue to support detection and prevention of animal diseases that have impact on movement and trade of animals and animal products.

**PUBLICATIONS (not previously reported):** 2003/08 TO 2004/08

1. Paul S. Morley, Josie L. Traub-Dargatz, et. al. Availability of Antimicrobial Drugs for Use in Animals Without a Prescription. College of Veterinary Medicine and Biomedical Sciences, Colorado State University: Fort Collins, Colorado. Poster presentation, Phi Zeta, Research Day, 2004.
2. Young S, Dunowska M, Hyatt DR, Morley PS. Evaluation of the environmental cleanliness in a veterinary teaching hospital. Poster presented at the Workshop on Nosocomial Infections and Biosecurity for Equine Hospitals. Dorothy Russell Havemeyer Foundation, Lexington, KY, 2003
3. Serena Young, Magda Dunowska, Doreene R. Hyatt, Paul S. Morley. Evaluation of the Environmental Cleanliness in a Veterinary Teaching Hospital. College of Veterinary Medicine and Biomedical Sciences, Colorado State University: Fort Collins, Colorado. Poster presentation, Phi Zeta Research Day, 2004.
4. Antimicrobial use and resistance in enteric bacteria. Invited presentation presented at the 2003 FDA/CSFSAN-CVM Research Meeting. Baltimore, MD, 2003.

5. Morley PS, Hyatt DR, Dunowska M. The Effect of Virkon Fogging on Survival of *Salmonella enterica* on Surfaces in a Veterinary Teaching Hospital. Presentation at the CSU, Phi Zeta research day, January 2004.
6. Evaluation of the Efficacy of Disinfectant Footbaths. Nanea Morris, Paul S. Morley, Doreene R. Hyatt. College of Veterinary Medicine and Biomedical Sciences, Colorado State University: Fort Collins, Colorado. Poster Presentation, Phi Zeta Research Day, 2003.
7. Antognoli, M.C., Hirst H.L, Goodell G., and Salman M.D. Evaluation of Cell Mediated Immunity-based tests for detection of Paratuberculosis in young cattle. Tenth International Symposium of Veterinary Epidemiology and Economics. Abstract 325. Vina del Mar, Chile, November 17-21, 2003
8. Antognoli, M.C., Hirst H.L, Goodell G, and Salman M.D. Evaluation of three methods for direct diagnosis of Paratuberculosis in dairy cattle. Tenth International Symposium of Veterinary Epidemiology and Economics. Abstract # 326. Vina del Mar, Chile, November 17-21, 2003
9. Morley PS. Infectious Disease Monitoring and Surveillance at the James L. Voss Veterinary Teaching Hospital. Invited presentation at the Workshop on Nosocomial Infections and Biosecurity for Equine Hospitals. Dorothy Russell Havemeyer Foundation, Lexington, KY, 2003.
10. Dunowska M, Morley PS. Surveillance for *Salmonella* shedding in large animal patients. Poster presented at the Workshop on Nosocomial Infections and Biosecurity for Equine Hospitals. Dorothy Russell Havemeyer Foundation, Lexington, KY, 2003.
11. Surveillance for *Salmonella* Shedding in Large Animal Patients. Magda Dunowska and Paul S. Morley, College of Veterinary Medicine and Biomedical Sciences, Colorado State University: Fort Collins, Colorado. Poster presentation, Phi Zeta Research Day, 2003.
12. Burgess BA, Morley PS, Hyatt DR. 2004 Environmental Surveillance for *Salmonella* in a Veterinary Teaching Hospital. J Am Vet Med Assoc [Submitted].
13. Burgess BA, Morley PS, Hyatt DR. Environmental surveillance for *Salmonella* in a veterinary teaching hospital. Poster presented at the Workshop on Nosocomial Infections and Biosecurity for Equine Hospitals. Dorothy Russell Havemeyer Foundation, Lexington, KY, 2003.
14. Burgess BA, Morley PS, Hyatt DR. Salmonella surveillance in a large veterinary teaching hospital. Poster presented at the 4th Annual Phi Zeta Research Day, CSU College of Veterinary Medicine and Biomedical Science, Fort Collins, CO, 2003.
15. Salazar P, Traub-Dargatz JL, Morley PS, et al. Characterization of the 2002 West Nile Virus Epidemic in Nebraska and Colorado equids. J Am Vet Med Assoc [In Press].
16. Geiser S, Seitzinger A, Salazar P, et al. Economic Impact of West Nile Virus on the Colorado and Nebraska Equine Industries: 2002. [Government Report]. USDA:APHIS:VS, Centers for Epidemiology and Animal Health. Fort Collins, CO, 2003. [available <http://www.aphis.usda.gov/vs/ceah/cahm/Equine/wnv-info-sheet.pdf>] #N394.0403. 4 pp.
17. Traub-Dargatz JL, Salazar P, Morley PS, et al. Vaccination status and outcome of cases of equine west Nile virus cases in Colorado and Nebraska in 2002. Proceedings of the 3rd International Veterinary Vaccines and Diagnostics Conference, Guelph, Ontario, 2003, p 68.
18. Salazar P, Traub-Dargatz JL, Morley PS, et al. Characterization of the 2002 West Nile Virus Epidemic in Nebraska and Colorado equids. Scientific Proceedings of the 4th Annual Phi Zeta Research Day of the Theta Chapter, CSU College of Veterinary Medicine and Biomedical Science, Fort Collins, CO, 2003, p 34.
19. Traub-Dargatz JL, Morley PS, Salazar P, et al. Characterization of the 2002 West Nile Virus Epidemic in Nebraska and Colorado equids. Presented at the 10th International Society for Veterinary Epidemiology and Economics Symposium, Vina del Mar, Chile, 2003.
20. Geiser S, Seitzinger A, Salazar P, Traub-Dargatz J, Morley P, Salman M, Wilmot D, Steffen D, Cunningham W. Economic Impact of West Nile Virus on the Colorado and Nebraska Equine Industries: 2002. Presented at the 10th International Society for Veterinary Epidemiology and Economics Symposium, Vina del Mar, Chile, 2003.
21. International Society for Veterinary Epidemiology and Economics Abstract and Oral Presentation by Dr. Elizabeth Mumford, November 2003 and Abstract and Oral Presentation at Phi Zeta Research Day January 2003.
22. Hoover, EA. 2003 Chronic wasting disease: Rocky Mountain Virology Conference. November.
23. Mathiason, CK, Sigurdson, CJ, Foos, T, Eliason, G, and Hoover, EA. 2003. Expression of cervid PrPc in Tissues of Deer. Keystone Conference TSEs. Beaver Creek, CO, April.
24. Sigurdson, CJ, Mathiason, CK, Perrott, MR, Eliason, GA, and Hoover, EA: 2003 Transmission of Chronic Wasting Disease in the Ferret. I

**PROJECT CONTACT:**

Name: Turney, L.

Phone: 970-491-6229

Email: lturney@cvmbs.colostate.edu

URL: <http://www.colostate.edu/CVEADSS>

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**ACCESSION NO:** 0097775 **SUBFILE:** CRIS

**PROJ NO:** COLV05420 **AGENCY:** CSREES COLV

**PROJ TYPE:** ANIMAL HEALTH **PROJ STATUS:** TERMINATED

**START:** 01 OCT 1998 **TERM:** 30 SEP 2004 **FY:** 2004

**INVESTIGATOR:** Niswender, G.

**PERFORMING INSTITUTION:**

College Administration

Colorado State University

Fort Collins, Colorado 80523

**BACTERIAL DISEASES AND THE IMMUNE SYSTEM.**

**OBJECTIVES:** 1) To continue development of new procedures for the rapid and reliable detection of the causative agents of bacterial diseases; 2) To develop new, more efficacious methods for the prevention of diseases caused by bacterial agents and 3) to study the pathogenic processes and epidemiology of bacterial diseases.

**APPROACH:** Improved diagnostic procedures will be developed for the detection of several important pathogenic bacterial (for example, *Brucella ovis*; *Mycobacterium ovis*; *Mycobacterium paratuberculosis* and *Clostridium perfringens*). Tests will include improved enzyme immunoassays, polymerase chain reaction to detect bacterial DNA and/or RNA, and use of fluorescently labeled recombinant DNA probes and antibodies to specific coat proteins. These reagents will be used to study the disease process and the epidemiology of individual infections. Finally, in some cases more efficacious recombinant vaccines will be developed to prevent the disease.

**PROGRESS:** 1998/10 TO 2004/09

Mice of the CBA inbred strain background expressing the well characterized mutation designated xid in the cytoplasmic signalling enzyme Bruton's protein kinase have been previously noted to illustrate shifts in T helper type 1 (Th1)/Th2 immunity which is underlined by an apparent failure to produce the regulatory cytokine interleukin-10. This study examined if this extended to infection with *Mycobacterium tuberculosis*, which also depends on Th1 immunity. Contrary to expectations, xid mice showed evidence of a transient early susceptibility to pulmonary infection, changes in macrophage morphology, and decreased activation of lung natural killer cells, while showing evidence of substantial IL-10 production and accumulation in lung lesions macrophages, but paradoxically this did not influence the course of the chronic disease. In addition, macrophages from the lungs of xid mice also expressed high levels of CD14. These observations suggest that the xid mutation in cellular signalling has much wider effects on the immune system than previously thought. In a separate study, major histocompatibility complex class I tetramer reagent was used to track antigen-specific CD8 T cells in the lungs of mice immunized with the tuberculosis vaccine candidate Mtb72F. The results show that CD8 T cells recognizing an immunodominant Mtb32-specific epitope could be detected in significant numbers over the course of infection in mice exposed to low-dose aerosol challenge with *Mycobacterium tuberculosis* and that prior vaccination substantially increased the numbers of these cells early in the lungs. The effector phenotype of the cells was shown by the demonstration that many secreted gamma interferon, but very few contained granzyme B. As the course of the infection progressed, many activated CD8 T cells down-regulated expression of CD45RB and upregulated expression of the interleukin-7 receptor alpha chain, indicating a transition of these cells to a state of memory. These data support the hypothesis that *M. tuberculosis*-specific CD8 T cells can be targeted by vaccination with the Mtb72F polyprotein.

**IMPACT:** 1998/10 TO 2004/09 *Mycobacterial* infection in dairy cattle remains a significant economic loss to producers. How the immune system responds to these infections is poorly understood. This limitation has severely

hampered the development of a vaccine effective for eliminating Mycobacterial infections (Johne's Disease) in dairy cattle. Some of these studies show that specific bacterial proteins can be used to specifically target components of the immune system, a mechanism that may lead to an effective vaccine for prevention of the multi-billion loss to the dairy industry caused by Johne's disease.

**PUBLICATIONS (not previously reported):** 1998/10 TO 2004/09

1. Junqueira-Kipnis AP, Kipnis A, Henao Tamayo M, Harton M, Gonzalez Juarrero M, Basaraba RJ, Orme IM. 2005. Interleukin-10 production by lung macrophages in CBA xid mutant mice infected with *Mycobacterium tuberculosis*. Immunology. 115:246-52.
2. Irwin SM, Izzo AA, Dow SW, Skeiky YA, Reed SG, Alderson MR, Orme IM. 2005. Tracking antigen-specific CD8 T lymphocytes in the lungs of mice vaccinated with the Mtb72F polyprotein. Infect Immun. 73:5809-16.
3. Perry JA, Olver CS, Burnett RC, Avery AC. 2005. Cutting edge: the acquisition of TLR tolerance during malaria infection impacts T cell activation. J Immunol. 174:5921-5.

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**ACCESSION NO:** 0007172 **SUBFILE:** CRIS

**PROJ NO:** CONS00118 **AGENCY:** SAES CONS

**PROJ TYPE:** STATE **PROJ STATUS:** EXTENDED

**START:** 01 JUL 1942 **TERM:** 01 JAN 2009 **FY:** 2006

**INVESTIGATOR:** Van Kruiningen, H.

**PERFORMING INSTITUTION:**

Pathobiology & Veterinary Science

Univ of Connecticut

Storrs, Connecticut 06268

Survey of Animal Diseases in Connecticut

**OBJECTIVES:** Determine the occurrence of various animal diseases in Connecticut. Laboratory diagnostic facilities are provided. The relative economic importance of various diseases is being determined. The project serves as a source of leads on diseases needing extensive investigation in the State. ]

**APPROACH:** Mammals and birds are submitted to the Department of Animal Diseases for necropsy by agricultural interests and veterinarians. Staff veterinarians of the Department do the necropsy and may save time for histopathology, bacteriology, virology, biochemistry, and serology. All cases are reported to the Commissioner of Agriculture and Natural Resources, and the clinical signs and our work-ups are filed here. This adds to the file which is continuous since 1930. If tissues are studied, slides and blocks are also saved. This approach results in an unusual museum of histopathologic material. In recent years gross color transparencies have been made of interesting cases adding to the significance of the file.

**PROGRESS:** 2006/01 TO 2006/12

The Connecticut Veterinary Medical Diagnostic Laboratory is a division of the Department of Pathobiology and Veterinary Science, University of Connecticut. There were 1660 animal cases (avian, mammalian, and aquatic) examined by the pathology services of the diagnostic laboratory. Included were 255 surgical specimens, which were generally biopsies of canine and feline neoplasms or multiple tissues from autopsies conducted by practicing veterinarians. There were 323 avian and 1337 mammalian/aquatic submissions; multiple animals were often submitted. Species examined included cats, dogs, horses, cattle, swine, goats, sheep, llamas, alpacas, wildlife, laboratory animals, aquatic mammals, fish, shellfish, domestic poultry, game birds and other avian species. Important diagnoses included infectious laryngotracheitis, pasteurellosis, salmonellosis, avian encephalomyelitis, ectoparasitism, metritis, *Streptococcus zooepidemicus* infection, coronavirus enteritis, dermatophytosis, inclusion body hepatitis, avian infectious bronchitis, air sacculitis, West Nile encephalitis, polioencephalomalacia, mastitis, pyelonephritis, colibacillosis, histomoniasis, infectious bursal disease, caseous lymphadenitis, herpesvirus infection, intussusception, pancreatitis, listeriosis, rotavirus enteritis, acute gastric dilatation, coccidiosis, aspiration pneumonia, ventricular

impaction, aspergillosis, dirofilariasis, cryptosporidiosis, canine distemper, scabies, osteomyelitis, Marek's disease, myocarditis, cardiomyopathy, traumatic reticulitis, equine laminitis, cauda equina neuritis, hemorrhagic bowel syndrome of cattle, pheohyphomycosis of seadragons, bovine virus diarrhea, staphylococcal dermatitis, gunshot trauma, feline infectious peritonitis, toxoplasmosis, ethylene glycol poisoning, feline panleukopenia, mycobacteriosis, avian tuberculosis, eastern equine encephalitis, chlamydiosis and equine protozoal myelitis.

**IMPACT: 2006/01 TO 2006/12**

This diagnostic laboratory serves an important function for the veterinary medical and animal-owning community, explaining deaths, rendering biopsy diagnoses, understanding current diseases in Connecticut and standing ready to identify new ones.

**PUBLICATIONS (not previously reported): 2006/01 TO 2006/12**

No publications reported this period

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**ACCESSION NO:** 0406145 **SUBFILE:** CRIS

**PROJ NO:** ISM-102 **AGENCY:** ERS MTED

**PROJ TYPE:** USDA INHOUSE **PROJ STATUS:** NEW

**START:** 01 AUG 2003 **TERM:** 30 SEP 2007 **FY:** 2006

**INVESTIGATOR:** Mathews, K.

**PERFORMING INSTITUTION:**

Economic Research Service

USDA/ERS

1800 M Street NW

Washington, District Of Columbia 20036

**ISM ECONOMIC IMPACTS OF ANIMAL DISEASES**

**NON-TECHNICAL SUMMARY:** The objective of the research is to measure the costs and benefits of different animal disease mitigation measures in domestic and international markets for meat and other animal products.

**OBJECTIVES:** The objective of the research is to measure the costs and benefits of different animal disease mitigation measures in domestic and international markets for meat and other animal products.

**APPROACH:** The approach will be a combination of descriptive analyses, econometric estimation of parameters, and case studies of mitigation techniques already in place.

**PROGRESS: 2005/10 TO 2006/09**

The objective of the research is to measure the costs and benefits of different animal disease mitigation measures in domestic and international markets for meat and other animal products. The spread of infectious disease among and between wild and domesticated animals has become a major problem worldwide. We analyze the socially optimal management of wildlife and livestock, including choices involving environmental habitat variables and on-farm biosecurity controls, when wildlife and livestock can spread an infectious disease to each other. The model is applied to the problem of bovine tuberculosis among Michigan white-tailed deer. The optimum is a cycle in which the disease remains endemic in the wildlife, but in which the cattle herd is depleted when the prevalence rate in deer grows too large. A second project presents a modeling framework designed to estimate the economic impacts of livestock disease outbreaks. The framework (1) combines a disease-spread model with an economic model, (2) introduces supply, demand, and trade shocks resulting from epidemiological model results into a model of the U.S. agricultural sector, and (3) the disaggregation of time into 16 quarters. A number of papers have been presented, a number of articles have been published, several more presentations and journal articles are in progress. The most recent acceptance is Fenichel, E.P., and R.D. Horan, "Gender-Based Harvesting in Wildlife Disease Management", American Journal of Agricultural Economics, which is in press. Two ERS Economic Reports are in final draft stages and an ERS Policy Brief is in progress. The projects were each given no cost extensions of 1 year to facilitate publication of the numerous products.

**IMPACT: 2005/10 TO 2006/09**

The approach will be a combination of descriptive analyses, econometric estimation of parameters, and case studies of mitigation techniques already in place. For the case of bovine tuberculosis in Michigan deer populations, we found that the ability to mitigate damages via changes in on-farm choices results in greater disease prevalence rates in deer and a smaller likelihood that eradication of deer will be an optimal strategy. In addition, a second cooperative agreement examines a hypothetical outbreak of foot-and-mouth disease (FMD) under the destruction of direct-contact herds, destruction of direct-contact and indirect-contact herds, and slaughter of all animals within a 1-km ring. Relatively few animals are destroyed, but large losses for beef, beef cattle, hogs, and pork tied to the loss of trade sharply lower prices. Other sectors experience small losses or small gains. Ring destruction always reduces the duration of an outbreak to less than 1 quarter. Because of lower prices, consumers benefit when exports are embargoed.

**PUBLICATIONS (not previously reported): 2005/10 TO 2006/09**

1. Richard Horan, Christopher A. Wolf, Eli P. Fenichel, and Kenneth H. Mathews, Jr., 2005, "Spatial Management of Wildlife Diseases", Review of Agricultural Economics (proceedings issue), Vol. 27/Issue 3, pp. 483-490
2. Horan, R.D. and C.A. Wolf, 2005, "The Economics of Managing Infectious Wildlife Disease", American Journal of Agricultural Economics, Vol. 87/Issue 3, pp. 537-551

**PROJECT CONTACT:**

Name: Mathews, K.

Phone: 202-694-5183

Fax: 202-694-5183

Email: KMATHEWS@ers.usda.gov

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**ACCESSION NO:** 0200070 **SUBFILE:** CRIS

**PROJ NO:** GEOV-0471 **AGENCY:** CSVN GEOV

**PROJ TYPE:** STATE PROJ **STATUS:** TERMINATED

**START:** 01 JUL 2003 **TERM:** 30 SEP 2003 **FY:** 2004

**INVESTIGATOR :** Quinn, F. D.

**PERFORMING INSTITUTION:**

College Of Vet Medicine

University Of Georgia

110 Riverbend Road

Athens, Georgia 30602

**ZEBRAFISH AS A MODEL FOR MYCOBACTERIUM SHOTTSII PATHOGENESIS**

**NON-TECHNICAL SUMMARY:** An epizootic of mycobacteriosis in striped bass is occurring in the Chesapeake Bay and other areas on the eastern sea coast. These infections are caused primarily by *Mycobacterium shottsii*, a close relative of *M. tuberculosis* and a newly characterized species. We need to understand the etiology of this disease due to its potential impact on commercial fishing and effects on workers and residents near the affected waterways. We will begin to elucidate virulence mechanisms of *M. shottsii* using the zebrafish model system.

**OBJECTIVES:** Mycobacterial infections within a host are controlled through phagocytosis and intracellular killing by activated macrophages. If this initial control step is unsuccessful, the infected macrophages prime the formation of differentiated structures called granulomas that function to contain the infection and facilitate the persistence or latency of the pathogen in a decreased metabolic state for years. Mycobacterial granulomas analyzed from various mammalian, amphibian and fish species have shown that these structures are composed of similar cell types, primarily macrophages, and in similar cellular proportions; a possible indication of the evolutionary association between mycobacterial pathogens and their vertebrate hosts. Striped bass, a primary target species of *M. shottsii* infection, produce a significant granulomatous response in the skin and internal organs after infection with this agent. Experimentally, striped bass are not a convenient model system to examine *M. shottsii* pathogenesis and the host immune response due primarily to its large size and the lack of available immunological and genetic tools and reagents. Alternatively, zebrafish, which also

produce granulomas in response to *M. shottsii* infection and whose macrophages actively phagocytose the invading pathogen, is becoming the preeminent fish model system for infectious disease investigations. Thus, our hypothesis is that the mycobacterial disease process for *M. shottsii* in zebrafish mimics the analogous (innate) immune response in striped bass. With this in mind, we will: 1) detail the infectious process in the zebrafish, focusing on tissue destruction and granuloma formation, and 2) isolate zebrafish primary macrophages, infect them, and examine the ability of the mycobacteria to replicate intra- or extracellularly.

**APPROACH:** The experimental approach will establish an in vivo infection model in zebrafish. Fish will be injected with virulent mycobacteria and lesions will be identified and characterized. The second project is to infect short term cultured zebrafish macrophages. This will enable studies of bacterial adherence, internalization and intracellular growth. *M. shottsii* will be grown at 23°C to logarithmic phase, diluted and viable count determined. Groups of 30 adult zebrafish will be inoculated intraperitoneally with 10<sup>5</sup>, 10<sup>3</sup>, or 10<sup>2</sup> colony-forming units (CFU) of *M. shottsii* in PBS in 50 µl volumes in PBS. Samples of liver and spleen will be collected at various time points, homogenized in PBS with 0.05% Tween 80 and bacterial counts determined by plating on agar medium. Bacteria will be confirmed as *M. shottsii* using species-specific PCR primers. This procedure will determine in vivo distributions of infected zebrafish. In order to determine if *M. shottsii* will attach, enter and multiply within zebrafish macrophages in a manner and at a rate analogous to that observed for pathogenic mycobacteria in mammalian macrophages, the following standard assays will be performed. Primary zebrafish macrophage cells will be removed from the peritoneal cavity and identified by flow cytometry. Cells of appropriate size and granularity will be (sterile) sorted. Sorted cells will be seeded at a density of 5X10<sup>4</sup> cells per well in 48-well plates and left at 25°C for 24 hours. The medium will be replaced before use and bacteria will be added to achieve a multiplicity of infection (MOI) of 10. The infection will proceed for 2 hours at 25°C after which the macrophages will be washed and incubated in fresh medium plus 200 µg/ml amikacin for 1 hour to kill extracellular bacteria (MIC of amikacin for *M. shottsii* is 30 µg/ml). In order to determine the number of intracellular bacteria at this basal time point, the cells will be washed once in PBS and lysed by adding 1 ml of 0.1% Triton X-100 for 10 min. Dilutions will be plated to determine the number of intracellular CFU. For long term intracellular growth assays, fresh medium plus 30 µg/ml of amikacin will be added after the medium containing the 200 µg/ml amikacin is removed. The cells will be incubated for various times up to 14 days before being lysed, plated and percent survival determined for each time point. Adherence assays will be carried out in a similar fashion except that bacteria will be added to the cells and within 15 min. will be washed five times with PBS prior to lysis. Microscopic observations will be performed using infections at a MOI of 10 with and without amikacin on coverslips in 24-well dishes. Ziehl-Neelsen stained cells will be examined. Transmission electron microscopy also will be used to examine the ultrastructure and membrane trafficking of *M. shottsii*-infected macrophages.

**PROGRESS:** 2003/07 TO 2003/09

We conducted experiments to determine if macrophages in the zebrafish embryo responded to mycobacterial infection with the formation of granulomas. We injected approximately 50 viable *M. marinum* or *M. shottsii* bacilli (expressing green fluorescent protein) into the brain cavities of 1-day old embryos, or the heart cavities of 2-day old embryos. Injected embryos were examined 24 or 48 h post-injection under a compound microscope with Fluorescent and DIC optics. Whereas *Escherichia coli* and *Bacillus subtilis* bacilli were cleared from embryos within 5-6 hours after injection, mycobacteria persisted in embryos for at least 48 hours, the latest time-point examined. This indicated that, as in adults, *M. marinum* and *M. shottsii* bacilli avoid destruction by the embryonic immune system. The fluorescent bacteria were associated with cells approximately 10 micrometers in diameter, the size of macrophages in zebrafish embryos. Cells associated with bacteria appear in clumps, ranging from 3 cells to more than a dozen. Our data strongly suggest that the zebrafish immune system is capable of responding to *M. marinum* and *M. shottsii* infection by forming granuloma-like structures. Zebrafish embryos are convenient for making in vivo microscopic observations, however, the numbers of macrophages that can be acquired for routine study is low. We, therefore, developed a technique for acquiring large numbers of macrophages infected in vivo from adult zebrafish. Adult zebrafish (2 centimeters or more in length) were injected with a PBS:Mineral Oil and Dextran-rhodamine suspension along with 50 viable *M. shottsii* or *M. marinum* bacilli (expressing green fluorescent protein). Fifty microliters of solution was injected per fish peritoneal cavity. Seventy-two hours later the fish were euthanized and contents of the peritoneal cavity were harvested. The fluid was then analyzed using a Coulter EPICS XL flow cytometer. Approximately 10% of the peritoneal exudates cells contained Dex-Red and green fluorescent protein. This experiment demonstrated that with a signal as strong as that occurring in the second decade of a log scale, it will be possible not only to enumerate total peritoneal phagocytes, but

also to sort out a collection of the Dex-Red positive cells infected with bacilli will be feasible.

**IMPACT:** 2003/07 TO 2003/09

Mycobacterial granulomas analyzed from various mammalian, amphibian and fish species have shown that these structures are composed of similar cell types, primarily macrophages, and in similar cellular proportions; a possible indication of the evolutionary association between mycobacterial pathogens and their vertebrate hosts. Striped bass, a primary target species of *Mycobacterium shottsii* infection, produce a significant granulomatous response in the skin and internal organs after infection with this agent. Experimentally, striped bass is not a convenient model system to examine *M. shottsii* pathogenesis and the host immune response due primarily to its large size and the lack of available immunological and genetic tools and reagents. Alternatively, zebrafish, which also produce granulomas in response to *M. shottsii* infection and whose macrophages actively phagocytose the invading pathogen, is becoming the preeminent fish model system for infectious disease investigations. The research presented here will ultimately benefit mycobacterial disease investigators and the zebrafish research community. The former by elucidating basic mechanisms of cellular immunity that should lead to new methods of diagnosis, treatment, or control of fish populations with *M. shottsii* infections and the latter through the sharing of novel reagents and techniques for this important animal model.

**PUBLICATIONS (not previously reported):** 2003/07 TO 2003/09

No publications reported this period

**PROJECT CONTACT:**

Name: Quinn, F. D.

Phone: 706-542-5790

Fax: 706-542-5771

Email: fquinn@vet.uga.edu

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**ACCESSION NO:** 0405020 **SUBFILE:** CRIS

**PROJ NO:** 3625-32000-063-00D **AGENCY:** ARS 3625

**PROJ TYPE:** USDA INHOUSE **PROJ STATUS:** TERMINATED

**START:** 27 OCT 2001 **TERM:** 26 OCT 2006 **FY:** 2006

**INVESTIGATOR:** Palmer M V; Waters W R

**PERFORMING INSTITUTION:**

Agricultural Research Service

Ames, Iowa 50010

**DIAGNOSIS AND CONTROL OF TUBERCULOSIS IN LIVESTOCK AND WILDLIFE**

**OBJECTIVES:** Develop and evaluate improved tests for diagnosis of *Mycobacterium bovis* infection in different animal species; Develop improved methods for differentiation of *M. bovis* isolates; Characterize *M. bovis* infection in domestic livestock and wildlife. Identify vaccine strategies to elicit protective immunity in cattle and relevant wildlife against *Mycobacterium bovis*.

**APPROACH:** Sensitivity and specificity of tests for detection of *M. bovis* infection in live animals will be determined. We will determine if new antigens can be used to improve skin tests and in-vitro diagnostic tests. Improved PCR assays for direct detection of *M. bovis* in various specimens will be developed by modification of existing tests. Improved methods for isolation of *M. bovis* from various samples will be developed by changing processing methods and decontaminants. Improved methods for DNA fingerprinting of *M. bovis* isolates will be developed by adapting published methods. Animals will be exposed to *M. bovis* by different routes and clinical signs, immune system parameters, and lesion distribution will be monitored. Routes of transmission of *M. bovis* from infected animals to uninfected animals will be assessed by periodic sampling of oral and nasal secretions, urine, and feces. BSL-3; (IBC-

#0239) canceled 10/05/04. BSL-2/BSL-2N; Recertified May 11, 2006. IBC #0278. BSL-Exempt; Recertified June 8, 2006. IBC #0269. BSL-2/BSL-2N; Recertified May 14, 2006. IBC#0264. BSL-Exempt; (IBC-#0283) 01/12/06. BSL-2/BSL-1N/BSL-3N; Certified June 1, 2006. IBC#0285.

## **PROGRESS: 2001/10 TO 2006/10**

Progress Report 1. What major problem or issue is being resolved and how are you resolving it (summarize project aims and objectives)? How serious is the problem? Why does it matter? The "Diagnosis and Control of Tuberculosis in Livestock and Wildlife" Research Project is aligned with NP 103 Animal Health. Bovine tuberculosis, which is caused by *Mycobacterium bovis*, is an infectious disease that affects many species of animals as well as human beings. Animals infected with *M. bovis* can shed organisms as they exhale or cough and in various secretions including saliva, milk, feces and urine. Elimination of animals infected with *M. bovis* is important to prevent the spread of disease among animals and to human beings. The US initiated a program to eradicate tuberculosis from cattle in 1917 when the prevalence of disease was approximately 5%. In general, the eradication program has been successful and today, less than 0.002% of cattle are infected with *M. bovis*. However, a low prevalence of disease has persisted and it has not been possible to eradicate bovine tuberculosis from the US using available technology. Moreover, in the last 5 years agriculturally important states such as California, Texas, Minnesota and Michigan have lost their TB-free status due to the presence of *M. bovis* infected cattle herds. It is estimated that loss of TB free status will cost livestock producers in these states from \$2.55 billion in Texas to \$156 million in Michigan over the next 10 years. Improved diagnostic tests and control measures are needed to detect and eliminate cattle that have bovine tuberculosis. Tuberculosis has been detected in captive deer and elk and in wild white-tailed deer, coyotes, raccoons, bear, bobcat, opossum, and fox. There is epidemiological evidence to demonstrate that tuberculosis has been transmitted between deer to cattle. The presence of tuberculosis in wildlife poses a serious threat to the national eradication program due to spillover of disease from wildlife to domestic animals and the difficulty of eliminating an infectious disease from a wild population. Other countries with tuberculosis in wildlife have been unable to eradicate tuberculosis from domestic livestock. The Bovine Tuberculosis Research Project at the National Animal Disease Center (NADC) is conducting research to develop a better understanding of the interactions between various host species and *M. bovis*, including immune response, disease progression and interspecies transmission. This information will be used to develop improved diagnostic tests, vaccines and strategies to minimize disease transmission. Bovine tuberculosis is considered a public health threat because human beings can become infected with *M. bovis* through contact with infected animals or by ingestion of contaminated food and milk. Elimination of tuberculosis from cattle is important to provide food and milk to the public that is free of *M. bovis*. Elimination of bovine tuberculosis from domestic livestock is also important to maintain free international trade. Trade restrictions between the US and Canada and between Mexico and the US have occurred because of bovine tuberculosis. Eradication of tuberculosis from wildlife is important to prevent transmission of disease between wildlife and domestic livestock. The Bovine Tuberculosis Research Project is assigned to the Animal Health National Program 103 (100%) and relates to the vision of this program to ensure animal health through improved disease detection and control. Specifically, the objectives of the project are to: 1) develop and evaluate improved tests for diagnosis of tuberculosis in cattle, deer, and other species, which relates to the component on Pathogen Detection; 2) develop improved methods for differentiation of *M. bovis* isolates, which relates to the component on Epidemiology of Disease; 3) define interactions between various host species and *M. bovis*, which relates to the component on Host/Pathogen Interaction; and 4) develop and evaluate vaccines for control and prevention of tuberculosis in animals, which relates to the component on Disease Control Strategies. Cattle as well as bison and all species of Cervidae are subject to testing for tuberculosis under the guidelines of the USDA uniform rules and methods for the eradication of bovine tuberculosis. The most common means of testing is the tuberculin skin test. Tuberculin skin testing lacks specificity and has not been fully validated in all species of Cervidae. Especially problematic is the absolute lack of specificity associated with tuberculin skin testing in reindeer. The Animal and Plant Health Inspection Service (APHIS) of the USDA has provided funds for NADC to conduct research on tuberculosis in various species of Cervidae (3625- 32000-063-01R). The objectives of such research are to study immune responses of Cervidae and develop improved methods of antemortem diagnosis of tuberculosis in these species. Such objectives are consistent with the National Program as stated above.

2. List by year the currently approved milestones (indicators of research progress)

Year 1 (FY 2002) Develop aerosol model of inoculation of *M. bovis* for use in large animal species. Evaluate blood based assays of cell mediated immunity for diagnosis of *M. bovis* infection in both cattle and deer. Continue evaluation of mechanisms of transmission of *M. bovis* between wildlife and cattle.

Year 2 (FY 2003) Validate aerosol model of inoculation of *M. bovis* for cattle and deer. Compare resulting disease in cattle with that seen naturally. Begin evaluation of blood based assay measuring gamma interferon (Cervigam assay) as a means of diagnosis of *M. bovis* infection in white-tailed deer.

Evaluate other promising blood based assays of cell mediated immunity of diagnosis of *M. bovis* infection in cattle and deer such as the nitric oxide (NO) assay. Examine deer to deer transmission of *M. bovis* by investigating doe to fawn transmission through milk. Continue evaluation of shared feed as a means of transmission of *M. bovis* between wildlife and cattle. Begin study of reindeer immune system to aid in development of improved diagnostic test for *M. bovis* infection in reindeer. Year 3 (FY 2004) Use aerosol inoculation model of cattle in evaluation of efficacy of experimental vaccine candidates. Continue evaluation of aerosol inoculation of white-tailed deer with *M. bovis*. Compare disease with naturally occurring tuberculosis. Continue evaluation and validation of gamma interferon assay, nitric oxide assay and others as methods of antemortem diagnosis of *M. bovis* infection in cattle and deer. Experimentally infect reindeer with *M. bovis* to evaluate accuracy of current and experimental diagnostic tests in know *M. bovis* infected reindeer. Year 4 (FY 2005) Continue use of aerosol inoculation model of cattle in evaluation of efficacy of experimental vaccine candidates and investigation of immune responses of cattle to infection and vaccination. Evaluate alternative antigens for use in blood based assays for diagnosis of *M. bovis* infection in cattle and deer. Evaluate their specificity by examining cattle infected with other species of mycobacteria. Evaluate serological assays as a method of diagnosis of *M. bovis* infection in cattle and deer. Complete evaluation of diagnostic tests for *M. bovis* infection in reindeer. Begin evaluation of potential vaccines for prevention of *M. bovis* infection in wildlife (white-tailed deer) by evaluating the safety and efficacy of the human tuberculosis vaccine, *M. bovis* strain BCG Year 5 (FY 2006) Continue use of aerosol inoculation model of cattle in evaluation of efficacy of experimental vaccine candidates and investigation of immune responses of cattle to *M. bovis* infection or vaccination. Continue evaluation of serological assays as a method of diagnosis of *M. bovis* infection in cattle and deer. Continue evaluation of alternative antigens to increase sensitivity and/or specificity in both in vivo and in vitro diagnostic tests for *M. bovis* infection in cattle and deer. Continue evaluation of potential vaccines for prevention of *M. bovis* infection in wildlife (white-tailed deer) by evaluating the efficacy of various vaccine preparations and adjuvants. 4a List the single most significant research accomplishment during FY 2006. This accomplishment aligns with the Disease Control Strategies component of the NP103 Animal Health Action Plan. The first trial was completed to examine the efficacy of *M. bovis* BCG as a vaccine to prevent tuberculosis in white-tailed deer. Results of the trial are encouraging suggesting that vaccination with BCG may be effective in decreasing the severity of disease in deer and consequently decreasing the ability of deer to transmit *M. bovis* to other deer or to livestock. The completion of this first trial is significant as these results will serve as the basis for subsequent trials that will investigate other parameters such as comparative efficacy of various strains of *M. bovis* BCG, oral vs parenteral routes of vaccination, vaccine safety, etc. 4b List other significant research accomplishment(s), if any. This accomplishment aligns with both the Host/Pathogen Interaction and Pathogen Detection components of the NP103 Animal Health Action Plan. We continue evaluation of several serological tests for *M. bovis* infection in cattle and deer. Preliminary findings have identified several tests that may prove useful for diagnosis of tuberculosis in various species including cattle and deer. These serological tests will be faster, cheaper and technically less difficult than blood based assays of cell mediated immunity. We are currently evaluating the sensitivity and specificity of these tests in both cattle and deer. The only approved test for tuberculosis in deer is the intradermal tuberculin test. Currently less than 6% of the captive deer in the US are tested annually for tuberculosis. This is due in part to difficulties using the intradermal tuberculin test in this species. An accurate blood-based assay would significantly improve producer participation in the testing program and increase the ability of USDA to detect tuberculosis in captive deer. This test is also being evaluated in free-ranging deer in a trap and test program in Michigan. This work is being done in collaboration with scientists at ChemBio Diagnostics, Medford, NY, Iowa State University, Ames, IA, and the Michigan Department of Natural Resources, with financial assistance from the subordinate CRIS, 3625- 32000-063-01R, a reimbursable agreement with USDA/APHIS. 4c List significant activities that support special target populations. Presentations were made to the Reindeer Owners and Breeders Association, North America Elk Breeders Association and North American Deer Farmers Association on advances in the diagnosis of tuberculosis in farmed deer. Significant advances have been made in development of improved blood- based tests to diagnose tuberculosis in deer. Some tests have received conditional approval through USDA's Center for Veterinary Biologics. Since 1990, deer have been tested for tuberculosis in a manner similar to that used for cattle as part of the USDA's bovine tuberculosis eradication program. These tests were not specifically designed for deer, but rather the tests used for cattle were applied to deer. These tests, however, have not performed as well in deer as they have in cattle creating 2 primary problems for deer farmers; 1) There are many more false positive test results in deer than there are in cattle. This results in the unnecessary euthanasia of deer that do not really have tuberculosis, creating a hardship for producers due to animal losses, financial losses, prolonged quarantines, animal movement restrictions and lost market opportunities. 2) Because the testing procedure currently used involves handling the animals multiple times, there is significant opportunity for injuries to deer due to their fractious nature. Blood- based assays designed specifically for

deer would enhance the accuracy of testing in deer species and eliminate the need for repeated animal handling. Such tests would decrease overall costs to producers as well as expedite the USDA's bovine tuberculosis eradication program, which was implemented in large part due to public health concerns, as bovine tuberculosis is a zoonotic disease transmissible to humans. Additional research on blood-based tests for tuberculosis in deer is planned as part of our 5 year project plan. Updates will be provided to deer producer groups as needed.

5. Describe the major accomplishments to date and their predicted or actual impact. These accomplishments align with the pathogen detection, epidemiology of disease, host/pathogen interaction, and disease control strategies components of the NP103 Animal Health Action Plan. A new test, the polymerase chain reaction (PCR) for detection and identification of *M. bovis* in tissue samples collected for microscopic examination was developed. When animals are slaughtered, meat inspectors collect tissue samples from animals that are suspected of having tuberculosis. Tissue samples are examined for microscopic evidence of tuberculosis and for the presence of organisms. Stains used to detect *M. bovis* in a tissue sample also stain other organisms making it impossible to identify the organism in the sample. The new test detects a specific piece of DNA that is present only in organisms that cause tuberculosis. The new test permits more accurate and rapid identification of animals with tuberculosis than was previously possible. The test is used extensively at the request of state and federal regulatory officials to confirm suspected cases of tuberculosis in animals. This technology has been transferred to USDA, APHIS and has allowed more rapid confirmation of tuberculosis, allowing epidemiologic investigation to start much earlier than was previously possible. Quarantine times for producers are reduced and continued spread of disease through animal movements is minimized. A method to differentiate strains of *M. bovis* was developed. Differences among various strains of *M. bovis* can be identified by using specific genetic markers. Using these markers, it is possible to determine if different animals are infected with a common strain or different strains of *M. bovis*. This technology has been transferred to USDA, APHIS. This information is used by epidemiologists to determine possible sources of infection in outbreaks of tuberculosis in animals. An interferon gamma blood based assay for the diagnosis of tuberculosis in cattle is currently available. NADC scientists, in cooperation with USDA, APHIS and various state agencies evaluated the accuracy of this assay compared to traditional skin testing. In FY03 such research allowed the approval of the interferon gamma assay for use in cattle. In many cases this test has replaced the previously used comparative cervical skin test, thereby decreasing animal handling costs, decreasing time to diagnosis, decreasing quarantine time and expediting epidemiological investigations. An experimental model of tuberculosis in white-tailed deer was developed using intratonsillar inoculation. The resulting disease is very similar to that observed in naturally infected deer. This model has been used extensively by NADC scientists to study the transmission of tuberculosis among deer and between deer and cattle and has demonstrated that deer can transmit *M. bovis* to other deer or cattle through indirect contact such as the sharing of feed. Subsequent epidemiological investigations have supported these findings and shown an association between supplemental feeding and disease prevalence. This information has been used by Michigan wildlife and agricultural officials to lobby for the banning of supplemental feeding of wildlife to control the tuberculosis outbreak in northern Michigan. This model has also been used to develop and evaluate improved tests for diagnosis of tuberculosis in deer and to determine the effectiveness of vaccines to prevent infection. This model is currently being used by investigators in other countries ( Canada) to examine tuberculosis in red deer and elk. Current surveys to determine the prevalence of tuberculosis in wild white-tailed deer are based on examination of tissues in the head to detect lesions. In a study that involved detailed examination of the entire deer carcass, we determined that about 35-50% of the naturally infected deer did not have lesions in the head. This underestimation of disease prevalence should be considered when estimating prevalence through surveillance efforts that focus on examination of grossly visible lesions of the head only. A safe, reliable, and reproducible method of aerosol delivery of *M. bovis* to cattle, or other large ruminants was developed and validated by scientists at NADC. Aerosol exposure is believed to be a primary means of *M. bovis* transmission between cattle. NADC scientists conducted the first studies on aerosol exposure of *M. bovis* in cattle. These studies have shown that this method of exposure results in lesions similar to those seen in naturally infected cattle. Such a delivery method is being used at NADC to investigate disease pathogenesis, transmission, immune responses, and vaccine efficacy and could be used to deliver other pathogens of cattle where aerosol delivery is critical. In contrast, aerosol exposure of deer to *M. bovis* did not result in disease similar to that seen in naturally infected deer, further supporting the hypothesis that transmission of *M. bovis* between deer involves routes such as sharing of feed and that aerosol transmission may be less important. The outbreak of tuberculosis in white-tailed deer in Michigan, identified in 1995, represents the first wildlife reservoir of *M. bovis* in North America and a serious threat to the federal bovine tuberculosis eradication effort. ARS scientists at NADC demonstrated that *M. bovis* can be transmitted between deer in close contact, through the sharing of feed and to deer fawns through milk containing *M. bovis*. These results document that contaminated milk, in addition to saliva, nasal secretions, urine and feces may be involved in transmission of *M. bovis* between deer. Such information is vital for state

and federal officials to make educated decisions concerning disease control strategies. Currently, tuberculin skin testing is the most common method of antemortem testing of deer for tuberculosis; however, tuberculin skin testing of deer lacks specificity and requires the capture and handling of animals at least twice for testing. ARS scientists at NADC have investigated various blood-based assays for the diagnosis of tuberculosis in deer species common in North America. Such tests would decrease overall cost to producers, animal stress and time to diagnosis. Serological assays are particularly appealing and may be useful for screening animals in field situations. Research on improved diagnosis of tuberculosis in Cervidae has resulted in a change in the interpretation of tuberculin skin testing results in reindeer by state and federal veterinarians. Based on ARS research a new scattergram was adopted by USDA, APHIS for interpretation of the skin test in reindeer that results in decreased numbers of false positive results, decreased destruction of non-infected animals, and decreased cost to USDA. Research on blood based diagnostic assays has resulted in the recommendation by the USAHA in 2003 that the gamma interferon assay for deer (Cervigam) be evaluated side by side with skin testing to determine if this blood based assay may be a suitable replacement for skin testing. Serological assays developed or evaluated by NADC scientists are being used to assist Michigan wildlife officials in screening of large numbers of trapped wild deer as an approach to selectively remove tuberculous deer. Research on an assay to detect nitric oxide as a means of antemortem diagnosis of tuberculosis was patented by ARS. Research on alternative antigens for use in tuberculosis diagnostics has yielded several potential candidates that may increase specificity of these tests, thereby decreasing the number of false positive results caused by exposure of animals to environmental non-tuberculous mycobacteria. ARS has identified one candidate, the fusion protein ESAT-6:CFP-10. Field trials in Michigan have begun to evaluate the ability of the fusion protein to improve the specificity of the existing test (Bovigam). NADC conducted the first efficacy trials of vaccines to prevent tuberculosis in white-tailed deer. The first trial tested the human TB vaccine, *M. bovis* BCG. Results were encouraging suggesting that vaccination may decrease disease severity, thus decreasing the potential for disease transmission between deer or from deer to cattle. This first trial will serve as the foundation for various subsequent studies. Diseases at the interface of wildlife and domestic animals have become increasingly important. The study of infectious diseases in wildlife is costly and challenging and very few institutions are involved in such research involving agents requiring bio-containment. NADC has been visited by scientists from the Foreign Animal Disease Lab at Plum Island, Canada's National Center for Foreign Animal Diseases in Winnipeg, and other laboratories to observe how NADC scientists conduct such research. The impact of the overall wildlife research at NADC has been that NADC scientists are consulted regularly on research in wildlife in bio- containment involving BL-3 agents, foreign animal diseases, etc.

6. What science and/or technologies have been transferred and to whom? When is the science and/or technology likely to become available to the end- user (industry, farmer, other scientists)? What are the constraints, if known, to the adoption and durability of the technology products? In FY05-FY06, a field study to evaluate ESAT-6:CFP-10 was initiated with technology transferred to USDA/APHIS and Michigan State University. In FY06, USDA/APHIS continued the use of a modified scattergram for interpretation of skin testing in reindeer based on research findings of NADC scientists. This modified interpretation has been adopted nation- wide as the current approved method of interpretation. During FY06, NADC scientists presented research findings on improved diagnostic tests for cattle and Cervidae to producer groups at international, national and regional meetings. During FY06 NADC scientists presented research findings on improved diagnosis of tuberculosis through use of the interferon gamma assay and serological assays in cattle and deer at various meetings of wildlife and agricultural officials. During FY06 NADC scientists presented research findings on the transmission of *M. bovis* between deer and from deer to cattle at various meetings of wildlife and agricultural officials. These officials have used such findings to lobby legislators for a ban on supplemental feeding of wildlife to control tuberculosis. During FY06 NADC scientists presented research findings on vaccination of white-tailed deer with *M. bovis* BCG to the Michigan Departments of Agriculture and Natural Resources.

7.

List your most important publications in the popular press and presentations to organizations and articles written about your work. (NOTE: List your peer reviewed publications below).

## **PUBLICATIONS:**

1. Palmer M.V., T.C. Thacker, and W.R. Waters. 2006. Vaccination of white- tailed deer with *Mycobacterium bovis* bacillus Calmette Guérin (BCG). Michigan Bovine Tuberculosis 11th Annual Meeting, Lansing MI (Invited Lecture).
2. Waters W.R. 2006. Tuberculosis tests for Cervids: Looking past the new rules. North American Deer Farmers Association Annual Meeting, Pittsburgh, PA (Invited Lecture).
3. Update on tuberculosis research in Cervidae. Reindeer Owners and Breeders Association National Meeting. July 2006.

4. Update on tuberculosis diagnostics research in cattle. National Milk Producers Federation Animal Health Meeting. April 2006.
5. Diagnosis of *M. bovis* infection in white-tailed deer using IFN-gamma RNA. United States Animal Health Association, Tuberculosis Scientific Advisory Subcommittee. Nov 2005.
6. Using white-tailed deer as laboratory animals. American Association of Laboratory Animal Science. May 2005.
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**ACCESSION NO:** 0408013 **SUBFILE:** CRIS

**PROJ NO:** 3625-32000-063-02R **AGENCY:** ARS 3625

**PROJ TYPE:** USDA INHOUSE **PROJ STATUS:** TERMINATED

**START:** 09 DEC 2003 **TERM:** 30 SEP 2004

**INVESTIGATOR:** Palmer M V; Waters W R; Whipple D L

**PERFORMING INSTITUTION:**

Agricultural Research Service  
Ames, Iowa 50010

**IMPROVED DIAGNOSIS OF TUBERCULOSIS IN CERVIDAE**

**OBJECTIVES:** Evaluate immune responses of reindeer sensitized to *Mycobacterium bovis* BCG; Evaluate immune responses and diagnostic tests in reindeer experimentally infected with pathogenic *M. bovis*; Evaluate lesions in reindeer experimentally infected with *M. bovis*; Evaluate immune responses and lesion development in white-tailed deer experimentally infected with *M. bovis*.

**APPROACH:** A group of reindeer will be sensitized with *M. bovis* BCG and matched with a group of non-sensitized control animals. Blood samples will be collected and skin tests will be conducted periodically throughout the study period. Various immune function assays will be conducted to monitor immune responses. In the second study, reindeer will be challenged with virulent *M. bovis*. Blood samples will be collected and skin tests will be conducted similar to the first study. In addition, tissue samples will be collected at various times to characterize the progression of disease in reindeer. White-tailed deer will be experimentally challenged with *M. bovis* using two routes of inoculation and three dosages. Immune responses will be monitored by evaluating blood collected at various times and conducting skin tests. Lesions will be characterized at the conclusion of the study. BSL 3 recertified through 10/15/04. (IBC 239)

**PROGRESS:** 2003/12 TO 2004/09

4d Progress report. This report serves to document research conducted under a reimbursable agreement between ARS and USDA-Animal and Plant Health Inspection Service (APHIS)- Veterinary Services. Additional details of research can be found in the report for the parent project 3625-32000-063-00D Diagnosis and control of tuberculosis in livestock and wildlife. Cattle, as well as bison, and all species of Cervidae are subject to testing for tuberculosis under the guidelines of the USDA uniform rules and methods for the eradication of bovine tuberculosis. The most common means of testing is the tuberculin skin test. Tuberculin skin testing lacks specificity and has not been fully validated in all species of Cervidae. Moreover, handling of deer multiple times for skin testing results in unacceptable high losses due to stress and injury to these wildlife species. The APHIS of the USDA has provided funds for NADC to conduct research on improved methods of diagnosis of tuberculosis in Cervidae. The objectives of such research are to study the immune response of tuberculous deer and develop an improved method of antemortem diagnosis of tuberculosis for use in multiple deer species. White-tailed deer and reindeer have been experimentally infected with *M. bovis* and skin

testing as well as blood- based assays were evaluated. Results show that several blood based assays that measure either cell mediated or humoral immunity have promise and may have an application in TB testing of captive as well as free-ranging deer populations. Using non-infected deer from private producers the specificity is being evaluated of one particular assay (Cervigam). The goal is to evaluate 200 samples from each of 4 deer species (white-tailed, elk, fallow, reindeer) to determine the level of false positive responses in non-infected deer. Currently we are at approximately 25% of our goal.

**PUBLICATIONS (not previously reported):** 2003/12 TO 2004/09

No publications reported this period.

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**ACCESSION NO:** 0409750 **SUBFILE:** CRIS

**PROJ NO:** 3625-32000-063-03R **AGENCY:** ARS 3625

**PROJ TYPE:** USDA INHOUSE **PROJ STATUS:** TERMINATED

**START:** 31 OCT 2004 **TERM:** 30 SEP 2005 **FY:** 2005

**INVESTIGATOR:** Palmer M V; Waters W R

**PERFORMING INSTITUTION:**

Agricultural Research Service

Ames, Iowa 50010

**BLOOD BASED ASSAYS FOR DIAGNOSIS OF TUBERCULOSIS IN CERVIDAE**

**OBJECTIVES:** Evaluate immune responses and diagnostic tests in white-tailed deer experimentally infected with pathogenic *M. bovis*. Evaluate immune responses and lesion development in white-tailed deer experimentally infected with *M. bovis*.

**APPROACH:** White-tailed deer will be experimentally challenged with *M. bovis*. Immune responses will be monitored by evaluating blood collected at various times and conducting skin tests. Lesions will be characterized at the conclusion of the study. Various blood-based assays of cell-mediated and humoral immune responses will be evaluated. BSL 3 recertified through 10/15/05 (IBC 239)

**PROGRESS:** 2004/10 TO 2005/09

Progress Report 4d Progress report. This report serves to document research conducted under a reimbursable agreement between ARS and USDA-Animal and Plant Health Inspection Service (APHIS)- Veterinary Services. Additional details of research can be found in the report for the parent project 3625-32000-063-00D Diagnosis and control of tuberculosis in livestock and wildlife. Cattle, as well as bison, and all species of Cervidae are subject to testing for tuberculosis under the guidelines of the USDA uniform rules and methods for the eradication of bovine tuberculosis. The most common means of testing is the tuberculin skin test. Tuberculin skin testing lacks specificity and has not been fully validated in all species of Cervidae. Moreover, handling of deer multiple times for skin testing results in unacceptable high losses due to stress and injury to these wildlife species. The APHIS of the USDA has provided funds for NADC to conduct research on improved methods of diagnosis of tuberculosis in Cervidae. The objectives of such research are to study the immune response of tuberculous deer and develop an improved method of antemortem diagnosis of tuberculosis for use in multiple deer species. White-tailed deer and reindeer have been experimentally infected with *M. bovis* and skin testing as well as blood- based assays were evaluated. Results show that several blood based assays that measure either cell mediated or humoral immunity have promise and may have an application in TB testing of captive as well as free-ranging deer populations. Using non-infected deer from private producers the specificity of various tests is also being evaluated. The goal is to evaluate 200 samples from each of 4 deer species (white-tailed, elk, fallow, reindeer) to determine the level of false positive responses in non-infected deer. Currently we are at approximately 25%-75% of our goal for most species.

**PUBLICATIONS (not previously reported):** 2004/10 TO 2005/09

No publications reported this period.

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**ACCESSION NO:** 0407520 **SUBFILE:** CRIS  
**PROJ NO:** 3625-32000-070-05G **AGENCY:** ARS 3625  
**PROJ TYPE:** USDA CONTRACT **PROJ STATUS:** TERMINATED  
**START:** 29 JUL 2003 **TERM:** 30 SEP 2003 **FY:** 2003

**INVESTIGATOR:** Ridpath J F; Roth J A; Palmer M V; Murray P K

**PERFORMING INSTITUTION:**

College Of Veterinary Medicine  
Iowa State University  
Ames, Iowa 50011

**DISEASES AT THE INTERFACE BETWEEN DOMESTIC LIVESTOCK AND WILDLIFE SPECIES**

**OBJECTIVES:** Support for a national meeting entitled "Diseases at the Interface Between Domestic Livestock and Wildlife Species," July 17 and 18, 2003, held by the Institute for International Cooperation in Animal Biologics (IICAB), at Iowa State University in Ames, Iowa. The transmission of diseases between domestic animals and wildlife species is concern for both those involved in agricultural production and those involved in wildlife conservation. The purpose of this meeting is to promote the exchange of information and foster discussion regarding wildlife-livestock disease interaction.

**APPROACH:** Abstracts of meeting presentations will be available in the conference proceedings and on the NADC website. This will enable scientist, producers, diagnosticians, wildlife managers and government official to access the information presented. Representatives from the veterinary biologics industry, producer groups, government agencies and veterinary colleges are expected to attend the meeting. The organizing committee is anticipating 150 to 200 attendees.

**PROGRESS:** 2003/07 TO 2003/09

4. What were the most significant accomplishments this past year? D. Progress Report. This report serves to document support for a conference under an outgoing grant between ARS and Iowa State University. Additional details of research can be found in the report for the parent project 3625-32000-070- 00X, Tools for Differentiation of High Consequence Pathogens and Endemic Viruses. This agreement funded a meeting held in Ames, Iowa on July 17 and 18 of 2004. This meeting was organized because the transmission of diseases between domestic animals and wildlife species is concern for both those involved in agricultural production and those involved in wildlife conservation. The objective was to promote the exchange of information and foster discussion regarding wildlife-livestock disease interaction. There were a total of 183 attendees. Of these, 39 were from educational institutions, 112 were from U.S. federal agencies, 27 were from state agencies or zoos, 3 were from industry and 1 was from a foreign veterinary agency. A program for the meeting may be viewed at the following web site: <http://www.nadc.ars.usda.gov/events/wilddom/index.asp>.

**PUBLICATIONS (not previously reported):** 2003/07 TO 2003/09

No publications reported this period.

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**ACCESSION NO :** 0407026 **SUBFILE:** CRIS  
**PROJ NO:** 3625-32000-071-01G **AGENCY:** ARS 3625  
**PROJ TYPE:** USDA CONTRACT **PROJ STATUS:** NEW  
**START:** 07 JUL 2003 **TERM:** 31 DEC 2003 **FY:** 2003

**INVESTIGATOR:** Lager K M; Roth J A

**PERFORMING INSTITUTION:**

College Of Veterinary Medicine  
Iowa State University  
Ames, Iowa 50011

## INTERNATIONAL CONFERENCE ON EMERGING ZOOSES

**OBJECTIVES:** Support for an international meeting entitled "4th International Conference on Emerging Zoonoses," September 18-21, 2003, held by the Institute for International Cooperation in Animal Biologics (IICAB), at Iowa State University in Ames, Iowa. The objective of this meeting is to present research and gather information on the transmission, impact, diagnosis, and control of emerging zoonotic diseases: West Nile virus, Borna disease, rabies, hantavirus, Ebola, Nipah, Hepatitis E, BSE/vCJD, trypanosomiasis, cryptosporidiosis, Salmonella, E. coli 0157:H7, tuberculosis, lyme disease, plague, tularemia, and others.

**APPROACH:** Abstracts of the presentations that will be given during the meeting will be published in the Conference Proceedings. This information will also be placed on a web site at ISU/NADC. This will enable scientists and government officials to have access to the important information that will be presented. International representatives from the veterinary vaccine industry, government agencies, veterinary colleges, producer groups, and industry associations are expected to attend the meeting. The organizing committee is anticipating an attendance of 200 scientists.

### **PROGRESS:** 2003/07 TO 2003/12

4. What were the most significant accomplishments this past year? D. Progress Report: This report serves to document the preparation for the meeting "4th International Conference on Emerging Zoonoses" to be held in Ames, Iowa on September 18-21, 2003. Additional details of research can be found in the report for the parent project 3625-32000-071-00D, Emerging Viral Diseases of Swine. The objective of this meeting is to present research and gather information on the transmission, impact, diagnosis, and control of emerging zoonotic diseases. The abstracts will be published in a conference proceedings and will be placed on an Iowa State University/National Animal Disease Center (USDA-ARS-National Animal Disease Center (NADC), Ames, IA,) website providing this information for public viewing.

### **PUBLICATIONS (not previously reported):** 2003/07 TO 2003/12

No publications reported this period.

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**ACCESSION NO:** 0411438 **SUBFILE:** CRIS

**PROJ NO:** 3625-32000-082-00D **AGENCY:** ARS 3625

**PROJ TYPE:** USDA INHOUSE **PROJ STATUS:** NEW

**START:** 27 OCT 2006 **TERM:** 26 OCT 2011

**INVESTIGATOR:** Waters W R; Palmer M V; Thacker T C

### **PERFORMING INSTITUTION:**

Agricultural Research Service  
Ames, Iowa 50010

## **COUNTERMEASURES TO PREVENT AND CONTROL TUBERCULOSIS IN CATTLE AND WILDLIFE RESERVOIRS**

**OBJECTIVES:** 1) Characterize the immunopathogenesis of *Mycobacterium bovis* infection in domestic livestock and wildlife. 2) Develop and evaluate improved tests for diagnosis of *M. bovis* infection in different animal species. 3) Identify vaccine strategies to elicit protective immunity in cattle and relevant wildlife species.

**APPROACH:** Objective 1 will evaluate tonsillar processing of *M. bovis* and lesion development using a combination of invitro and in vivo methods and both non-infected and experimentally infected cattle and deer. Objective 2 will utilize blood samples from both naturally and experimentally infected cattle and deer to evaluate test sensitivity as well as normal cattle and deer to evaluate test specificity. Vaccine trials in Objective 3 will be limited to efficacy studies utilizing experimentally infected animals and a combination of quantitative and semi-quantitative analysis to evaluate vaccine efficacy. BSL-2/BSL-2N; Recertified May 11, 2006. IBC #0278 BSL-Exempt; Recertified June 8, 2006. IBC #0269 BSL-2/BSL-2N; Recertified May 14, 2006. IBC#0264. BSL-Exempt; (IBC-#0283) 01/12/06. BSL-2/BSL-

1N/BSL-3N; Certified June 1, 2006. IBC#0285. BSL-Exempt; Certified November 8, 2006. IBC #0288. BSL-Exempt; Recertified January 12, 2007. IBC #0284.

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**ACCESSION NO:** 0405543 **SUBFILE:** CRIS  
**PROJ NO:** 3625-32000-082-01R **AGENCY:** ARS 3625  
**PROJ TYPE:** USDA INHOUSE **PROJ STATUS:** NEW  
**START:** 01 FEB 2002 **TERM:** 31 JAN 2007 **FY:** 2006

**INVESTIGATOR:** Whipple D L; Waters W R; Palmer M V

**PERFORMING INSTITUTION:**

Agricultural Research Service  
Ames, Iowa 50010

**DIAGNOSIS AND PATHOGENESIS OF TUBERCULOSIS IN ANIMALS**

**OBJECTIVES:** Evaluate immune responses of reindeer sensitized to *Mycobacterium bovis* BCG; Evaluate immune responses and diagnostic tests in reindeer experimentally infected with pathogenic *M. bovis*; Evaluate lesions in reindeer experimentally infected with *M. bovis*; and Evaluate immune responses and lesion development in white-tailed deer experimentally infected with *M. bovis*.

**APPROACH:** A group of reindeer will be sensitized with *M. bovis* BCG and matched with a group of non-sensitized control animals. Blood samples will be collected and skin tests will be conducted periodically throughout the study period. Various immune function assays will be conducted to monitor immune responses. In the second study, reindeer will be challenged with virulent *M. bovis*. Blood samples will be collected and skin tests will be conducted similar to the first study. In addition, tissue samples will be collected at various times to characterize the progression of disease in reindeer. White-tailed deer will be experimentally challenged with *M. bovis* using two routes of inoculation and three dosages. Immune responses will be monitored by evaluating blood collected at various times and conducting skin tests. Lesions will be characterized at the conclusion of the study. BSL-1-3-N; Certified through October 15, 2004.

**PROGRESS:** 2005/10 TO 2006/09

Progress Report 4d Progress report. This report serves to document research conducted under a reimbursable agreement between ARS and USDA-Animal and Plant Health Inspection Service (APHIS)- Veterinary Services (3625-32000-063-01R, Diagnosis and pathogenesis of tuberculosis in animals. Additional details of research can be found in the report for the parent project 3625-32000-063-00D Diagnosis and control of tuberculosis in livestock and wildlife. Cattle, as well as bison, and all species of Cervidae are subject to testing for tuberculosis under the guidelines of the USDA uniform rules and methods for the eradication of bovine tuberculosis. The most common means of testing is the tuberculin skin test. Tuberculin skin testing lacks specificity in deer and cattle and has not been fully validated in all species of deer. Research on modifications to existing blood based tests for cattle such as the Bovigam are being conducted to improve test specificity. In FY06 ARS began a field study in collaboration with USDA/APHIS to evaluate the specificity of a modified version of the Bovigam in Michigan, USA. Results of the study are being collected and will be evaluated. Preliminary results suggest that modifications can improve test specificity, thus decreasing the number of false positive test results, decreasing the number of cattle euthanized unnecessarily, and decreasing costs to cattle producers and USDA.

**PUBLICATIONS (not previously reported):** 2005/10 TO 2006/09

No publications reported this period.

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**ACCESSION NO:** 0083779 **SUBFILE:** CRIS  
**PROJ NO:** IOWV-400-23-09 **AGENCY:** CSVN IOWV  
**PROJ TYPE:** STATE **PROJ STATUS:** EXTENDED  
**START:** 01 AUG 1980 **TERM:** 17 SEP 2007 **FY:** 2006

**INVESTIGATOR:** Thoen, C. O.

**PERFORMING INSTITUTION:**

Veterinary Medicine  
Iowa State University  
Ames, Iowa 50011

**MYCOBACTERIAL INFECTIONS IN ANIMALS**

**OBJECTIVES:** Characterization of mycobacterial isolates from domestic and exotic animals.

**APPROACH:** In vitro investigations will include biochemical and drug susceptibility tests; ELISA will be conducted to select humoral antibodies in experimentally or naturally infected animals.

**PROGRESS:** 2003/01 TO 2003/12

Mycobacteriologic examinations were conducted on tissues and fecal specimens submitted from 497 animals. *Mycobacterium avium* ss *paratuberculosis* was isolated from 35 (7%) of the specimens. *M. avium* ss *avium* was isolated from 8 specimens. Rapidly growing nonphotochromogenic mycobacteria were isolated from 11 specimens. *M. tuberculosis* was isolated from 2 specimens.

**IMPACT:** 2003/01 TO 2003/12

The isolation of *M. avium* ss *paratuberculosis* is in support of research to develop improved diagnostic tests for Johne's disease in cattle. The disease is widespread in dairy herds in Iowa and causes significant economic losses to producers.

**PUBLICATIONS (not previously reported):** 2003/01 TO 2003/12

No publications reported this period

**PROJECT CONTACT:**

Name: Thoen, C. O.  
Phone: 515-294-7608  
Fax: 515-294-8500  
Email: cthoen@iastate.edu

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**ACCESSION NO:** 0205410 **SUBFILE:** CRIS  
**PROJ NO:** LAB03774 **AGENCY:** SAES LA.B  
**PROJ TYPE:** STATE **PROJ STATUS:** NEW  
**START:** 01 OCT 2005 **TERM:** 30 SEP 2010 **FY:** 2006

**INVESTIGATOR:** Elzer, P.; Sanders, D.; Enright, F.; French, D.; Bastian, F.

**PERFORMING INSTITUTION:**

Veterinary Science  
Louisiana State University  
Baton Rouge, Louisiana 70893

**INVESTIGATION OF EMERGING INFECTIOUS DISEASES IN SMALL RUMINANTS, INCLUDING WHITE-TAILED DEER**

**NON-TECHNICAL SUMMARY:** In order to reach valid statistical conclusions with adequate numbers, the cost of large animal research is prohibitive. The characterization of a small ruminant model to evaluate the pathogenesis of and immune response to various infectious agents and the development of potential vaccine candidates for these pathogens will benefit animal researchers and producers.

**OBJECTIVES:** To expand the established brucellosis small ruminant model system to study emerging infectious

diseases of domestic livestock and wildlife. This small ruminant model system has been tested using three important regulatory diseases of cattle: brucellosis, tuberculosis and Johne's disease. Two of these diseases are caused by zoonotic bacterial pathogens, one of which is classified as a biological terrorism agent. The goal of this project is to expand the capacity of the model system to look at Transmissible Spongiform Encephalopathies (TSE) and other future regulatory/emerging pathogenic diseases of domestic livestock and/or wildlife species.

**APPROACH:** In this phase of the project, we plan to inoculate neonatal goats, sheep, and white-tailed deer with *Spiroplasma* in an attempt to induce TSE. Neonates will be used due to their probable increased susceptibility and reduced incubation period. Inoculation will be accomplished via intracranial injection in the right hemisphere between the fontanelles using a 21-gauge needle. Groups of animals will be experimentally inoculated with bacteria and equal numbers will be injected with media to serve as controls. Animals will be euthanatized upon onset of clinical signs or at the termination of the study if no signs develop. Control animals will be sacrificed concurrently with experimental animals. For acute studies animals will be sacrificed monthly to monitor changes in brain pathology prior to manifestation of clinical signs.

**PROGRESS:** 2006/01 TO 2006/12

Neonatal goats and sheep were inoculated via intracranial injections in the right hemisphere between the fontanelles using a 21-gauge needle with *Spiroplasma* in an attempt to induce Transmissible Spongiform Encephalopathies (TSE). Control groups received injections of media. Animals were euthanatized one year post inoculation since no clinical signs developed. Upon necropsy, numerous histological lesions similar to TSE like lesions were observed in the brains of the *Spiroplasma* injected animals compared to none in the control animals. White tailed-deer have currently been injected with *Spiroplasma* in an attempt to induce TSE like symptoms and or lesions.

**IMPACT:** 2006/01 TO 2006/12

The goal of this project is to expand the capacity of the model system to look at TSE and other future regulatory/emerging pathogenic diseases of domestic livestock and/or wildlife species. The results of this project will lead to the development of a ruminant model and diagnostic tests to assist in the control and or eradication of these diseases.

**PUBLICATIONS (not previously reported):** 2006/01 TO 2006/12

No publications reported this period

**PROJECT CONTACT:**

Name: Elzer, P. H.

Phone: 225-578-4763

Fax: 225-578-4890

Email: pelzer@agcenter.lsu.edu

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**ACCESSION NO:** 0189284 **SUBFILE:** CRIS

**PROJ NO:** LAB93527 **AGENCY:** CSREES LA.B

**PROJ TYPE:** ANIMAL HEALTH **PROJ STATUS:** TERMINATED

**START:** 01 MAY 2001 **TERM:** 30 OCT 2006 **FY:** 2006

**INVESTIGATOR:** Elzer, P. H.

**PERFORMING INSTITUTION:**

Veterinary Science

Louisiana State University

Baton Rouge, Louisiana 70893

**EVALUATION OF B. ABORTUS RB51 AS A MULTIVALENT VACCINE TO GENERATE IMMUNE RESPONSES AGAINST BRUCELLOSIS, TUBERCULOSIS AND JOHNE'S IN CATTLE.**

**NON-TECHNICAL SUMMARY :** Brucellosis, Tuberculosis and Johne's Disease are three major bacterial diseases

which have a negative impact on the cattle industry in the United States. The long term goal of our research program is to develop a recombinant RB51 strain that would function as a highly efficacious live multivalent vaccine against three important chronic intracellular bacterial diseases: brucellosis, tuberculosis (Tb), and paratuberculosis (Johne's).

**OBJECTIVES:** 1. Determine the localization and number (colony forming units CFU) of *Brucella abortus* RB51 constructs expressing *Mycobacterium bovis* and *M. avium paratuberculosis* antigens in the lymphoid tissues of *Brucella*, *Mycobacterium* naïve, sexually mature, female cattle at 7, 14, 21, 28 and 42 days post inoculation. 2. Determine the localization of selected rough *B. abortus* mutants expressing the mycobacterial antigens and their pathogenic potential when administered to late gestational cattle.

**APPROACH:** Sixty beef cattle, which are not vaccinated for brucellosis and tuberculosis negative, will be used in this study and will be divided into 6 groups. 1. Strain RB51 overexpressing SOD and expressing the 85A antigen from *M. bovis* BCG (strain RB51SOD/85A) 2. Strain RB51 overexpressing SOD and expressing the 35 kDa antigen from *M. paratuberculosis* (strain RB51SOD/35) 3. Strain RB51 overexpressing SOD and expressing the ESAT6 antigen from wild type *M. bovis* (strain RB51SOD/ESAT6) 4. Strain RB51 overexpressing SOD and expressing the three antigens, ESAT-6, 85A, and 35 kDa antigen (strain RB51SOD/3xAG) 5. RB51 overexpressing SOD (vector control) 6. Saline (negative control) All animals will receive intramuscularly (im)  $1-3 \times 10^{10}$  CFU of RB51 expressing the different antigens. At 7, 14, 21, 28, and 42 days post-vaccination, 2 animals from each group will be sacrificed using a captive bolt. Forty-eight hours prior to necropsy, skin tests will be performed using *Brucella* and Tb antigens. The animals will then be necropsied, and sera and tissues will be removed for the culturing of *Brucella* and for histology. The skin test site and a small section of each tissue will be removed and placed in 10% buffered formalin for histology. The remaining tissues will be individually homogenized and plated on *Brucella*-selective media. After 3 to 14 days of incubation at 37C in 5% CO<sub>2</sub>, the plates will be counted; and selective isolates will be tested using molecular techniques to make sure the mutant strains have not changed. Fixed tissues will be stained using H&E and morphological changes will be recorded compared to control tissues. Prevacination and necropsy serum samples will be tested using standard brucellosis diagnostic tests (all which should remain negative), Western blot analysis, and ELISA. Thirty sexually mature beef cattle, which are not vaccinated for brucellosis and tuberculosis negative, will be used in this study and will be divided into 6 groups. The animals will be bred, and pregnancies will be time-dated. At 200 days pregnancy, 5 animals from each experimental group will be injected intramuscularly with  $1-3 \times 10^{10}$  cfu of the different RB51 strains and 5 animals will be infected conjunctivally with  $1 \times 10^7$  cfu of the virulent field strain 2308. Pregnancies will be monitored; and abortions, premature or live births will be recorded. At the time of birth or abortion, the fetus, fetal membranes, and maternal membranes will be collected. A portion of the fetal and maternal membranes will be taken and placed in 10% buffered formalin and the remainder will be cultured. The following tissues will be taken for histology and *Brucella* culture from the fetus: lungs, liver, spleen, adrenal glands, thymus, internal iliac ln, and blood. The cows will be sacrificed and necropsied as described in Specific Aim 1. Histological and immunological analyses will also be performed as described above.

**PROGRESS:** 2001/05 TO 2006/10

Vaccinating animals against brucellosis, specifically cattle and swine, with a vaccine that is safe and efficacious, aids in the protection of domestic and wild animals from this zoonotic or potential agroterrorist pathogen. Rough *Brucella abortus* vaccine derivatives of strain RB51 were used to express heterologous antigen preparations from *Mycobacterium bovis* (MB), *M. avium paratuberculosis* (MAP) and Pseudorabies virus (PRV). Cattle vaccinated with RB51 expressing MB or MAP antigens generated the appropriate cell mediated and or humoral responses to the antigens. These vaccines provided significant protection against virulent brucellae challenge. When RB51-MB vaccinated cattle were challenged with MB, significant protection was observed with the vaccine strain expressing Esat-6 of MB. These results were also confirmed with histological observations. Swine vaccinated with RB51-PRV or a rough strain of *B. suis* expressing PRV antigens (VTRS-PRV) generated humoral immune responses to the PRV antigen, and both vaccines provided significant protection against virulent brucellae challenge in swine. When used in pregnant animals, none of the above vaccines induced abortions or any negligible gross pathological lesions. Vaccination with RB51 expressing antigens from other facultative intracellular pathogens provides protective immunity against both homologous and heterologous organisms. A dual purpose vaccine will be of benefit to producers in areas where the above mentioned diseases pose a risk of transmission to traditional livestock populations from feral or wild animals.

**IMPACT: 2001/05 TO 2006/10**

A disease-free food animal population is imperative to the well-being of all individuals. The regulatory disease addressed in this study deleteriously impacts the economics of cattle and swine producers, directly affecting the market price and interstate and international import/export potential of the animals, which in turn influences all consumers. As zoonotic organisms, *Brucella* species pose a human health threat, hence a protected animal population benefits the general public. Brucellosis animal vaccine work has a significant impact in protecting the human population since *Brucella* species are also known as bioterrorist agents or "agents of mass destruction."

**PUBLICATIONS (not previously reported): 2001/05 TO 2006/10**

1. Nielsen, K, P. Smith, W. Yu, P. Nicoletti, P.H. Elzer, C. Robles, R. Bermudez, T. Renteria, A. Ruiz, C. Massengill, Q. Muenks, G. Jurgensen, T. Tollersrud, L. Samartino, S. Conde, L. Forbes, D.Gall, B. Perez, X. Rojas, and A. Minos (2005). Towards a single screening test for brucellosis. Res. Sci. Off. Int. Epiz 24(3):1027-1038.
2. Zygmunt, M.S., S.D. Hagius, J.V. Walker, and P.H. Elzer. (2006). Signature tagged mutagenesis identification of *Brucella melitensis* 16M genes required for bacterial survival in the caprine host. Microbes Infect. 2006 Oct 16; [Epub ahead of print]
3. Roux, C.M., N.J. Booth, B.H. Bellaire, J.M. Gee, R.M. Roop, M.E. Kovach, R.M. Tsolis, P.H. Elzer, and D.G. Ennis. (2006). RecA and RadA proteins of *Brucella abortus* do not perform overlapping protective DNA repair functions following oxidative burst. J. Bacteriology, 188(14):5187-95.
4. Kahl-McDonagh, M.M., P.H. Elzer, S.D. Hagius, J.V. Walker, Q.L. Perry, C.M. Seabury, R.M. Tsolis, L.G. Adams, D.S. Davis and T. Ficht. Evaluation of novel *Brucella melitensis* unmarked deletion mutants for safety and efficacy in the goat model of brucellosis. (2006) Vaccine. Jun 12;24(24):5169-77.

**PROJECT CONTACT:**

Name: Elzer, P. H.  
Phone: 225-578-4763  
Fax: 225-578-4890  
Email: pelzer@agctr.lsu.edu

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**ACCESSION NO:** 0209503 **SUBFILE:** CRIS

**PROJ NO:** LAB93841 **AGENCY:** CSREES LA.B

**PROJ TYPE:** ANIMAL HEALTH **PROJ STATUS:** NEW

**START:** 01 NOV 2006 **TERM:** 31 OCT 2011

**INVESTIGATOR:** Elzer, P. H.; French, D. D.

**PERFORMING INSTITUTION:**

Veterinary Science  
Louisiana State University  
Baton Rouge, Louisiana 70893

**EVALUATION OF B. ABORTUS RB51 AND B. SUI S VTRS1 AS MULTIVALENT VACCINES TO GENERATE IMMUNE RESPONSES AGAINST BRUCELLOSIS, TUBERCULOSIS AND P [ title incomplete from database]**

**NON-TECHNICAL SUMMARY:** The eradication of bovine and swine brucellosis and tuberculosis from cattle and pigs within the United States remains a major goal of the USDA. Although eradication is essentially complete, isolated pockets of disease continue to plague both programs. The long term goal of our research program is to develop recombinant sp. strains that would function as highly efficacious live multivalent vaccines against three important chronic intracellular diseases: brucellosis, tuberculosis, and pseudorabies.

**OBJECTIVES:** The long term goal of our research program is to develop recombinant *Brucella* sp. strains that would function as highly efficacious live multivalent vaccines against three important chronic intracellular diseases: brucellosis, tuberculosis, and pseudorabies.

**APPROACH:** 1. Determine the localization and number of colony forming units (cfu) of *Brucella abortus* and *B. suis* VTRS1 constructs in the lymphoid tissues of *Brucella*, *Mycobacterium*-naive, sexually mature female cattle and swine at 7, 14, 21, 28 and 42 days post-inoculation. 2. Determine the localization of selected rough *B. abortus* and *B. suis* mutants expressing brucella, mycobacterial or pseudorabies antigens and their pathogenic potential when administered to late-gestational cattle or swine. 3. Determine the vaccine efficacy of rough *B. abortus* and *B. suis* mutants in pregnant swine against virulent *B. suis* challenge.

**PROJECT CONTACT:**

Name: Elzer, P. H.

Phone: 225-578-4763

Fax: 225-578-4890

Email: pelzer@agcenter.lsu.edu

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**ACCESSION NO:** 0194591 **SUBFILE:** CRIS

**PROJ NO:** MICL02050 **AGENCY:** CSREES MICL

**PROJ TYPE:** HATCH **PROJ STATUS:** TERMINATED

**START:** 01 NOV 2002 **TERM:** 31 DEC 2004 **FY:** 2005

**INVESTIGATOR:** Woods, M. D.; Beckwith, J.

**PERFORMING INSTITUTION:**

Dept. of Community, Agriculture, Recreation & Resource Studies

Michigan State University

East Lansing, Michigan 48824

**THE IMPACT OF COMMUNICATING ANR RISKS ON STAKEHOLDER PARTICIPATION AND PUBLIC POLICY**

**NON-TECHNICAL SUMMARY:** As public perceptions and concerns within Michigan towards ANR risks continue to increase, so has the need to expand research on the impact of communicating ANR risks on stakeholder participation and public policy. This project investigates the proposition that wider stakeholder participation in Michigan ANR risk issues will be beneficial to building both trust relationships and public understanding, while mapping possible unintended consequences of public participation.

**OBJECTIVES:** ANR risk communication and perception research is a complex and often controversial activity that is both a product of analysis and dependent on the processes of defining and conducting analysis. This MAES umbrella research project will assess opportunities to improve the communication of risk to better inform decision-making and enhance the resolution of controversies over risk in Michigan ANR industries. The project will address: 1) technical issues such as the representation of uncertainty; 2) issues relating to translating the outputs of conventional risk analysis into non-technical language; and 3) the impact of communicating ANR risks on stakeholder participation and public policy. Specifically, the long-term goal of this research project is to contribute knowledge of risk communication and perception in a way that is genuinely interdisciplinary and attains theoretical integration across several levels of analysis. A key concern will be to understand the logic and dynamics of risk and trust and how stakeholder participation relates to: institutional behavior, public policy, the social and cultural networks that people inhabit, and new forms of risk communication. The objective of this project is to investigate the proposition that wider stakeholder participation in Michigan ANR risk issues will be beneficial to building both trust relationships and public understanding, while mapping possible unintended consequences of public participation. Specifically four projects over a five-year period will be conducted, each addressing a distinct set of issues (see objective section for specific aims of each project). At the core of the research proposal (Project A) will be a set of major in-depth empirical investigations of public perceptions of key biological, behavioral, and societal risk issues in Michigan (i.e. land use, bovine tuberculosis, food safety, etc.). The data from these core cases will be used to inform parallel projects on institutional handling of risk (Project B) on public expectations, risk communication and new institutional forms (Project C) and on stakeholder involvement in public policy decision making (Project D).

**APPROACH:** For this project, the researcher will examine the research objectives and specific aims through Q modeling. Q is a technique for studying human subjectivity. Every person perceives the world differently, and Q uses these subjective viewpoints to construct typologies of different perspectives. Moreover, through the use of Q methodology, the PI will be allowed the opportunity to blend both quantitative and qualitative methods in order to gain both the breadth and depth of the population's perspectives towards ANR risks. Q is different from typical correlation methodology. Correlation statistics with which most researchers are familiar are the main types of statistical techniques used to measure inter-individual differences. Q, in contrast, excels at measuring intra-individual differences or subjectivity, but not at the expense of group comparison. The PI sees the uniqueness of Q as its power to blend knowledge created through qualitative analysis and quantitative analysis. Q, as the PI intends to use it, would begin with a qualitative or interpretive phase, then cycle into a quantitative phase. After statistical analysis, the PI will then cycle into another interpretive phase. Theoretically, Q differs fundamentally from correlation methodology. In contrast to R, Q measures an individual's conceptualization of an issue from his or her point of view rather than the subjective interpretation of a construct as defined by a researcher. It may seem counter-intuitive that subjective statements can be administered in an objective fashion to people, each assumed to possess a unique worldview. However, one key to the subjectivity/objectivity dilemma lies in the origin and treatment of the statements themselves. The Q statements are placed by people in order of agreement in relation to one another. The result is a scale that is anchored in the respondent's own subjective reality as opposed to one that is constructed and anchored for the respondent by the researcher. One of the basic tenets of Q lies in the treatment of individuals as variables and conceptualizations as traits. The individuals are then factor-analyzed.

**PROGRESS:** 2002/11 TO 2004/12

This project helps build understanding of ways to engage citizens in dialogue about possible policy directions when risk is uncertain. This project used a National Issues Forum style of deliberation to engage citizens in small-group dialogue meetings about cleanup choices for a hazardous contamination problem in mid-Michigan. Citizens who participated live in the area affected by dioxin contamination in the Tittabawassee River sediment and floodplain soils. The research is significant to understanding how citizens who are not affiliated with activist or other stakeholder groups engage in an issue that affects them. It provides citizens with educational support on the topic, facilitated discussion groups, and surveys their knowledge and opinions before and after the forum. Progress this year included the development of an Issue Guide that was used by forum participants. This guide was the result of researcher investigation of the topic and stakeholder interviews. Forum participants were recruited by door-to-door efforts that surveyed citizens and screened those ineligible due to an affiliation. Nine forums were conducted in July and August of 2004. Surveys were repeated 30-days after the forum to determine stability of attitudes and opinions. The data are qualitative and analysis is underway. It is too soon to report results.

**IMPACT:** 2002/11 TO 2004/12

Expected impacts from the funded project associated with my Experiment Station project include: 1.The proposed methodology will measure citizen preference with respect to choices and trade-offs associated with a specific site remediation 2.The proposed methodology will utilize local citizen knowledge. 3.A key component of the proposed project is a methodology for evaluating the effectiveness of the public issues forums. 4.Another key component of the methodology is the preparation of unbiased and accurate background documents that are written in a manner appropriate for ordinary citizens to engage in deliberative discourse on policy choices associated with the environmental cleanup in their community. 5.An output of the study will be an outreach tool that could be used by the EPA and others to conduct similar public involvement exercises in other communities with environmental cleanups.

**PUBLICATIONS (not previously reported):** 2002/11 TO 2004/12

1.United State Environmental Protection Agency, & Michigan State University 2004. Dioxin Contamination and the Tittabawassee River and Floodplain. Managing the Risks: An Issue Guide.

**PROJECT CONTACT:**

Name: Woods, M. D.

Phone: 517-355-6580

Fax: 517-353-4981

Email: mwoods@msu.edu

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**ACCESSION NO:** 0181070 **SUBFILE:** CRIS  
**PROJ NO:** MICL06891 **AGENCY:** CSREES MICL  
**PROJ TYPE:** ANIMAL HEALTH **PROJ STATUS:** TERMINATED  
**START:** 01 OCT 1998 **TERM:** 30 SEP 2003 **FY:** 2003

**INVESTIGATOR:** Scribner, K.

**PERFORMING INSTITUTION:**

Fisheries and Wildlife  
Michigan State University  
East Lansing, Michigan 48824

**PREDICTIVE GENEALOGICAL MODEL FOR TRANSMISSION OF TUBERCULOSIS IN FREE-RANGING MICHIGAN DEER**

**OBJECTIVES:** The long-term goals are to use molecular genetic techniques, detailed data on animal ecology and movement patterns, and spatial statistical methods to provide critical data which would elucidate the mechanism(s) of transmission of Bovine Tuberculosis in free-ranging white-tailed deer in Michigan and to aid in elimination. The general objectives are to characterize the extent of spatial genetic structuring and degree of genetic relatedness among deer from areas of high and low TB prevalence. Estimate of inter-individual relatedness will be examined as a potential predictor of incidence of TB infection.

**APPROACH:** Subsamples of the entire white-tailed deer hunt in NE Michigan will be selected for genetic analysis. All deer which have been tested positive for TB will be genotyped. Uninfected deer will be chosen to provide samples of comparable geographic dispersion as the TB+ deer. Each deer will be genotyped for each of 15-20 polymorphic microsatellite loci. Estimate of the degree of genetic similarity among individuals will be quantified using the coefficient of relationship, which is based on the number of alleles individuals share. This analysis will explicitly test whether co-infection is significantly correlated to geographic proximity and to genealogical relationship (and inferentially kinship).

**PROGRESS:** 1998/10 TO 2003/09

Zoonoses are of increasing importance to wildlife conservation and human health. Ecological attributes of wildlife species are increasingly recognized as playing a key role in disease transmission in natural populations. In domestic populations, contacts among individuals are controlled by humans and disease transmission is often density dependent. Unlike domestic animals, natural wildlife populations often have complex social systems that can play an important role in the transmission and maintenance of disease in a density-independent manner. White-tailed deer (*Odocoileus virginianus*) in the northeast lower peninsula of Michigan (MI) are infected with bovine tuberculosis (*Mycobacterium bovis*) (TB). Wide-spread use of artificial feeding brought large numbers of deer into contact and likely facilitated the transmission of TB. White-tailed deer ecology may also play an important role in the probability of infection with TB. Deer have a complex social system in which females live in related groups (matrilines). The rate of contact among individuals within matrilines is high relative to contact rates among individuals from different matrilines. Estimates of genealogical relationships were used to infer the role that white-tailed deer social structure played in the risk of TB infection. TB-infected deer were significantly more closely related than were non-infected deer, suggesting that matrilines serve as reservoirs of TB within free-ranging deer populations. White-tailed deer matrilineal social structure would be expected to result in spatial heterogeneity in allele frequencies. Artificial feeding of deer in MI, however, resulted in the congregation of large numbers of individuals, potentially from large areas, at artificial feeding sites. Molecular markers were used to characterize the impact of artificial feeding on deer spatial genetic structure in the northeast lower peninsula of MI. Spatial autocorrelation analyses revealed that when artificial feeding occurred, no significant relationship between degree of genetic differentiation and geographic distance was observed. The aggregation of multiple matrilines at feeding sites likely homogenized spatial genetic structure. Following the ban on artificial feeding, there was significant heterogeneity in allele frequencies among groups of deer as a function of genetic distance. The significant microgeographic genetic structure that exists within the deer population following the ban on artificial feeding indicates that transmission of TB across genetically differentiated groups is likely to be limited.

**IMPACT:** 1998/10 TO 2003/09

Results of this study have been widely cited across the country. Information is being used by federal and state agencies to develop better predictive capabilities in areas of disease prevalence and distribution.

**PUBLICATIONS (not previously reported):** 1998/10 TO 2003/09 Blanchong, J.A. 2003. Genealogical relationships influence the probability of infection with bovine tuberculosis and microgeographic genetic structure in free-ranging white-tailed deer. PhD dissertation, Michigan State University, 102pp.

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**ACCESSION NO:** 0188199 **SUBFILE:** CRIS

**PROJ NO:** MICL07664 **AGENCY:** CSREES MICL

**PROJ TYPE:** SPECIAL GRANT **PROJ STATUS:** TERMINATED

**CONTRACT/GRANT/AGREEMENT NO:** 2001-34427-10444 **PROPOSAL NO:** 2001-03570

**START:** 01 JUL 2001 **TERM:** 30 JUN 2004 **FY:** 2004 **GRANT YR:** 2001

**GRANT AMT:** \$303,339

**INVESTIGATOR:** Kaneene, J. B.; Fitzgerald, S. D.; Bartlett, P. C.; Griffore, F.;  
Bolin, S.; Bolin, C.

**PERFORMING INSTITUTION:**

Population Medicine Center  
Michigan State Univ  
East Lansing, Michigan 48824

**EPIDEMIOLOGY AND RISK ANALYSIS OF MYCOBACTERIUM BOVIS IN WILD AND DOMESTIC ANIMALS IN MICHIGAN**

**NON-TECHNICAL SUMMARY:** Bovine tuberculosis (TB) in Michigan is being recognized as more prevalent in wildlife and livestock than originally thought. We have seen bovine TB in beef and dairy cattle and in a number of wildlife species. The current combination of active and passive surveillance programs, as well as control and eradication efforts, have shown that more research is needed to provide information needed to deal with the problem. The first focus of these projects is to identify factors that will influence whether a cattle herd will develop TB. Next, these projects will look at the effectiveness of tests used to detect TB in cattle. Finally, the projects will look at the impact of bovine TB on farm families and communities in the TB-affected area.

**OBJECTIVES:** Specific objectives are to: 1) conduct epidemiological studies to determine major risk factors influencing TB transmission in livestock and deer, 2) refine and validate preliminary risk analysis models, 3) evaluate the effect of *M. paratuberculosis* status on the reliability of the CFT in cattle, 4) use new risk analysis approaches to estimate the rate of false positives on the CFT and CCT, 5) determine whether wild rodents are possible TB reservoirs, and 6) determine the social impact of bovine TB on farm families and farm communities.

**APPROACH:** Objective 1: A retrospective epidemiological study will examine the association between *M. bovis* infection and physical landscape factors. Environmental samples will be taken from livestock operations with confirmed *M. bovis* infections and processed for bacterial isolation, identification, and typing. A cross-sectional study will identify different wildlife species with bovine TB, determine the most likely routes of infection for each species, and estimate the potential of each species to be hosts for *M. bovis* by describing pathogenicity and assessing the possibility of shedding through different routes. A retrospective epidemiological analysis will be conducted to examine the association between the occurrence of *M. bovis* on farms with *M. bovis* in deer, deer-related supplemental feeding, and physical landscape factors. Objective 2: A stochastic simulation model, using cattle herd factors, deer factors, deer feeding factors, and land use factors, will be developed to estimate the risk of a dairy or beef cattle herd developing TB infection in a year. Objective 3: From dairy herds in the Michigan Johne's Control Program, three herds will be selected: one high prevalence herd (> 15%); one low prevalence herd (< 2%); and one Johne's-free herd. Each animal will receive a bovine TB caudal fold test, comparative cervical test, and gamma-interferon tests, and TB test results will be compared by Johne's disease status. Objective 4: A database and data entry template for infected Michigan cattle herds will be developed for CFT and CCT data. Risk analysis software will be used to generate frequency distributions

of tuberculosis prevalence in different sub-populations of domestic ruminants. Risk analysis software will be used to generate frequency distributions of rates of false positives and negatives, and true positives and negatives, from the Michigan TB testing program for livestock. Objective 5: *M. bovis* of deer-origin from Michigan will be used to inoculate prairie voles by oral gavage and intranasal installation. Groups of oral-inoculated, nasal-inoculated, and control rodents will be euthanized at days 30 and 60 post-inoculation. Necropsies, histopathology, acid-fast staining and mycobacterial isolation will be evaluated for rodent susceptibility to infection with *M. bovis* and ability to shed the organism. Objective 6: Followup interviews with farm families affected by bovine TB in northeastern Michigan will be conducted to examine patterns of adaptive behavior and long-term impact of bovine TB on farm families. Families with new TB herds, and farmers in the area who have not yet been directly affected by TB will be interviewed. Interviews have been conducted with members of various stakeholder groups, and a subset of these interviewees will be contacted to aid in clarification of the results. A public opinion survey will collect attitudes about the Michigan TB situation from key personnel in state-level agricultural and natural resource agencies across the US. Data collected by the questionnaire will be evaluated to assess respondents' reactions to the TB situation and areas where additional information or education are needed.

#### **PROGRESS: 2001/07 TO 2004/06**

The first aim of this project was to determine the spatial relationships of bovine TB (bTB) in white-tailed deer, relating to factors in the physical landscape and location-specific human activity. Spatial clusters of TB were detected in areas that encourage deer to congregate for long periods of time. One paper has been submitted for publication. To identify factors that may influence whether a cattle herd will develop TB, a matched case-control study of herds was conducted to identify herd management factors and environmental conditions associated with TB (Kaneene et al., 2002). A stochastic risk assessment model for herd TB status was developed, based on results of this study, and has been integrated with economic data to create a management tool to develop recommendations to reduce the TB risk for individual cattle farms. The on-farm program is undergoing field testing. The study on the effect of Johnes disease (JD) on the caudal fold tuberculin test (CFT) in herds without TB was completed and submitted for publication. Fecal culture and antibody ELISA for *M. avium* ssp. *paratuberculosis*, were performed on cattle from 10 herds. Blood samples were taken and subjected to gamma-interferon (GI) tests for *M. bovis* and JD. Cattle positive for JD by fecal culture, ELISA, or GI appear to be more likely to be false + on CFT than were negative cattle, and no associations were found between + fecal culture or ELISA with GI for *M. bovis*. To determine the effectiveness of current TB testing in Michigan cattle, cattle from TB-infected herds were examined by gross necropsy, histopathologic exam, mycobacterial culture, and PCR. Bayesian inference was used to estimate the sensitivity and specificity of the CFT and comparative cervical tuberculin test (CCT) using two-population-two-tests latent-class models. Bayesian estimates of the sensitivity and specificity of the CFT and CCT were 85 and 94%, and 76 and 99%, respectively, which agrees with reports from other studies in the U.S. Two papers have been submitted for publication. To evaluate the role of rodents as possible reservoirs of *M. bovis*, an experimental study was conducted to study the relative susceptibility of 'wild-type' rodents to inoculation with *M. bovis* by the oral and intranasal routes. *M. bovis* was cultured from the feces of 9 oral inoculates and 8 intranasal inoculates on day 1 post-inoculation, and from fecal samples of 3 intranasal inoculates at day 30 post-inoculation, and also from pooled tissue samples. Results of this study are being prepared for publication. In-person interviews were conducted with farm families to measure the social impacts of bTB, and study findings indicate that families can adapt to the changes imposed by the presence of TB on their farms, but they experienced problems in receiving information in a timely fashion, and inconsistency and inequity in the application of government policies and procedures. To lessen negative impacts, families should be accorded more attention and consideration when policies are made, and should have a more substantial role in decision-making as it relates to their own farms. Two manuscripts are being submitted for publication.

#### **IMPACT: 2001/07 TO 2004/06**

Control and eradication of TB from the Michigan livestock industry requires an understanding of the disease and how it spreads, efficient disease detection methods, and the development of tools for control of the disease at the farm level. Risk assessment models can be used to develop sound, cost-effective disease control programs. The reliability of the caudal fold skin test, used for TB testing in livestock, may be affected by an animal's disease or vaccination status. These factors should be taken into consideration when interpreting TB skin test results, or designing a TB surveillance program. Current TB tests require great time, effort and expense, and false results are common with existing skin and blood tests. Even with TB lesions, many times associated with acid-fast bacilli, bacteria cannot be cultured because of poor samples, freeze-thaw, or lack of available fresh tissues. New DNA-based testing methods (cDNA microarray

analysis of gene expression and laser-capture microscopy for isolating DNA for PCR) have the potential to become rapid, sensitive methods to identify TB in tissue samples in an efficient and reliable way. With a better understanding of the stresses and social impacts of bovine TB on Michigan farm families, programs can be designed to reduce the negative impact of TB control and surveillance programs on families' lives.

**PUBLICATIONS (not previously reported):** 2001/07 TO 2004/06

1. Dunn, J.R., Kaneene, J.B., Grooms, D.L., Bolin, S.R., Bolin, C.A., Bruning-Fann, C.S. Testing positive for *Mycobacterium avium* subsp. *paratuberculosis* and the lack of significant effect on the caudal fold tuberculin (CFT) and gamma interferon tests for bovine tuberculosis. Am J Vet Res, accepted for publication 2004.
2. Fitzgerald, S.D., Boland, K.G., Clarke, K.R., Wismer, A., Kaneene, J.B., Berry, D.E., Church, S.V., Hattey, J.A., C.A. Bolin. Experimental Inoculation of Mallard Ducks (*Anas platyrhynchos*) with *Mycobacterium bovis*. Avian Dis. submitted 2004.
3. Griffore, R., Phenice, L. The Impact of Bovine TB on the Farm Family Ecosystem. In preparation for submission to Family Relations, 2004.
4. Griffore, R., Phenice, L.; Kaneene, J.B. Veterinarians: A Complex Role of Mediation Between the State and Farm Families. In preparation for submission to Journal of the American Veterinary Medical Association, 2004.
5. Miller, R., Kaneene, J.B., Schmitt, S.M., Lusch, D.P., Fitzgerald, S.D. Geographic distribution and spatial analysis of *Mycobacterium bovis* infection in white-tailed deer (*Odocoileus virginianus*) in Michigan. Prev Vet Med. accepted 2004.
6. Norby, B., Bartlett, P.C., Fitzgerald, S.D., Granger, L., Bruning-Fann, C., Whipple, D.L., J.B. Payeur. The Sensitivity of Gross Necropsy, Caudal Fold and Comparative Cervical Tests for the Diagnosis of Bovine Tuberculosis. J Vet Diagn Invest. 16:126-131, 2004.
7. Norby, B., Bartlett, P.C., Grooms, D.L., Kaneene, J.B., Bruning-Fann, C.S. Herd-level sensitivity, specificity, and predictive values of bovine tuberculosis skin tests in Michigan. Am J Vet Res. submitted 2004.
8. Norby, B. Tempelman, R.J., Hansonc, T.E., Kaneene, J.B., Bartlett, P.C. Estimation of sensitivity and specificity of bovine tuberculosis skin tests in Michigan when a perfect reference test is not available. Prev Vet Med. submitted 2004.
9. O'Brien, D.J., Schmitt, S.M., Berry, D.E., Fitzgerald, S.D., Vanneste, J.R., Lyon, T.J., Church, S.V., Fierke, J.S., Schooley, A.M., Cooley, T.M., Magsig, D., Zwick, L., and B.V. Thomsen: Estimating the True Prevalence of *M. bovis* in Hunter-harvested White-tailed Deer in Michigan. J Wildl Dis. 40:42-52, 2004.

**PROJECT CONTACT:**

Name: Kaneene, J. B.  
Phone: 517-353-5941  
Fax: 517-432-0976  
Email: kaneene@cvm.msu.edu

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**ACCESSION NO:** 0191695 **SUBFILE:** CRIS

**PROJ NO:** MICL07676 **AGENCY:** CSREES MICL

**PROJ TYPE:** SPECIAL GRANT **PROJ STATUS:** TERMINATED

**CONTRACT/GRANT/AGREEMENT NO:** 2002-34427-11829 **PROPOSAL NO:** 2002-06051

**START:** 01 SEP 2002 **TERM:** 31 AUG 2004 **FY:** 2006 **GRANT YR:** 2002

**GRANT AMT:** \$297,445

**INVESTIGATOR:** Kaneene, J. B.; Fitzgerald, D. D.; Bolin, S. R.; Bartlett, P. C.;  
Bolin, C. A.

**PERFORMING INSTITUTION:**

Population Medicine Center  
Michigan State University  
East Lansing, Michigan 48824

## BOVINE TUBERCULOSIS: EPIDEMIOLOGY, DIAGNOSIS, AND PATHOGENESIS

**NON-TECHNICAL SUMMARY:** Since bovine TB control programs for livestock have significant costs, there is a need to improve the performance of these programs. The proposed research will evaluate the costs of current TB control programs, the reliability of TB tests being used, and factors that influence the effectiveness of these programs. In addition, the study will try to identify new, more efficient methods of identifying bovine TB in cattle.

**OBJECTIVES:** There are six projects with specific objectives: Project 1 Objective: to develop a predictive risk assessment model, combining epidemiological and economic risk factors, for the effects of bovine TB infection on the Michigan cattle industry; Project 2 Objectives: 1) determine the sensitivity, specificity and predictive values and reliability of the CFT and the gamma-interferon blood test in Johne's-positive cattle herds, using the comparative cervical skin test (CCT) and mycobacterial culture for validation; 2) compare results of the CFT from Johne's-positive cattle with results from Johne's-negative cattle, using the CCT and mycobacterial culture for validation; and 3) to determine if cattle with advanced Johne's Disease are immunologically competent to respond appropriately to *M. bovis* antigens; Project 3 Objectives: 1) study the relative susceptibility of wild-type rodents to oral inoculation with *M. bovis*; 2) attempt to isolate *M. bovis* from inoculated rodents through fecal culture at multiple times post-inoculation, and from various organs at necropsy; 3) evaluate various tissues microscopically at multiple times post-inoculation to understand the pathogenesis of *M. bovis* in these rodents; and 4) evaluate rodents for the threat they pose in re-introduction of *M. bovis* to cattle farms, and their potential as sentinel species for infection on farms; Project 4 Objectives: 1) construct probability distributions of the prevalence of bovine TB in different sub-populations of Michigan domestic ruminants; 2) construct probability distributions of the false and true positives and false and true negatives resulting from the current serial testing (CFT/CCT) program in Michigan; and 3) estimate the rates of human injuries and deaths suffered during the bovine TB testing program in Michigan; Project 5 Objectives: 1) identify altered gene expression for bovine cytokines in cattle sensitized to *M. bovis*, using lymphocytes stimulated in vitro with purified protein derivative (PPD) from *M. bovis* or *M. avium*; and 2) identify additional genes from bovine lymphocytes that show altered expression attributable to exposure with *M. bovis*, using a cDNA microarray made from bovine lymphocytes and mRNA from lymphocytes stimulated in vitro with PPD from *M. bovis* or *M. avium*.

**APPROACH:** Project 1: Herd-based risk assessment models and models of TB in wild white-tailed deer in northeastern Michigan will be used to develop industry-level predictive models of levels of TB and its economic consequences to the state's cattle industry, so that the impact of herd-level or industry-level TB control measures, and their attendant costs, can be projected over periods of time and be used to determine which measures would be most efficient and cost-effective for the industry. Project 2: Objectives 1 & 2: To test effect of Johne's Disease (JD) on the caudal fold and comparative cervical skin tests and the gamma-interferon test for *Mycobacterium bovis*, cattle from dairy herds with no/low/high levels of JD will have TB skin tests administered. Blood and fecal samples will be collected to compare animal JD status (by fecal culture, ELISA and gamma-interferon for *M. paratuberculosis*) with results of TB skin tests and gamma-interferon testing. Objective 3: TB-negative cattle with and without JD will be injected with killed *M. bovis* antigen in a dose response study to compare the immune response of cattle with and without JD to respond to the *M. bovis* antigen. Project 3: Norway rats and wild rodents will be orally inoculated with high and low doses of *M. bovis*, with some sham-inoculated controls. Fecal cultures and body weights will be collected throughout the study. Groups will be euthanatized at different intervals, and results of gross necropsy, histopathology, acid-fast staining and bacterial culture will be assessed. Project 4: Objectives 1 & 2: Probabilistic risk assessment models will be developed to assess the prevalence of bovine TB on cattle operations in Michigan. Risk analysis software will be used to generate frequency distributions of rates of false-positives and -negatives from the Michigan TB livestock testing program. Objective 3: A survey on worker injuries will be administered to a random sample of the veterinarians involved with TB testing. Project 5: Objective 1: Whole blood will be collected from calves sensitized to *M. bovis*, and stimulated by incubation with PPD made from *M. bovis* or *M. avium*. Lymphocytes will be harvested and total cellular RNA will be obtained. RT-PCR and a real-time PCR detection system will be used to monitor up- and down-regulation, and altered product-ratios for bovine cytokines. Results from sensitized cattle will be compared to results from animals with natural infection. Objective2: Available cDNA microarrays made from bovine lymphocytes will be used to identify genes that are up-regulated or down-regulated after in vitro exposure of lymphocytes with either *M. bovis* or proteins derived from *M. bovis*. Total cellular RNA will be harvested from lymphocytes after stimulation with antigen, and reverse transcribed using an oligo (dT)15 primer to incorporate aminoallyl-modified dUTP into the single strand product. The fluorescent-labeled probe cDNAs will be hybridized to microarrays, the microarrays will be

washed several times, dried, and scanned to create reports of spot intensity ratios to identify genes that have altered levels of expression.

**PROGRESS: 2002/09 TO 2004/08**

Project 1: A stochastic risk assessment model for herd TB status was developed, based on results from a case-control study to identify herd management factors and environmental conditions associated with TB status. A method to examine trade-offs between expected benefits and expected costs of biosecurity management practices and investments was developed. The model is being updated with additional data from over 10 new TB-positive herds, and is being implemented in a form for on-farm use. Project 2: A prospective study was designed to determine if cattle infected with *Mycobacterium avium* subsp. *paratuberculosis* (JD) have a higher proportion of false positive caudal fold tuberculin test (CFT) results for TB when compared to uninfected cattle. Blood and fecal samples from 1043 cattle were subjected to *M. bovis* and *M. avium* gamma-interferon (INF-gamma) and JD antibody ELISA testing, and fecal culture. The overall false positive rate on the CFT was 17%. The high (>15%) and low (<15%) prevalence herds averaged 21 and 14% positive on the CFT, respectively, and 32 and 19% of JD positive (+) cows from high and low prevalence herds, respectively, were CFT positive. These results indicate an association between JD disease and false positive CFT. Project 3: The experimental infection study of wild house mice was completed, and mice were found to be highly susceptible to *M. bovis* and may pose a real threat to infected farms that are depopulated and later repopulated. The final analysis, combining results of several studies, shows that voles were the most susceptible to infection, mice were highly susceptible, and rats being highly resistant to both infection and shedding. A manuscript for publication comparing and summarizing these findings is in preparation. Project 4: The sensitivities of the CFT, CFT and comparative cervical tests (CCT) in series, and gross necropsy were 93, 88, and 86%, respectively. Sensitivities of skin tests were slightly higher when at least 2 lesions were found at gross necropsy. If 1 TB+ animal is enough to declare a herd TB+ and the tests used to classify a single animal as TB+ has a specificity of 1.0, the herd level performance of the TB skin tests in Michigan is very good. When prevalence is low, herd level sensitivity is correlated with TB prevalence and the size of the tested herd. Herd negative predictive value is very high and decreases slightly when herd size decreases. These results show that attention should be paid to smaller herds to meet the goal of TB eradication. Project 5: Whole blood from 5 false-positive CCT reactors, 1 lesion+ animal, 1 INF-gamma reactor, and 1 cow sensitized with sensitogen was stimulated with bovine PPD before harvest of total cellular RNA for determination of levels of cytokine gene expression compared with levels of 2 housekeeping genes. There was an increase in gene expression for 6 cytokines and INF-gamma, and decreased expression of IL-4 in the CCT reactors. The lesion+ animal showed an increase in expression of TNF-alpha, and IL-10 or INF-gamma. Additional RNA has been collected for further study, from a TB positive herd and a negative herd located outside of the TB endemic area.

**IMPACT: 2002/09 TO 2004/08**

Control and eradication of TB from the Michigan livestock industry requires an understanding of the disease and how it spreads, efficient disease detection methods, and the development of tools for control of the disease at the farm level. Risk assessment models can be used to develop sound, cost-effective disease control programs. The reliability of the caudal fold skin test, used for TB testing in livestock, may be affected by an animal's disease or vaccination status. These factors should be taken into consideration when interpreting TB skin test results, or designing a TB surveillance program. Current TB tests require great time, effort and expense, and false results are common with existing skin and blood tests. Even with TB lesions, many times associated with acid-fast bacilli, bacteria cannot be cultured because of poor samples, freeze-thaw, or lack of available fresh tissues. New DNA-based testing methods (cDNA microarray analysis of gene expression and laser-capture microscopy for isolating DNA for PCR) have the potential to become rapid, sensitive methods to identify TB in tissue samples in an efficient and reliable way. Determining what wildlife species can serve as reservoirs of *M. bovis* is fundamental to understanding the epidemiology of TB, which is necessary to develop effective disease eradication programs

**PUBLICATIONS (not previously reported): 2002/09 TO 2004/08**

No publications reported this period

**PROJECT CONTACT:**

Name: Kaneene, J. B.

Phone: 517-355-2269

Fax: 517-432-0976

**ACCESSION NO:** 0195202 **SUBFILE:** CRIS

**PROJ NO:** MICL07681 **AGENCY:** CSREES MICL

**PROJ TYPE:** SPECIAL GRANT **PROJ STATUS:** TERMINATED

**CONTRACT/GRANT/AGREEMENT NO:** 2003-34427-13292 **PROPOSAL NO:** 2003-06030

**START:** 01 JUL 2003 **TERM:** 30 JUN 2006 **FY:** 2006 **GRANT YR:** 2003

**GRANT AMT:** \$323,193

**INVESTIGATOR :** Kaneene, J. B.; Fitzgerald, S. D.; Grooms, D.; Bolin, S. R.;  
Bolin, C. A.; Wolf, C. A.; Fine, A.

**PERFORMING INSTITUTION:**

Large Animal Clinical Sciences  
Michigan State University  
East Lansing, Michigan 48824

**BOVINE TUBERCULOSIS: EPIDEMIOLOGY, DIAGNOSIS, AND PATHOGENESIS**

**NON-TECHNICAL SUMMARY:** Since bovine TB control programs for livestock have significant costs, there is a need to improve the performance of these programs. The proposed research will evaluate the costs of current TB control programs, the reliability of TB tests being used, and factors that influence the effectiveness of these programs. In addition, the study will try to identify new, more efficient methods of identifying bovine TB in cattle.

**OBJECTIVES:** There are four projects with specific objectives. Project 1 Objectives: 1) to validate the epidemiological and economic risk assessment models for a cattle herd becoming infected with bovine tuberculosis; and 2) develop a user-friendly software package to predict a herd's risk for the bovine tuberculosis, and estimate the costs associated with changing management practices identified as contributing to the herd risk for bovine tuberculosis. Project 2 Objectives: 1) determine the level of association between false positive rates in the caudal fold skin tests and levels of *M. paratuberculosis* infection in the cattle herd; 2) determine the incidence of *M. paratuberculosis* infection in cattle that are classified as suspects or reactors by the comparative cervical tuberculin test; 3) determine whether the administration of a vaccine containing a modified-live bovine viral diarrhea virus changes the response to the caudal fold tuberculin test or a-interferon test for bovine tuberculosis; and 4) determine whether the administration of a new *L. borgpetersenii* serovar *Hardjo* bacterin changes the response to the caudal fold tuberculin test or a-interferon test for bovine tuberculosis. Project 3 Objectives: 1) compare patterns of gene expression in WBC RNA from comparative cervical suspects or reactors from tuberculosis free herds, and cattle naturally infected with *M. bovis*; 2) optimize the DNA extraction process and the PCR reaction conditions to increase the sensitivity for detection of *M. bovis* in lesions that lack observable acid fast organisms; 3) develop and standardize DNA extraction and PCR techniques for detection of *M. bovis* in known positive animal tissues; 4) compare the sensitivity and specificity of this new technique to existing PCR on formalin-fixed tissue techniques; and 5) determine the utility of this new technique for wildlife and domestic animal tuberculosis surveillance, as well as experimental inoculation study application. Project 4 Objectives: 1) use bacteriologic culture and DNA-based testing techniques to identify *M. bovis* in environmental substrates from TB-affected cattle farms and areas with identified clusters of TB-infected white-tailed deer; 2) assess the effect of environmental conditions (humidity, temperature, and light) on the probability and duration of *M. bovis* survival in the environment; 3) study the relative susceptibility of mallard ducks to oral and intra-tracheal inoculation with *M. bovis* and attempt to isolate *M. bovis* from inoculated birds through fecal culture at multiple times post-inoculation, and from various organs at necropsy; 4) evaluate various tissues microscopically at multiple times post-inoculation to understand the pathogenesis of *M. bovis* in these birds; and 5) evaluate wild bird species for the threat they pose in re-introduction of *M. bovis* to cattle farms.

**APPROACH:** Project 1: Herd-based risk assessment models and economic models of TB in cattle herds in northeastern Michigan will be used to develop predictive models for a herd's risk for TB and its economic consequences, so that the impact and costs of herd-level TB control measures can be projected over periods of time and

be used to determine which measures would be most efficient and cost-effective. Project 2: Objectives 1-2: Cattle from dairy herds with no/low/high levels of Johne's Disease (JD) will receive caudal fold skin tests (CFT). Blood and feces will be collected to compare animal JD status with results of CFT and a-interferon testing. Objective 3: Calves free of BVDV will be sensitized to *M. bovis*, vaccinated with a modified-live virus vaccine containing attenuated BVDV, bovine herpesvirus-1, bovine respiratory syncytial virus, and parainfluenza-3. The CFT will be given after vaccination, and comparisons made between vaccinated and unvaccinated calves. Objective 4: Calves free of *Leptospira* will be sensitized to *M. bovis*, vaccinated with a monovalent serovar Hardjo vaccine, and given CFTs after vaccination. Comparisons will be made between CFT results from sensitized and unsensitized calves. Project 3: Objectives 1-2: Whole blood collected from calves sensitized to *M. bovis* will be stimulated with *M. bovis* or *M. avium* PPD to obtain total cellular RNA. RT-PCR and real-time PCR will monitor up- and down-regulation, and altered product-ratios for bovine cytokines. Available cDNA microarrays made from bovine lymphocytes will be used to identify genes that are up- or down-regulated after in vitro exposure of lymphocytes with *M. bovis* or proteins derived from *M. bovis*. Objectives 3-5: Extraction of DNA and PCR will be used on sections of formalin fixed, paraffin embedded tissue with microscopic lesions consistent with TB. A laser capture microdissection system will be used to dissect out microscopic granulomatous lesions for capture using HS Caps, DNA will be extracted, and real-time PCR will be conducted. Project 4: Objective 1: Soil, hay, and water samples will be inoculated with *M. bovis*. Processed samples will be analyzed for the presence of *M. bovis* by culture and PCR, and the most efficient method for processing environmental samples will be determined. Objectives 2-3: Locations on TB-infected cattle farms will be identified and samples of feces, feeds, open water, and pasture grass will be taken. Similar samples will be taken from sites in areas with high TB-prevalence in wildlife. Analysis for *M. bovis* will be done by culture, DNA probe, and IS6110 primer-based PCR. Objectives 3-5: Mallard ducks will be orally inoculated with high and low doses of *M. bovis*, with some sham-inoculated controls. Fecal cultures and body weights will be collected throughout the study. Groups will be euthanatized at different intervals, and results of gross necropsy, histopathology, acid-fast staining and bacterial culture will be evaluated.

#### **PROGRESS: 2003/07 TO 2006/06**

Project 1: The test version of a user-friendly software package to predict herd risk for TB, identify conditions on the farm associated with increasing TB risk, and estimate the economic costs associated with changing management practices identified as contributing to the herd risk for TB for on-farm use is undergoing field-testing and refinement, and the predictive risk assessment model for a herd becoming reinfected with TB after depopulation is being completed. Project 2: Four groups of 9 cattle each were sensitized with antigen from *M. bovis* to stimulate an immune response that would mimic natural infection when the cattle were tested for tuberculosis, using currently approved testing methods. One group was vaccinated with a modified live virus commonly used to control respiratory pathogens, another group was vaccinated with a commonly used inactivated bacterin for Leptospirosis, and 2 groups served as nonvaccinated controls. Neither vaccine affected the caudal fold test (CFT), and only the respiratory vaccine negatively affected the whole blood gamma interferon assay for tuberculosis. Project 3: Blood was collected 2 TB positive cattle, 5 skin test positive/lesion negative cattle, and 1 cow experimentally sensitized with inactivate antigen from *M. bovis* to determine if using cDNA microarrays to analyze gene regulation in response to stimulation of white blood cells with antigens derived from *M. bovis* would identify gene targets for secondary testing for TB. Altered gene expression patterns among cattle were detected using a cDNA microarray created from differentially expressed genes in bovine lymphocytes, but no clear targets were found. To determine if *M. avium* ssp *paratuberculosis* (MAP) infection affects currently used tests for TB, formalin fixed, paraffin embedded tissues from 300 cattle were tested for DNA from MAP. The cattle were lesion negative for TB on post mortem examination and tested as TB suspects on the CFT or were CFT negative. MAP was not associated with a positive reaction on the CFT. Project 4: Methods for processing environmental samples capable of detecting small numbers of *M. bovis* were established. Based on a cross-sectional study of environmental substrates collected on TB-affected cattle farms, *M. bovis* was not isolated from any samples (soil, water, feed) collected from 13 TB-affected cattle farms and 5 wildlife areas with known TB. The study to determine the effect of substrate (water, soil, hay, grain) and environmental conditions (humidity, temperature, sunlight) on the persistence of viable *M. bovis* in the environment found that *M. bovis* can persist for 6-10 weeks in cooler seasons. These results are being prepared in 3 papers for publication in scientific journals. Mallard ducks are highly resistant to oral infection with TB, and do not shed the organism in feces. Results of this study were published in 2005.

#### **IMPACT: 2003/07 TO 2006/06**

Control and eradication of TB from the Michigan livestock industry requires an understanding of the disease and how it

spreads, efficient disease detection methods, and the development of tools for control of the disease at the farm level. Risk assessment models can be used to develop sound, cost-effective disease control programs. The reliability of the caudal fold skin test, used for TB testing in livestock, may be affected by animal disease or vaccination status. These factors should be taken into consideration when interpreting TB skin test results, or designing a TB surveillance program. Current TB tests require great time, effort and expense, and false results are common with existing skin and blood tests. Even with TB lesions, many times associated with acid-fast bacilli, bacteria cannot be cultured because of poor samples, freeze-thaw, or lack of available fresh tissues. New DNA-based testing methods (cDNA microarray analysis of gene expression and laser-capture microscopy for isolating DNA for PCR) have the potential to become rapid, sensitive methods to identify TB in tissue samples in an efficient and reliable way. Determining where in the environment and ecosystem *M. bovis* exists, and the length of time it survives and remains infective, is fundamental to understanding the epidemiology of TB, which is necessary to develop effective disease eradication programs. Experiments have shown that some wild bird species may contribute to the maintenance and spread of TB in wildlife and livestock.

**PUBLICATIONS (not previously reported):** 2003/07 TO 2006/06

Fine, A.E. The role of indirect transmission in the epidemiology of bovine tuberculosis in cattle and white-tailed deer in Michigan. Ph.D. Thesis, Michigan State University, East Lansing, Michigan, 2006.

**PROJECT CONTACT:**

Name: Kaneene, J. B.

Phone: 517-353-5941

Fax: 517-432-0976

Email: kaneene@cvm.msu.edu

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**ACCESSION NO:** 0203138 **SUBFILE:** CRIS

**PROJ NO:** MICL07691 **AGENCY:** CSREES MICL

**PROJ TYPE:** SPECIAL GRANT **PROJ STATUS:** EXTENDED

**CONTRACT/GRANT/AGREEMENT NO:** 2005-34427-15887 **PROPOSAL NO:** 2005-06033

**START:** 15 SEP 2005 **TERM:** 14 SEP 2008 **FY:** 2006 **GRANT YR:** 2005

**GRANT AMT:** \$328,726

**INVESTIGATOR:** Kaneene, J. B.; Fitzgerald, S. D.; Bolin, S. R.; Griffore, R.;  
Phenice, L.

**PERFORMING INSTITUTION:**

Large Animal Clinical Sciences

Michigan State University

East Lansing, Michigan 48824

**BOVINE TUBERCULOSIS: EPIDEMIOLOGY, DIAGNOSIS, AND PATHOGENESIS**

**NON-TECHNICAL SUMMARY:** Bovine tuberculosis (TB) in Michigan is being recognized as more prevalent in wildlife and livestock species than originally thought. The current combination of active and passive surveillance programs, as well as TB control and eradication efforts, have shown that more research is needed to provide information needed to deal with the problem. From previous funding, we are conducting studies to determine the major factors influencing TB transmission in wild white-tailed deer and cattle, and to determine how well TB surveillance and TB control programs for wildlife and cattle are working. In conducting these studies, we observed that there is great need to improve the efficiency and accuracy of livestock TB testing, and that the TB outbreak has had serious financial and psychological consequences for affected farm families. It is also apparent that, while current disease control programs for wildlife are reducing TB in deer, additional disease control methods to eliminate TB from wildlife are becoming necessary. The purpose of this study is to address these research needs.

**OBJECTIVES:** There are four projects with specific objectives in this study. Project 1 objectives: 1) Identify factors associated with risk of finding CCT reactor cattle on the farm, including data collected via questionnaire during routine

TB testing, wildlife surveillance data (cervid and non-cervid surveillance), and geological and ecological factors around the farm; 2) Describe and quantify risk into distinct levels for use in TB testing, develop testing protocols for each specific risk level, and develop a risk calculator based on results from Objective a, for use on laptop or PDA, to calculate farm risk for TB and recommend testing. Project 2 objectives: 1) Vaccinate a *Mycobacterium*-susceptible mouse strain (BALBc) with either a RB51 vector vaccine or a BCG vaccine; 2) challenge those mice with deer-origin *M. bovis*; 3) evaluate those animals over several months for fecal shedding of the organism, clinical signs, and terminal necropsy for histologic evaluation and mycobacterial isolation and titration; 4) compare results unvaccinated, *M. bovis* challenged mice to evaluate vaccine efficacy in increasing disease resistance, decreasing lesion development and mycobacterial organism replication, and controlling shedding of *M. bovis*. Project 3 objectives: 1) Compare proportions of false positive whole blood gamma interferon assays with and without ESAT-6/CFP-10 stimulation; 2) Compare proportions of false positive whole blood gamma interferon assays with and without ESAT-6/CFP-10 stimulation by geographic region and season. Project 4 objectives: 1) Collect information about relevant farm characteristics, and family attitudes and behavior patterns via self-descriptions; 2) incorporate these into regression models to identify factors that differ between farm families that have and have not been directly affected by bovine TB.

**APPROACH:** Project 1: A retrospective and nested case-control study will be conducted to identify factors that are associated with positive CCT test in individual CCT reactor cattle. Results of this analysis, combined with existing data on TB risk from our previous work, will be used to develop distribution curves for TB risk based on risk factors, and risk levels will be categorized for use in designing testing protocols based on levels of risk. Project 2: An experimental study will be conducted to compare the efficacy of a new recombinant *M. bovis* vaccine with the existing BCG vaccine in a mouse model. Vaccinated mice will be challenged with different levels of *M. bovis* cultured from Michigan wildlife, and levels of bacterial shedding, clinical signs, lesion development and histopathological results will be compared between the two vaccine groups and challenge levels. Project 3: An experimental study will be conducted to determine if use of ESAT-6/CFP-10 improves the whole blood gamma interferon assay for *M. bovis* by reducing false positive results. Blood samples collected during TB surveillance will be subjected to the currently used whole blood gamma interferon assay and to an additional stimulation phase with ESAT-6/CFP-10. False positive rates will be computed for samples with and without additional stimulation to determine if use of ESAT-6/CFP-10 reduces the numbers of false positive results. Project 4: A case-control study will be conducted to determine if there are differences in the ways that farm families interact with their farm ecosystems between farms that have and have not been infected with *M. bovis*. This will be a post-test-only control group design, using survey methodology to collect data. Questionnaires will be administered to both groups to collect data on farm family attitudes and behaviors, physical characteristics of the farm, and the farm's location. These data will be used to determine if there are any significant differences in attitudes and behaviors of those families whose farms have been affected by TB with those of families in the region whose farms have not been directly affected by TB.

**PROGRESS:** 2005/09 TO 2006/09

Project 1: The retrospective and nested case-control study for factors associated with positive CCT tests in individual reactors is ongoing. Completed surveys of farm risk factors has been collected and are being entered into a computerized database to add to existing risk factor information to complete the study. Project 2: This project has been completed. Twenty-eight BALBc mice were vaccinated twice with one of two vaccines, including standard BCG vaccine (n=12), and a new recombinant vaccine (n=16), then challenged intranasally with live *Mycobacterium bovis*. All of twelve unvaccinated control mice lost weight, became moribund, and were sacrificed within 4 weeks of challenge; results were similar with the recombinant vaccine mice. BCG-vaccinated mice maintained activity and body weight, and only two of twelve mice needed to be sacrificed seven weeks post challenge. The subunit vaccine showed marked reduction in mortality, gross and microscopic lesions compared to unvaccinated mice, which shows good promise for future development of a deer or cattle vaccine that will not interfere with current testing methods. Project 3: A total of 1,912 field samples of whole blood from CFT+ cattle, and 315 samples from cattle examined post mortem that were CFT+ and CCT and/or gamma-interferon positive, were stimulated with recombinant ESAT-6/CFP-10 and tested in the gamma interferon assay for bovine tuberculosis. The samples tested included whole blood from 5 lesion positive cattle. The purpose was to determine if ESAT-6/CFP-10 (E/C) as a *Mycobacterium bovis* specific antigen would stimulate white blood cells collected under field conditions to produce sufficient gamma interferon to be detected in the gamma interferon ELISA for bovine tuberculosis. Work is currently under way to match these test results with data from individual cattle that are in USDA whole-herd testing records. Preliminary results indicate that E/C vastly reduces the rates of false positives tests (increases test sensitivity). These results were communicated to the

Scientific Advisory Committee of the Bovine Tuberculosis Committee of the USAHA in 2006. Project 4: We conducted focus groups in northern Michigan with four County Extension Directors and five veterinarians, and a focus group at Michigan State University with six epidemiologists, to obtain information that could be used in developing the questionnaire to collect data from farm families on TB-positive farms and control farm families. The questionnaire, based on results from the focus group, has been finalized. A database of potential farm family participants is being gathered, and the questionnaire and a revised research protocol have been submitted to the MSU Social, Behavioral, Education Institutional Review Board (SIRB). We are currently awaiting approval from SIRB to begin data collection.

**IMPACT: 2005/09 TO 2006/09**

By making TB testing for cattle more reliable (Projects 1 and 3) and conducting the basic scientific research (Project 2) needed to develop a vaccine to prevent TB in cattle, this research will reduce the economic costs of TB in Michigan by preventing the disease and wasting less time and money on false TB test results. Comparing farm families with and without TB (Project 4) will give us information that can be used to raise awareness of the social and emotional costs of TB, and to create programs to help affected families deal with social and emotional problems caused by having TB on their farms.

**PUBLICATIONS (not previously reported): 2005/09 TO 2006/09**

No publications reported this period

**PROJECT CONTACT:**

Name: Kaneene, J. B.

Phone: 517-355-2269

Fax: 517-432-0976

Email: kaneene@cvm.msu.edu

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**ACCESSION NO:** 0199414 **SUBFILE:** CRIS

**PROJ NO:** MICL07692 **AGENCY:** CSREES MICL

**PROJ TYPE:** SPECIAL GRANT **PROJ STATUS:** TERMINATED

**CONTRACT/GRANT/AGREEMENT NO:** 2004-34427-14585 **PROPOSAL NO:** 2004-06033

**START:** 01 SEP 2004 **TERM:** 31 AUG 2007 **FY:** 2006 **GRANT YR:** 2004

**GRANT AMT:** \$288,804

**INVESTIGATOR:** Kaneene, J. B.; Fitzgerald, S. D.; Bolin, S. R.; Grooms, D. L.;  
Bolin, C. A.

**PERFORMING INSTITUTION:**

Large Animal Clinical Sciences

Michigan State University

East Lansing, Michigan 48824

**BOVINE TUBERCULOSIS:EPIDEMIOLOGY, DIAGNOSIS, AND PATHOGENESIS**

**NON-TECHNICAL SUMMARY:** Since bovine TB control and prevention programs for livestock have significant costs, there is a need to improve the performance of these programs. The proposed research will evaluate current TB control and prevention programs, the reliability of TB tests being used, factors that influence the effectiveness of these tests and programs, and the efficacy of two TB vaccines for animals.

**OBJECTIVES:** There are four projects with specific objectives. Project 1 Objectives: 1) Identify risk factors associated with reacquiring TB after repopulation, including factors associated with herd biosecurity, cattle movement to and from affected herds, cattle feeding practices, cattle housing, and wildlife access to livestock and livestock feed; 2) Evaluate the spatial relationship between risk for reacquiring TB and proximity to other herds affected by TB, deer habitat, surface water features, and other ecological features in the region; and 3) Determine association between herd TB status and herd-related management factors, geographic location of environmental conditions, proximity to TB positive herds, levels of TB in deer. Project 2 Objectives: 1) Determine the level of association between false positive

rates in the caudal fold skin tests (CFT) and levels of *M. paratuberculosis* infection in the cattle herd; and 2) Determine the prevalence of *M. paratuberculosis* infection in cattle that are classified as suspects or reactors by the comparative cervical tuberculin test (CCT); 3) determine whether the administration of a vaccine containing a modified-live bovine viral diarrhea virus changes the response to the caudal fold tuberculin test or gamma interferon test for bovine tuberculosis; 4) determine whether the administration of a new *L. borgpetersenii* serovar *Hardjo* bacterin changes the response to the caudal fold tuberculin test or gamma-interferon test for bovine tuberculosis; 5) Retrospectively apply PCR to formalin-fixed, paraffin-embedded sections of ileum and determine the prevalence of *M. paratuberculosis* infected cattle that falsely test as suspects or reactors by 1) the CFT, 2) the CCT, and 3) cattle that are skin test negative; and 6) Compare resulting prevalences of false reactors by the two skin tests with the negative test population as a negative control to determine effect of Johnes infection on test results. Project 3 Objectives: 1) Identify targets of altered gene expression after 0, 1, 2, 4 or 20 hours of antigen stimulation to determine optimal time for whole blood stimulation; and 2) compare patterns of gene expression in WBC RNA from comparative cervical suspects or reactors from tuberculosis free herds, and cattle naturally infected with *M. bovis*. Project 4 Objectives: 1) Evaluate BALB/c mice vaccinated with a RB51 vector vaccine or a BCG vaccine over several months after challenge with deer-origin *M. bovis* for fecal shedding of the organism, clinical signs, and terminal necropsy for histologic evaluation and mycobacterial isolation and titration; and 2) Compare results with unvaccinated, *M. bovis*-challenged mice to evaluate vaccine efficacy in increasing disease resistance, decreasing lesion development and mycobacterial organism replication, and controlling shedding of *M. bovis*.

**APPROACH:** Project 1, Part A: A case-control study will compare risk factors (farm location, ecological data, herd management practices before and after restocking) between herds diagnosed with TB that were depopulated and repopulated (controls) with repopulated herds that have become reinfected with TB (cases). Project I, Part B: A retrospective case-control study will compare spatial risk factors between herds diagnosed with TB since the beginning of the current disease outbreak (cases) and herds that have not been diagnosed with TB (controls) from the five county area. Case herds will be those. Risk factors include livestock housing location data (located by Global Positioning Satellite (GPS) systems), specific ecological conditions in cattle housing areas, and herd management practices. Project 2, Part A: The effect of infection with *M. paratuberculosis* on results of the bovine TB caudal fold test (CFT) test and gamma interferon assay will be assessed by comparing the false negative rate for these two assays in Johnes disease high prevalence dairy herds and herds known to be free of Johnes disease. Project 2, Part B: The effect of use of select veterinary vaccines on the reliability of the CFT for TB in cattle will be tested by comparing CFT test results and *M. bovis* gamma interferon production between groups of calves sensitized to *M. bovis* that are unvaccinated or vaccinated with a commercially available vaccine containing modified-live bovine viral diarrhea virus (BVDV), infectious bovine rhinotracheitis (IBR), PI-3 and bovine respiratory syncytial virus (BRSV) (Pyramid, Ft. Dodge Animal Health, Fort Dodge, IA). Project 2, Part C: A retrospective study of the role of *M. paratuberculosis* in false reactor response on the CFT and the comparative cervical test (CCT) will compare levels of *M. paratuberculosis* between CFT positive/*M. bovis* culture negative cattle and CFT negative cattle by PCR for *M. paratuberculosis* from sections of ileum and ileal-cecal lymph nodes. Project 3, Part A: The optimal time of exposure of whole blood to bovine ppd for detection of diagnostic gene targets in caudal fold suspect cattle will be determined by comparing levels of altered expression of 10 genes after 0, 1, 2, 4 or 20 hours of antigen stimulation, between cattle that have been sensitized to *M. bovis* and cattle that have not been sensitized. Project 3, Part B: Optimal gene targets for detection of bovine tuberculosis will be identified by stimulating blood with phosphate-buffered saline (PBS) (negative control), *M. avium* purified protein derivative (PPD), and *M. bovis* PPD, and harvesting total cellular RNA to generate cDNA for use in real-time quantitative polymerase chain reaction (RT-QPCR). Project 4: The efficacy of BCG vaccine and a recombinant vector vaccine (RB-51) for *M. bovis* in laboratory mice will be tested by comparing lesion development and mycobacterial isolation results from vaccinated and unvaccinated mice challenged with deer-origin *M. bovis*.

**PROGRESS:** 2004/09 TO 2007/08

Project 1: The predictive risk assessment model for reacquiring TB and proximity to other herds affected by TB, deer habitat, surface water features, and other ecological features in the region has been finalized. Updated information on data from newly infected cattle herds (biosecurity, cattle movement to and from affected herds, cattle feeding practices, cattle housing, and wildlife access to livestock and livestock feed) and additional retrospective data collection was used to refine the existing predictive model, which is undergoing testing. Project 2: Dairy cattle with Johnes's disease (JD, infection with *M. avium* ssp. *paratuberculosis* [n=11]) and age-matched cattle without JD (n=8) were sensitized with antigen from *M. bovis* to stimulate an immune response that would cause the cattle to test positive for TB using

currently approved testing methods. JD did not affect the result of the caudal fold test (CFT), as all sensitized cattle showed a positive reaction, but did adversely affect the results of the whole blood gamma interferon test in some cattle. Project 3: To identify altered gene expression patterns in cattle that are false positive on current TB tests as potential diagnostic targets for TB detection, whole blood was collected from 60 lesion negative cattle suspect for TB on the CFT and the comparative cervical test (CCT) or the whole blood gamma interferon test, and 19 microarray analyses have been completed for RNA samples from blood pre-stimulated with *M. bovis* antigen for 4 hrs (n=15; 7 to CFT reactors, 4 double reactors, 4 TB positive) and 0-hr (n=4; all double reactors). Altered gene expression of 5-fold or greater was seen in each group: 10 up- and 2 down-regulated genes from CFT reactors, 223 up- and 5 down-regulated genes from double reactors, and 12 up- and 5 down-regulated genes from TB positives. No genes demonstrating altered expression levels were shared among or between these groups of cattle. The 0-hr microarrays showed only 4 genes with altered expression and none showed altered levels that were greater than 5-fold above or below control values. Project 4: BALBc mice were vaccinated twice with standard BCG or a new recombinant vaccine, then challenged intranasally with live *M. bovis*. 12 unvaccinated controls and 12 recombinant vaccine mice lost weight, became moribund, and were sacrificed within 4 weeks of challenge. BCG vaccinates maintained activity and body weight, and only 2 of 12 mice were sacrificed 7 weeks post challenge. The recombinant vaccine showed marked reduction in mortality, gross and microscopic lesions compared to controls, which shows promise for development of a vaccine that will not interfere with current tests. A second trial was performed using a modified subunit vaccine: weight loss, lesions development, and mortality were reduced compared to controls, but slightly higher compared to BCG vaccinates. Final summarization of the study is pending on final mycobacterial isolation and titration. A study was conducted on Michigan strains of *M. bovis* isolates from 1999 and 2004, to look for evidence of antimicrobial resistance, and no evidence of antimicrobial resistance development was seen.

#### **IMPACT: 2004/09 TO 2007/08**

Infection of cattle with John's disease does not appear to have major influence on the rate of false positive skin TB tests in Michigan, but may cause cattle to test negative on some secondary laboratory diagnostic assays. Results of gene expression profiling showed that there are promising gene targets that may be used for developing diagnostic tools to detect TB in live cattle. The intranasal challenge in BALBc mice is an efficient system for testing efficacy of tuberculosis vaccines. BCG vaccine demonstrated good protection to challenge, and the redesigned recombinant vaccine was much more effective than earlier recombinant vaccines. Lack of antimicrobial resistance in *M. bovis* from Michigan is important for the treatment of TB if cases in humans occur.

#### **PUBLICATIONS (not previously reported): 2004/09 TO 2007/08**

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2. Clarke, K.R., Fitzgerald, S.D., Zwick, L.S., Church, S.V., Kaneene, J.B., Wismer, A.R., Bolin, C.A., Hattey, J.A., Yuzbasiyan-Gurkan, V. Experimental inoculation of meadow voles (*Microtus pennsylvanicus*), and Norway rats (*Rattus norvegicus*) with *Mycobacterium bovis*. J. Wildl. Dis., 43(3): 353-365, 2007.
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4. Miller, R. and Kaneene, J.B. Evaluation of historical factors influencing the occurrence and distribution of *Mycobacterium bovis* infection among wildlife in Michigan. AJVR, Vol. 67 (4): 604-615, 2006.
5. Miller, R., Kaneene, J.B., Schmitt, S.M., Lusch, D.P., Fitzgerald, S.D. Spatial analysis of *Mycobacterium bovis* infection in white-tailed deer (*Odocoileus virginianus*) in Michigan, USA. Prev. Vet. Med., doi:10.1016/j.prevetmed.2007.05.011, 2007.
6. Norby, B., Bartlett, P.C., Grooms, D.L., Kaneene, J.B., Bruning-Fann, C.S. Use of simulation modeling to estimate herd-level sensitivity, specificity, and predictive values of diagnostic tests for detection of tuberculosis in cattle. Am. J. Veterinary Research, 66(7): 1285-1291, 2005.

#### **PROJECT CONTACT:**

Name: Kaneene, J. B.

Phone: 517-355-2269

Fax: 517-432-0976

Email: kaneene@cvm.msu.edu

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**ACCESSION NO:** 0206672 **SUBFILE:** CRIS  
**PROJ NO:** MICL07708 **AGENCY:** CSREES MICL  
**PROJ TYPE:** SPECIAL GRANT **PROJ STATUS:** NEW  
**CONTRACT/GRANT/AGREEMENT NO:** 2006-34427-17171 **PROPOSAL NO:** 2006-06046  
**START:** 01 SEP 2006 **TERM:** 31 AUG 2008 **FY:** 2006 **GRANT YR:** 2006  
**GRANT AMT:** \$329,022

**INVESTIGATOR:** Kaneene, J. B.; Fitzgerald, S. D.; Bolin, S. R.; Bolin, C. A.;  
Fine, A. E.

**PERFORMING INSTITUTION:**

Large Animal Clinical Sciences  
Michigan State University  
East Lansing, Michigan 48824

**BOVINE TUBERCULOSIS: EPIDEMIOLOGY, DIAGNOSIS, AND PATHOGENESIS**

**NON-TECHNICAL SUMMARY:** Since bovine TB control programs for livestock have significant costs, there is a need to improve the performance of these programs. A risk calculator has been designed for farmers, to identify problem areas that can be corrected to reduce TB risk to their farms. The proposed research will also work to improve testing to detect TB in farm environments, and in wild deer, cattle, and in farm cats.

**OBJECTIVES:** To aid in the development of risk-based surveillance system, the objectives of the first project are to continue testing of the on-farm risk calculator to estimate farm risk for TB, adding enhancements to improve ease of use in the field, and collecting additional risk factor data to the current body of data used to generate risk model parameters, and to continue model development and refinement, by validating the existing model with data from new TB-positive herds from Michigan, and from TB-positive herds from Minnesota and any other states if present. The second project seeks to demonstrate that molecular detection techniques will improve our ability to identify *Mycobacterium bovis* in soil, hay, water and similar substrates and enable an accurate characterization of the persistence and distribution of *M. bovis* in farm environments. The objectives for this project are to test and validate the molecular detection techniques with an extensive set of environmental samples experimentally inoculated with *M. bovis* and previously processed for mycobacterial culture, and then apply the validated molecular detection technique to environmental substrates collected from bovine TB transmission sites in Michigan. The third project is designed to determine whether a rapid (30-minute or less), easy-to-use, and sensitive card test can be applied directly to lesioned deer or cattle tissues to screen for the detection of *M. bovis* under field conditions, with minimal equipment or specialized training. The first objective of this project is to apply a new smartDNA technique to one season of hunter-harvested deer (est. 50 animals) to quickly screen lesioned lymph nodes, and compare results with traditional methods of histopathology, acid-fast staining, mycobacterial isolation and PCR techniques, to determine sensitivity and specificity. The same lesioned deer will have the new smartDNA test applied to tonsillar or oral cavity tissues to try to detect *M. bovis* shedding, and later correlate these results with histopathology, culture, and lesion distribution to gain insight into what gross lesions may indicate a shedding animal. The next objective is to apply the smartDNA technique to TB-reactor cattle submitted to the MI state Diagnostic Center for Population and Animal Health (DCPAH) to suspect lesions, and again correlate with histopathology, acid-fast staining, culture and PCR results, to evaluate its suitability for use in USDA-inspected slaughterhouse cattle surveillance setting. The fourth project is to investigate whether free-ranging domestic cats can serve as sentinels for TB in circumstances where they frequently come into contact with potentially tuberculosis large animals. The objectives of this project are to sensitize a group of cats using killed *M. bovis* to stimulate an antibody response, and evaluate several different ante-mortem tuberculosis testing techniques (ELISA, MAPIA, TB Rapid Test) under both laboratory and field conditions in order to choose the optimal method for on-farm surveillance.

**APPROACH:** Project 1: The on-farm risk calculator, based on a retrospective and matched case-control study to identify factors that are associated with positive CCT tests in individual CCT reactor cattle, will be field tested and refined for ease of use on the farm. We plan to use data from recently-infected herds in Michigan, and other states such

as Minnesota, to refine distribution curves for TB risk based on risk factors, and to modify risk level categories for use in designing testing protocols based on levels of risk. Project 2: To circumvent problems of contamination when attempting to culture *M. bovis* from environmental samples, we will test for the presence of *M. bovis* using PCR procedures that target antigen genes unique to the *M. tuberculosis* complex: mpb70 and mpb64. Soil, corn, hay, and water samples that were inoculated with *M. bovis* and subjected to environmental conditions will be used. DNA or RNA will be extracted from soil samples using specialized kits from Mobio Laboratories. For other samples, the MasterPure DNA/RNA Extraction Kit from Epicentre will be used. To confirm that the *M. bovis* detected by PCR is viable, we will use reverse transcription PCR to detect 16s ribosomal RNA, confirmed by nucleic acid sequencing. Project 3: SmartDNA(TM) test cards, containing strips that react to the presence of target nucleic acid sequences without the need for amplification, will be used on samples collected from white-tailed deer during TB surveillance, and from TB suspect and reactor cattle. Lesions detected in deer heads or whole carcasses in TB surveillance will be loaded into the detection card by sterile disposable swabs, and read after 30 minutes. Swabs of the oral cavity and tonsillar area will be loaded into a detection card, and results used to determine whether or not this lesioned deer is shedding *M. bovis*. All cattle with gross lesions suggestive of TB will be tested using the detection cards, and standard histopathology and acid fast staining, mycobacterial isolation and identification and PCR testing will be done according to current USDA protocols. Card results will be compared to isolation/PCR results to evaluate sensitivity and specificity of the assay. Project 4: We will develop and assess 4 serologic tests for detection of *M. bovis* in cats (ELISA, multi-antigen print immunoassay (MAPIA), lateral-flow antibody detection test (TB Rapid Test) to be developed in collaboration with ChemBio Diagnostics, Inc). Six cats will be sensitized by intradermal injection with inactivated *M. bovis* (sensitogen) 2x, 3 weeks apart. Four ml of blood will be drawn from the jugular veins of anesthetized cats, and 0.5 ml of sera will be shipped to Iowa State University for use in another ELISA that has shown promise in limited field use. Another 1.0 ml of sera will be shipped to ChemBio Diagnostics for development and application of their MAPIA and TB Rapid Tests. These tests will be performed at 30-day intervals (0-150 days pi) until each cat converts positive or is euthanized. Two non-sensitized control cats will be similarly sampled. Cats from TB-positive farms will be used to validate the MAPIA and TB Rapid Tests.

**PROJECT CONTACT:**

Name: Kaneene, J. B.

Phone: 517-353-5941

Fax: 517-432-0976

Email: kaneene@cvm.msu.edu, rmiller@cvm.msu.edu

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**ACCESSION NO:** 0203692 **SUBFILE:** CRIS

**PROJ NO:** MICL08381 **AGENCY:** CSREES MICL

**PROJ TYPE:** SERD GRANT **PROJ STATUS:** EXTENDED

**CONTRACT/GRANT/AGREEMENT NO:** 2005-38411-15862 **PROPOSAL NO:** 2005-03319

**START:** 01 SEP 2005 **TERM:** 31 AUG 2008 **FY:** 2006 **GRANT YR:** 2005

**GRANT AMT:** \$71,880

**INVESTIGATOR:** Kramer, D.; Christoffel, R. A.; Felix, A. B.; Lamp, N. E.; Wolfson, L. G.; Campa, I. R.; Hayes, D.; Millenbah, K. F.; Fine, A.

**PERFORMING INSTITUTION:**

Fisheries and Wildlife

Michigan State University

East Lansing, Michigan 48824

**DEVELOPMENT OF A NATURAL RESOURCES FIELD INSTITUTE: SHAPING FUTURE PROFESSIONALS THROUGH EXPERIENTIAL LEARNING AND TEACHING**

**NON-TECHNICAL SUMMARY:** A Graduate students in natural resources fields have few teaching opportunities because research supports most graduate appointments. B Increasing numbers of urban students possessing great experience with computers than the outdoors are enrolling in NR programs, and they lack outdoor skills needed for

future academic and professional success. C Agency personnel observe that recent student job applicants do not have adequate backgrounds in natural history, field skills, etc., to be effective employees. Our project goal is to strengthen NR student preparation through experiential learning and teaching enhancement.

**OBJECTIVES:** Objective 1 is to develop a sophomore level field-based institute designed to reduce student anxieties and correct misconceptions about working outdoors. Objective 2 is to provide undergraduate and graduate students with professional contacts and experiences to strengthen skills needed for future internships or jobs. Objective 3 is to evaluate the course's success as it relates to student learning and teaching enhancement.

**APPROACH:** The MSU Natural Resources Field Institute (NRFI) is being developed by 3 Ph.D. students (Teaching Fellows) and 6 faculty. We have developed objectives and a syllabus and identified skills students will obtain during the NRFI. Activities will give students hands-on, outdoor experiences, data collection and analysis participation and discussions of ongoing research with NR professionals. When funding is secured, equipment will be purchased and logistical arrangements made. Course advertising begins in the fall of 2005. Prior to the course (May 06), co-PDs will have specific responsibilities for its implementation and evaluation. Teaching Fellows will facilitate the course and remain for its duration. Faculty will provide a session(s) and advise and evaluate Teaching Fellows. We have identified important skills for students to develop prior to degree completion such as orienteering, map reading, communication, networking, critical thinking, problem solving, data collection and analysis, contextual thinking, and natural history knowledge. The NRFI is designed to strengthen proficiencies in these areas. For example, we will utilize peer to facilitate orienteering and map reading skills development in students by pairing up low scoring (<80%) students with individuals having demonstrated orienteering and map reading competency by scoring >80% on a quiz. Activities to strengthen communication skills and provide networking opportunities include informal and formal interactions between students and instructors. For example, evening fireside chats will provide opportunities for participants to debrief and reflect upon activities, get to know instructors in an informal setting, and give instructors opportunities to interact with students and become familiar with their educational and professional goals. Several activities are included to develop student understanding of scientific methods. Field exercises will strengthen application skills; prompting them with questions will build contextual thinking skills. Learner-centered activities will help students develop technical skills needed for careers, explore new ideas and become critical thinkers. To assess fulfillment of our objectives, we will conduct post-course evaluations. Students will rate course enjoyment, effectiveness of instructors, specific skills enhancement, and provide recommendations for future NRFIs. The final project and its presentation will indicate how well students met NRFI learning objectives. One year post-course, we will administer a survey to two student groups, those who have completed our NRFI and a control group. Students will assess how well they felt their previous courses prepared them for upper-level courses, exposed them to different directions they could follow in the NR field and provided them with experiences to facilitate career development. This is critical for assessing curriculum effectiveness and identifying ways to improve NR programs to meet career/professional development needs of students. Faculty will evaluate instructional capabilities of Teaching Fellows.

**PROGRESS:** 2005/09 TO 2006/09

We developed a field course to help students overcome fear or misconceptions about natural resource (NR) management fieldwork. We identified important skills for students to develop and designed our course to include activities to build these proficiencies. We partnered with a hunt club, Mid-Forest Lodge (MFL) and worked with MFL's forester and biologist on course logistics and field research project identification. We advertised the course by: distributing brochures at 3 conferences; presenting to student clubs; enlisting faculty in course promotion; and sending announcements to CIC institutions and nearby colleges and posting it on listservs. Teaching Fellows (TF) purchased course equipment; finalized the class syllabus, teaching duties, and course details; reviewed applications; created, collected, copied, and collated course materials; and held a pre-course meeting with students to make introductions, give a course overview, complete forms, and answer course-related questions. During the course, TFs facilitated, instructed and led field teams. Faculty co-PDs and 4 external professionals provided a classroom and/or field session(s) and advised TFs. Seven female and 7 male students participated, nine from urban or suburban backgrounds. Fireside chats provided students with professional contacts and networking opportunities. The Assistant Chief of the Wildlife Division, MDNR led a chat about local emerging NR issues. MI State Director for USDA-APHIS, Wildlife Services led a chat about his agency and the growing need for professionals that can effectively deal with human-wildlife conflicts. He prepared students for a field trip to explore the bovine tuberculosis (TB) issue. Students had many opportunities to enhance their communication skills on their 2 teams: 1) a fieldwork data collection team and 2) a

research team that analyzed data, wrote a report and gave an oral presentation to their peers, TFs, and interested MFL members. Students developed (1) a better understanding of and gained hands-on experience with scientific research methods, skills that agencies have identified as important for employees and (2) an understanding of how and what data to record and why through field research projects and entering data into a computer program and analyzing data for research presentations. Classroom sessions, available resources including publications and specimens, and field sessions provided species identification and natural history information. Students were encouraged to reflect on their experiences and question what they observed. A journaling assignment helped students work through course concerns and alerted TFs to such concerns and points that had not been fully grasped by students. TFs worked with and got to know their field teams quite well. This led to many conversations and facilitated student-TF interactions to clarify instructions or ambiguities from classroom sessions. Students provided suggestions for future course iterations and completed assessments regarding course enjoyment, visiting professionals, and the importance of what they learned about NR management and themselves. PRODUCTS: OUTCOMES: DISSEMINATION ACTIVITIES: FUTURE INITIATIVES:

**IMPACT: 2005/09 TO 2006/09**

Several recent changes have occurred in NR-related fields: (1) most natural history and identification classes have been cut from requirements; (2) recent students include more females and individuals from suburban and urban backgrounds; and (3) there is increasing demand by NR employers to hire people with field experience, critical thinking and problem-solving skills, knowledge of ecosystem structure, species life-history traits, and abilities to use and apply new technology to address management issues. The sheer magnitude of changes facing academics makes preparation of undergraduates to be well-qualified professionals challenging. We designed and implemented a two-week field-intensive course as a method to address these changes and better prepare undergraduate and graduate students for careers in NR management and research. The 14 students that attended the 2006 course iteration indicated that they learned very positive things about themselves, especially their abilities to work with others and conduct fieldwork; half indicated that they would take advantage of the professional contacts they had made during the course; and the importance of people and inclusion of so many elements besides science in NR management were the most important things that most students indicated they had learned. Students will be re-queried about their experiences one year after the courses conclusion and academic performance of these students in upper-level FW classes will be compared with the performance of a group of students that did not take our course but were otherwise similar.

**PUBLICATIONS (not previously reported): 2005/09 TO 2006/09**

No publications reported this period

**PROJECT CONTACT:**

Name: Christoffel, R. A.

Phone: 517-432-4943

Fax: 517-432-1699

Email: chris317@msu.edu

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**ACCESSION NO:** 0208028 **SUBFILE:** CRIS

**PROJ NO:** MICL08393 **AGENCY:** CSREES MICL

**PROJ TYPE:** NRI COMPETITIVE GRANT **PROJ STATUS:** NEW

**CONTRACT/GRANT/AGREEMENT NO:** 2006-55204-17459 **PROPOSAL NO:** 2006-01725

**START:** 01 SEP 2006 **TERM:** 31 AUG 2009 **FY:** 2006 **GRANT YR:** 2006

**GRANT AMT:** \$231,886

**INVESTIGATOR:** Horan, R. D.; Wolf, C. A.

**PERFORMING INSTITUTION:**

Agri Economics

Michigan State University

East Lansing, Michigan 48824

# **BIOECONOMICS OF MANAGING PATHOGENS IN MULTI-HOST, LIVESTOCK-WILDLIFE SYSTEMS**

**NON-TECHNICAL SUMMARY:** The spread of infectious disease among and between wild and domesticated animals has become a major problem worldwide, threatening the economic well-being of farmers and ranchers, wildlife conservation efforts, and human health, and posing a potential threat to the safety of the American food production system. Human actions can intensify or mitigate these risks. We examine the design of strategies to sustainably manage infectious disease risks posed by livestock and wildlife systems.

**OBJECTIVES:** The purpose of this research is to improve the understanding of the economics of infectious wildlife and livestock disease prevention and management. This goal will be accomplished by incorporating recent ecological developments on multi-host species-pathogen dynamics into a bioeconomic modeling framework. Bioeconomic models can be used to understand how ecological and economic factors jointly determine how livestock production systems, wildlife ecosystems, and human activities interact in affecting disease transmission risks among and between species, and also the economic outcomes of these risks. These models can be used to gauge economic-ecological tradeoffs that are useful in developing prevention, control, and mitigation strategies, and for assessing the economic and ecological implications of the disease and the associated human responses. Specific research questions that will be addressed include 1. How do economic and ecological feedbacks between wildlife hosts and livestock and human systems matter? 2. What is the appropriate allocation of economic resources (e.g., ex ante vs. ex post, on-farm vs. off-farm) to deal with multi-host disease problems? 3. How do the answers to these questions differ for different types of disease systems, including bTB in Michigan white-tailed deer and cattle, and brucellosis (*Brucella abortus*) in Wyoming bison, elk, and cattle. Developing this knowledge will ultimately lead to more efficient and sustainable livestock production and wildlife systems, as disease management is ultimately an economic problem of how to allocate finite resources to manage infection risks.

**APPROACH:** Our research approach will address research questions 1-3 (from OBJECTIVES) through the conceptual development and numerical application of dynamic bioeconomic models to the problem of wildlife-livestock diseases. A bioeconomic model is an economic decision model that takes into account the ecological impacts of economic choices, thereby modeling the endogenous feedbacks between economic and ecological systems. This approach is novel because ecological models of multi-host-pathogen systems are relatively new and have not yet been incorporated into a bioeconomic framework. There will be two inter-related components applied to each research question. The first is the development of conceptual models to investigate theoretical results related to economic and ecological tradeoffs associated with the management of multi-host systems. The second will be the development and application of numerical simulations that can lend additional insight into the management problem, as we expect many theoretical results will depend on the specific details of particular problems. These models will be applied to the cases of bovine tuberculosis in Michigan white-tailed deer and cattle, and brucellosis in Wyoming bison, elk, and cattle.

## **PROJECT CONTACT:**

Name: Horan, R. D.  
Phone: 517-355-1301  
Fax: 517-432-1800  
Email: horan@msu.edu

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**ACCESSION NO:** 0098315 **SUBFILE:** CRIS  
**PROJ NO:** MINV-65-006 **AGENCY:** CSVM MINV  
**PROJ TYPE:** STATE **PROJ STATUS:** EXTENDED  
**START:** 01 OCT 1983 **TERM:** 30 JUN 2008 **FY:** 2006

**INVESTIGATOR:** Collins, J. E.; Goyal, S.

## **PERFORMING INSTITUTION:**

Veterinary Diagnostic Medicine  
University of Minnesota

## ANIMAL DISEASE DIAGNOSTIC LABORATORY

**OBJECTIVES:** Provide laboratory diagnostic service to poultry and livestock producers and veterinary practitioners for State of Minnesota, conduct preliminary investigations and initiate minor research on new animal disease problems, develop improved diagnostic procedures for selected disease problems.

**APPROACH:** Case histories and diagnostic laboratory data will be recorded for each case presented. Appropriate laboratory procedures will be employed for each case or specimen. Field diagnostic investigations will be made for animal disease problems as necessary. Efforts will be made to improve existing diagnostic laboratory procedures through minor research studies and new diagnostic procedures will be utilized when developed.

### **PROGRESS:** 2006/01 TO 2006/12

The number of cases submitted to the Minnesota Veterinary Diagnostic Laboratory (MVDL) increased from 66,801 in 2005 to 69,123 in 2006. The number of procedures also increased from 1,364,618 in 2005 to 1,474,680 in 2006. Paratuberculosis (Johne's disease), bovine viral diarrhea, and enteritis by rotavirus, coronavirus, and *Salmonella* were the major problems. Tuberculosis was also detected in five Minnesota beef herds and one wild white-tailed deer. In pigs the major problems were caused by porcine reproductive and respiratory syndrome virus (PRRSV), porcine circovirus, and swine influenza virus. Avian pneumovirus continues to be a problem for the turkey industry. Fewer Minnesota deer were tested for chronic wasting disease this year because no cases of this disease were found in the last 4 years of testing.

### **IMPACT:** 2006/01 TO 2006/12

The Veterinary Diagnostic Laboratory plays an important role in protecting the health of animals as well as to protect the public from food borne and zoonotic diseases.

### **PUBLICATIONS (not previously reported):** 2006/01 TO 2006/12

1. Goyal, S.M. (Ed.). 2006. Viruses in Foods. Springer, New York, NY, 345 pp.
2. Tiwari, A., Patnayak, D.P., and Goyal, S.M. 2006. Attempts to improve on a challenge model for subtype C avian pneumovirus. Avian Pathol. 35:117-121.
3. Patnayak, D.P., and Goyal, S.M. 2006. Duration of immunity engendered by a single dose of cold adapted strain of avian pneumovirus. Can. J. Vet. Res. 70:65-67.
4. Allwood, P.B., Malik, Y.S., Maherchandani, S., Hedberg, C.W., and Goyal, S.M. 2006. Effect of temperature on the survival of F-specific RNA coliphage, feline calicivirus, and Escherichia coli in chlorinated water. Int. J. Environ. Res. Publ. Hlth. 2:442-446.
5. Clay, S., Maherchandani, S., Malik, Y.S., and Goyal, S.M. 2006. Survival on uncommon fomites of feline calicivirus, a surrogate of noroviruses. Am. J. Infect. Control. 34:41-43.
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Metzger, L., Fetrow, J., Wells, S., and Chester-Jones, H. 2006. Heat-Treatment of Bovine Colostrum II: Effects of Heating Duration on Pathogen Viability and Immunoglobulin G. *J. Dairy Sci.* 89:3476-3483.

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**ACCESSION NO:** 0403282 **SUBFILE:** CRIS  
**PROJ NO:** 1940-32000-039-05S **AGENCY:** ARS 1940  
**PROJ TYPE:** USDA COOPERATIVE AGREEMENT **PROJ STATUS:** TERMINATED  
**CONTRACT/GRANT/AGREEMENT NO:** 58-1940-0-008  
**START:** 01 MAR 2000 **TERM:** 28 FEB 2005 **FY:** 2001 **GRANT YR:** 2000  
**GRANT AMT:** \$1,266,886

**INVESTIGATOR:** Rock D L; McIntosh M; Riley L

**PERFORMING INSTITUTION:**  
University of Missouri  
Columbia, Missouri 65211

**PROGRAM FOR PREVENTION OF ANIMAL INFECTIONS AND ADVANCED TECHNOLOGIES FOR VACCINES AND DIAGNOSTICS**

**OBJECTIVES:** (1) To identify and characterize vaccine targets for important viral and bacterial pathogens of livestock; (2) To identify and characterize important factors involved in optimizing host responses to intracellular and extracellular pathogens of livestock; and (3) To perform epidemiologic and other surveys sufficient to identify and design enhanced diagnostic capabilities for economically important pathogens of livestock.

**APPROACH:** Conduct collaborative research on development of vaccine materials and diagnostics for economically important pathogens of livestock.

**PROGRESS:** 2000/03 TO 2005/02

1. What major problem or issue is being resolved and how are you resolving it (summarize project aims and objectives)? How serious is the problem? What does it matter? The infectious agents under study cause significant production losses to domestic food animals and include agents of foreign animal diseases that threaten a key segment of

the agricultural economy. Mycoplasmas, mycobacteria, PRRSV and other viruses, and nematodes cause serious animal health problems in the United States and around the world. In some cases, these agents may also pose a significant health risk to humans. The economic impact of these agents to domestic producers exceeds 100 million dollars per annum. Strategies for selective detection and vaccine protection are hampered by a lack of understanding regarding the infectious strategies, genetic diversity and the immunological properties of these agents. We are developing strategies for improved diagnostics and vaccine approaches to meet this challenge. These projects were defined by relevant infectious disease and animal immunology expertise at the University of Missouri, in collaboration with scientists at the Plum Island Animal Disease Center and the Center for Excellence in Vaccine Research at the University of Connecticut.

2. List the milestones (indicators of progress) from your Project Plan. Year 1 (1999-2000) 1. Collaborations were formed and agreements put in place for a three way consortium (USDA-ARS, University of Missouri, and University of Connecticut) to address problems in foreign and domestic animal diseases, both in the design and development of new and improved vaccines as well as diagnostic tests. 2. Collaborators were actively engaged for sequencing the genomes of the mycoplasma pathogens of interest to all groups. 3. SCID-bovine mouse model used for trial of DNA vaccines for bovine tuberculosis. 4. Linkages were developed with USDA-ARS at both Plum Island and NADC for reagent and technique development and animal studies to begin testing new materials and approaches. DNA vaccine study extended to cattle. Year 2 (2000-2001) 5. Project was initiated for sequencing genome of model organism from the mycoides cluster, *Mycoplasma capricolum* subspecies *capricolum*. DNA libraries made and contracted with Institute for Systems Biology (ISB) in Seattle for primary sequence determination. 6. Studies in heterochimeric SCID-bovine mice completed and demonstrated efficacy of materials and approach. 7. Full-length PRRSV clone constructed and expressed RNA transfected into tissue culture cells and subsequently inoculated into naïve pigs. Fully infectious virus was not recovered however. Year 3 (2001-2002) 8. Completion of >80% of genome sequence of *M. capricolum* subsp *capricolum*, a critical model organism representing a cluster of ruminant pathogens with similar genetic origins; computer and human annotation underway 9. Identification of multiple gene families encoding variable surface proteins of significance to mycoplasma pathogenesis and immune evasion 10. In comparison with data from the foreign threat agent MmySC, identification of refined DNA-based targets for species differentiation and of distinctive patterns of mobile genetic elements that might confound DNA-based diagnostic efforts 11. Studies initiated with NADC-TB unit to evaluate DNA-based constructs for bovine TB constructs in cattle. 12. Alternative strategies for PRRSV infectious clone developed; transfection produced visible cytopathic effects indicating infectious particles. Deletion strategy developed to identify key regions of genome involved in cytopathic effects. Year 4 (2002-2003) 13. Completed genome sequence of *M. capricolum* subsp *capricolum* strain Kid. Computational and human annotation was in full swing. Gained access through collaborators to the still unpublished genome sequence of *M. mycoides* subsp *mycoides* SC, a foreign threat agent pathogen of cattle. This first preliminary view of a genomic framework for the closely related *M. mycoides* cluster of bovine and caprine mycoplasma species revealed genomic similarities at multiple levels and underscored the need for detailed comparisons of the genomes from multiple species in this cluster, along with selective other mycoplasmal pathogens, particularly those of cattle. 14. Identified antigen targets in mycoides cluster of mycoplasmas, and in swine pathogenic mycoplasmas, for prototype development of FRET-based platform for biological sensors (in collaboration with faculty in MU Bioengineering). 15. Initiated sequence analysis of bovine pathogen *Mycoplasma bovis*. DNA libraries prepared and sequence contracted to TIGR. 16. Initial trials were completed to evaluate costimulatory molecules as a means to enhance the development of memory and effector cytolytic T cells in cattle. An aerosol challenge model with *Mycobacterium bovis* was used to determine the potential of this approach using a subunit DNA vaccine platform. Initial studies demonstrated reduced pathology in costimulatory molecule treated animals. Additional studies began to evaluate the effector pathways involved in direct killing of intracellular mycobacteria. Granulysin and perforin homologs were identified for the bovine. 17. Initiated discovery project using RNA interference for in vivo sterilization of the parasitic nematode *Ascaris* and prevent infection of swine. Target genes identified and proof of concept established using the nonpathogenic surrogate *C. elegans*. 18. Initiated 2 additional discovery projects to characterize viral pathogenicity of porcine Circovirus 2 and viral latency of bovine herpes virus infection of cattle. Year 5 (2003-2004) 19. Computer and human annotation of *M. capricolum* subsp *capricolum* strain Kid essentially finished and sequence prepared for public release. MmySC sequence from European collaborators was publicly released and published (<http://www.genome.org/cgi/content/full/14/2/221>). 20. Comparative genomics identified DNA and antigen targets for diagnostic reagent development for the mycoides cluster of pathogens. Continued development of immobilized FRET biosensor to detect mycoplasmas. 21. *Mycoplasma bovis* DNA sequence close to completion; computer and human annotation begun a. <http://www.tigr.org/tdb/mdb/mdbinprogress.html>. b. [http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=genomeprj&cmd=Retrieve&dopt=Overview&list\\_uids=12525](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=genomeprj&cmd=Retrieve&dopt=Overview&list_uids=12525) 22.

Initiated work on sequencing project for Gladysdale strain of MmySC; DNA to be isolated at Plum Island by MU investigators; sequence acquisition contracted with TIGR. 23. *Mycobacterium bovis* DNA-based vaccine in cattle project curtailed because the principle scientist moved to UTMB in Galveston. Future collaborations on this and related project will be sought. 24. Chimeric PRRS viruses constructed between gene fragments of virulent and attenuated strains to define regions important to virulence. Growth studies were identical and a candidate region was identified that produced reduced numbers and severity of lung lesions. This region is target for additional studies. Quantitative RT-PCR methods developed for virus detection. 25. RNAi effective in sterilizing model nematodes and target genes established for the swine parasite *Ascaris*. Next step is to move this technology to clinical trials with infected animals. 26. Porcine Circovirus was characterized for expression of viral RNAs and the role of nonstructural proteins in viral growth and pathogenesis. 27. Transgenic mice constructed expressing BHV-1 transcriptional regulators. Neurons expressing these regulators differentially express viral proteins; viral reactivation studies underway. 28. New discovery project initiated to mutate surface protein genes in *Francisella tularensis* and assess role in cytoadherence and pathogenesis of tularemia. 3a List the milestones that were scheduled to be addressed in FY 2005. For each milestone, indicate the status: fully met, substantially met, or not met. If not met, why. 1. Sequencing analysis of pathogenic mycoplasma strains and identification of specific nucleic acid and protein targets for the further development of diagnostic reagents. Milestone Substantially Met 2. Demonstrated efficacy of materials and approach to DNA-based vaccines and immunostimulatory molecules for tuberculosis in cattle. Milestone Substantially Met 3. Identification and characterization of PRRSV genomic determinants for viral pathogenesis and as diagnostic reagents. Milestone Substantially Met 3b List the milestones that you expect to address over the next 3 years (FY 2006, 2007, and 2008). What do you expect to accomplish, year by year, over the next 3 years under each milestone? This agreement has come to an end and has been replaced with a new agreement (58-1949-5-519), Project Number 58-1940-32000-039-08S. This project continues many of the milestones initiated under the previous agreement and establishes the following objectives for the FY 2005 and FY 2006 funding periods. 4a What was the single most significant accomplishment this past year? The single most important accomplishment during FY 2005 was the identification and characterization of PRRSV genomic determinants for viral pathogenesis and as diagnostic reagents. 4d Progress report. Computer and human annotation of *M. capriocolum* subsp *capriocolum* strain Kid was essentially finished and sequence was prepared for public release. The MmySC sequence from European collaborators was publicly released and published. The comparative genomics identified DNA and antigen targets for diagnostic reagent development for the mycoides cluster of pathogens. Development continued of the immobilized FRET biosensor to detect mycoplasmas. *Mycoplasma bovis* DNA sequence is close to completion and computer and human annotation has begun. Work was initiated on the sequencing project for Gladysdale strain of MmySC; DNA to be isolated at PIADC; and sequence acquisition contracted with TIGR. *Mycobacterium bovis* DNA-based vaccine in cattle project has been curtailed as PI moved. Future collaborations on this and related project will be sought. Chimeric PRRS viruses were constructed between gene fragments of virulent and attenuated strains to define regions important to virulence. Growth studies were identical and a candidate region was identified that produced reduced numbers and severity of lung lesions. This region is targeted for additional studies. Quantitative RT-PCR methods were developed for virus detection. RNAi effective in sterilizing model nematodes and target genes were established for the swine parasite *Ascaris*. The next step is to move this technology to clinical trials with infected animals. Porcine Circovirus was characterized for expression of viral RNAs and the role of nonstructural proteins in viral growth and pathogenesis. Transgenic mice were constructed expressing BHV-1 transcriptional regulators. Neurons expressing these regulators differentially express viral proteins; viral reactivation studies are underway. A new discovery project was also initiated to mutate surface protein genes in *Francisella tularensis* and assess role in cytoadherence and pathogenesis of tularemia. 5. Describe the major accomplishments over the life of the project, including their predicted or actual impact. The major accomplishment of this project is the demonstration of the efficacy of materials and approach to DNA-based vaccines and immunostimulatory molecules for tuberculosis in cattle.

**PUBLICATIONS (not previously reported):** 2000/03 TO 2005/02

Carter D.B., Lai, L., Park, K.W., Samuel, M., Lattimer, J.C., Jordan, K.R., Estes, D.M., Besch-Williford, C., Prather, R.S. Phenotyping of transgenic cloned pigs. Cloning and Stem Cells. 2002. v. 4. p. 131-145.

**ACCESSION NO:** 0193834 **SUBFILE:** CRIS

**PRKQJ NO:** MOV-4-FF31 **AGENCY:** CSREES MO.V

**PROJ TYPE:** ANIMAL HEALTH **PROJ STATUS:** TERMINATED  
**START:** 01 OCT 2002 **TERM:** 30 SEP 2004 **FY:** 2003

**INVESTIGATOR:** Estes, D. M.

**PERFORMING INSTITUTION:**

Veterinary Pathology  
University Of Missouri  
Columbia, Missouri 65211

**CHARACTERIZATION OF THE CYTOLYTIC ACTIVITY OF GAMMA DELTA T LYMPHOCYTES**

**NON-TECHNICAL SUMMARY:** The organism that causes bovine tuberculosis (*Mycobacterium bovis*) presents a significant biosecurity risk to the US cattle industry and can also cause tuberculosis in humans. The objective of the proposed research is to study a cell type that may have a very important role for helping the immune system fight disease caused by tuberculosis. The gamma delta T lymphocyte is an immune cell that can kill cells that are infected with *Mycobacterium bovis*. Identifying the molecules that gamma delta T lymphocytes use to kill *Mycobacterium bovis* infected cells is the focus of the proposed research.

**OBJECTIVES:** To characterize the cytotoxic mechanisms that bovine gamma delta T lymphocytes use to kill cells infected with *Mycobacterium bovis* (*M. bovis*). The specific goals are to identify cytolytic proteins produced by gamma delta T cells after exposure to *M. bovis* infected cells, and to demonstrate production of these proteins in forming a mycobacterium granuloma.

**APPROACH:** Production of cytolytic proteins by gamma delta T lymphocytes will initially be determined in vitro. Peripheral blood mononuclear cells will be collected from a healthy bovine donor. Gamma delta T cells will be separated from the blood sample using magnetically labeled antibody and exposed to bovine macrophages that have been infected with *Mycobacterium bovis* (*M. bovis*). Total cell lysates will be collected from the gamma delta T lymphocytes following exposure to the infected macrophages and electrophoresed in a polyacrylamide gel. Western blotting will be performed on the separated proteins to determine the production of cytolytic molecules as a result of *M. bovis* exposure. The ability of gamma delta T lymphocytes to induce apoptosis in macrophages infected with *M. bovis* will also be determined using a commercially available kit for detection of cell apoptosis and death. To determine the tissue localization of cytolytic gamma delta T lymphocytes during infection, scid-bo mice will be infected with a virulent strain of *M. bovis*. The scid-bo mice will be generated by engrafting scid/beige mice with fetal bovine tissue, and thus reconstituting the mice with a bovine immune system. Tissues will be collected following infection and fixed in formalin. The location of cells producing cytolytic proteins, relative to *M. bovis* granulomas, will be determined using immunohistochemistry. The phenotype of T cells in the *M. bovis* granuloma will also be determined using immunohistochemistry. The location of cells infected with *M. bovis* in infected tissues will be determined using the Ziehl-Nielson technique for visualization of acid fast bacilli.

**PROGRESS:** 2002/10 TO 2004/09

Completed analysis of cytotoxic protein expression in *M. bovis* granulomas from infected animals and determined the effect of depleting the WC1+ gamma/sigma T cell population on expression of these proteins. Left MU; appointment at University of Texas Medical Branch, Department of Pediatrics.

**IMPACT:** 2002/10 TO 2004/09

These cells comprise a major portion of the T cell population in ruminants yet their functions are largely uncharacterized. On completion of this series of studies, we will have a much greater insight into their direct antimicrobial activities.

**PUBLICATIONS (not previously reported):** 2002/10 TO 2004/09

No publications reported this period

**PROJECT CONTACT:**

Name: Estes, D. M.

Phone: 573-882-1385  
Email: estesd@missouri.edu

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**ACCESSION NO:** 0192602 **SUBFILE:** CRIS  
**PROJ NO:** MOV-NRI **ENDSLEY AGENCY:** CSREES MO.V  
**PROJ TYPE:** NRI COMPETITIVE GRANT **PROJ STATUS:** TERMINATED  
**CONTRACT/GRANT/AGREEMENT NO:** 2002-35204-12307 **PROPOSAL NO:** 2002-02183  
**START:** 01 SEP 2002 **TERM:** 31 AUG 2004 **FY:** 2003 **GRANT YR:** 2002  
**GRANT AMT:** \$90,000

**INVESTIGATOR:** Endsley, J.; Estes, D.

**PERFORMING INSTITUTION:**

Veterinary Pathology  
University Of Missouri  
Columbia, Missouri 65211

**CHARACTERIZATION OF THE CYTOLYTIC ACTIVITY OF GAMMA DELTA T LYMPHOCYTES**

**NON-TECHNICAL SUMMARY:** The organism that causes bovine tuberculosis (*Mycobacterium bovis*) presents a significant biosecurity risk to the US cattle industry and can also cause tuberculosis in humans. The objective of the proposed research is to study a cell type that may have a very important role for helping the immune system fight disease caused by tuberculosis. The immune system is composed of many different cells and molecules that protect the body against infection by microorganisms. While the importance of many different immune cell types is known, the means used by these cells to protect against infection is not completely understood. The knowledge gained by characterizing the mechanism these cell types use to fight disease may greatly advance the development of protective vaccines. The gamma delta T lymphocyte is an immune cell that can kill cells that are infected with *Mycobacterium bovis*. Identifying the molecules that gamma delta T lymphocytes use to kill *Mycobacterium bovis* infected cells is the focus of the proposed research. Gamma delta T lymphocytes will be taken from a cow blood sample and allowed to interact with *Mycobacterium bovis* infected cells in an artificial environment. The molecules produced by the gamma delta T lymphocytes in response to the infected cell will be identified. Tissues from infected animals will then be examined to determine if production of these molecules by gamma delta T lymphocytes prevents the spread of disease. This information is very important for designing vaccines that activate immune cells with a primary role in preventing tuberculosis.

**OBJECTIVES:** The overall objective of the proposed research is to characterize the cytotoxic mechanisms that bovine gamma delta T lymphocytes use to kill cells infected with *Mycobacterium bovis* (*M. bovis*). The specific goals are to identify cytolytic proteins produced by gamma delta T cells after exposure to *M. bovis* infected cells, and to demonstrate production of these proteins in a forming mycobacterium granuloma.

**APPROACH:** The production of cytolytic proteins by gamma delta T lymphocytes will initially be determined in vitro. Peripheral blood mononuclear cells will be collected from a healthy bovine donor. Gamma delta T cells will be separated from the blood sample using magnetically labeled antibody and exposed to bovine macrophages that have been infected with *Mycobacterium bovis* (*M. bovis*). Total cell lysates will be collected from the gamma delta T lymphocytes following exposure to the infected macrophages and electrophoresed in a polyacrylamide gel. Western blotting will be performed on the separated proteins to determine the production of cytolytic molecules as a result of *M. bovis* exposure. The ability of gamma delta T lymphocytes to induce apoptosis in macrophages infected with *M. bovis* will also be determined using a commercially available kit for detection of cell apoptosis and death. To determine the tissue localization of cytolytic gamma delta T lymphocytes during infection, scid-bo mice will be infected with a virulent strain of *M. bovis*. The scid-bo mice will be generated by engrafting scid/beige mice with fetal bovine tissue, and thus reconstituting the mice with a bovine immune system. Tissues will be collected following infection and fixed in formalin. The location of cells producing cytolytic proteins, relative to *M. bovis* granulomas, will be determined using immunohistochemistry. The phenotype of T cells in the *M. bovis* granuloma will also be determined using

immunohistochemistry. The location of cells infected with *M. bovis* in infected tissues will be determined using the Ziehl-Nielson technique for visualization of acid fast bacilli.

**PROGRESS:** 2002/09 TO 2004/08

The objective of the proposed research was to characterize the cytotoxic mechanisms of bovine WC1 gamma delta T cells against *M. bovis* infected macrophages and provide information regarding the in vivo relevance of this response during infection. To date we have used real time PCR to establish baseline kinetics of expression of cytokine genes and cytotoxic protein genes by purified WC1 gamma delta T following stimulation in culture. The expression of cytotoxic proteins by WC1 gamma delta T and WC1 gamma delta T depleted lymphocytes has also been determined. A manuscript titled Expression of Immunoregulatory Cytokines and Cytotoxic Effector Molecules by Activated gamma delta T Lymphocytes is currently being prepared for submission to the Journal of Leukocyte Biology. In order to analyze expression of cytotoxic proteins by T lymphocytes at sites of infection in *M. bovis* infected animals, we have optimized an immunohistochemistry technique for antigen retrieval of cell surface markers and cytotoxic proteins in formalin fixed tissue sections. We are currently evaluating the production of cytolytic proteins and identifying the T cell subset producing cytolytic proteins at the site of a *M. bovis* liver granuloma in the presence and absence of WC1 gamma delta T cells. A manuscript titled WC1 gamma delta T cells Indirectly Regulate Chemokine Production during Mycobacterium bovis Infection in SCID-bo Mice is in preparation for submission to the Journal of Immunology. We have also cloned a previously uncharacterized bovine cytotoxic granule protein (granulysin), established activity of this protein against gram negative and gram positive bacteria, and determined the expression of bovine granulysin in CD4 , CD8 , and WC1 gamma delta T cells. This work titled Characterization of Bovine Homologues of Granulysin and NK-lysin was published this year (J. Immunology. Aug 15;173(4):2607-14). Our laboratory has developed antibody to bovine granulysin for use in the analysis of effector mechanism used by bovine T lymphocytes in antigen specific cell mediated immune responses. Disclosure documents have been filed for the bovine molecule and antibody for subsequent patent application. Research results from this project were presented at two national meetings (American Association of Immunologists, Denver, CO 2003 and The Changing Landscape of Vaccine Development, Galveston, TX, 2004) and one international meeting (The International Veterinary Immunology Symposium, Quebec, 2004).

**IMPACT:** 2002/09 TO 2004/08

The potential for the bovine gamma delta T lymphocyte subset to express cytotoxic proteins and produce cytokines that may have roles in regulating effector activity of other T lymphocytes was characterized as a result of this research. The abundance of the gamma delta T lymphocyte subset, along with the ability to contribute to cytotoxicity against infected cells, indicates the need to consider gamma delta T cell activation when designing vaccines. The enhancement of T cell mediated immune responses by vaccine design (choice of epitope, adjuvant, etc.) is important for protecting cattle against many pathogens. The availability of effective vaccines is very relevant to reducing economic losses in the dairy and beef cattle industries and for preventing agroterrorism related food supply instability.

**PUBLICATIONS (not previously reported):** 2002/09 TO 2004/08

1. Endsley, J.J. and D. M. Estes. 2004. Expression of Immunoregulatory Cytokines and Cytotoxic Effector Molecules by Activated gamma delta T Lymphocytes. J. Leukocyte Biology. (in preparation).
2. Alvarez, A., J.J. Endsley, D. Werling, and D.M. Estes. 2004. WC1 gamma delta T Cells Indirectly Regulate Chemokine Production During *Mycobacterium bovis* Infection in SCID-bo Mice. J. Immunology. (in preparation).
3. Endsley, J.J. , J.L. Furrer, M.A. Endsley, M.A. McIntosh, A.C. Maue, W.R. Waters, D.R. Lee, and D. M. Estes. 2004. Characterization of Bovine Homologues of Granulysin and NK-lysin. J. Immunology. Aug 15;173(4):2607-14.

**PROJECT CONTACT:**

Name: Endsley, J.  
Phone: 573-884-8966  
Fax: 573-884-5414  
Email: endsleyj@missouri.edu

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**ACCESSION NO:** 0194275 **SUBFILE:** CRIS

**PROJ NO:** MONB00032 **AGENCY:** CSREES MONB

**PROJ TYPE:** ANIMAL HEALTH **PROJ STATUS:** TERMINATED

**START:** 01 OCT 2002 **TERM:** 30 SEP 2006 **FY:** 2005

**INVESTIGATOR:** Quinn, M. T.

**PERFORMING INSTITUTION:**

Veterinary Molecular Biology  
Montana State University  
Bozeman, Montana 59717

**ANALYSIS OF BISON INNATE DEFENSE AGAINST MICROBIAL PATHOGENS**

**NON-TECHNICAL SUMMARY:** The American Bison (*Bison bison*) is a wild/semi-domesticated ruminant that encounters serious infectious diseases, such as tuberculosis and brucellosis. This project studies the types of antimicrobial proteins present in bison neutrophils and how active they are against several relevant pathogens. A better understanding of these proteins could potentially lead to practical applications to controlling infectious disease in bison and other wildlife.

**OBJECTIVES:** We hypothesize that bison neutrophils contain mobilizable proteins, which have direct antimicrobial properties with therapeutic potential against persistent bison diseases such as tuberculosis. To address this hypothesis, we propose the following aims: 1) Characterize biochemically and functionally the types of antibacterial proteins present in bison neutrophils and 2) Probe for and clone selected bison neutrophil antimicrobial proteins.

**APPROACH:** Objective 1 will require the collection of blood from captive bison and further isolation and purification of neutrophils. We will then use one or more procedures to extract a subset of proteins, which is likely to contain neutrophil antimicrobial proteins (AMPs), as determined by bacterial killing assays. Finally, we will systematically screen the proteins we have extracted, for killing activity against *E. coli*, *S. aureus*, and *M. bovis* BCG. Following completion of objective 1, we hope to have identified one or more proteins that have interesting antimicrobial activity; we then propose to find and clone the gene(s) for these proteins, so that they can be produced as recombinant proteins for further detailed mechanistic and microbiological testing. One possibility is that the protein of interest is one of the bison batenecins, which we have already begun to characterize, and we will continue cloning these genes as described below. If the protein does not appear to be one of the batenecins, we will use N-terminal sequencing to obtain sufficient code to design primers for further sequencing/cloning.

**PROGRESS:** 2002/10 TO 2006/09

Bison can become infected with bacteria that linger as intracellular parasites, where they are sheltered from neutrophil defenses. This project studied the types of antimicrobial proteins and processes present in bison neutrophils and how active they are against several relevant pathogens. A protein of interest, one of the bison batenecins, has been characterized and sequencing/cloning efforts are underway. Bison neutrophil granule extracts were found to have potent killing activity against *E. coli*. Conversely, the neutrophil extracts did not kill *S. aureus* and, in fact, had a permissive effect. Analysis of the extracts showed that the granules possessed many low molecular weight proteins. Further analysis showed that bovine and bison neutrophil granule proteins may have differences in molecular weight, which may or may not translate to functional differences. In addition to these antimicrobial proteins, bison neutrophils also possess a number of microbicidal functions. Since not much is known about the system responsible for oxidant production in bison (the NADPH oxidase), we characterized this bison neutrophil function and found unique differences that may allow bison to respond to the distinct host defense challenges that they encounter. We also cloned and sequenced the genes for six bison NADPH oxidase components. When compared to other species, the bison proteins were most similar to those of bovine, but were less similar to those of the other species. Overall, these studies show that the bison and bovine NADPH oxidase genes are highly conserved between these two species, despite their divergence from a common ancestor over 1 million years ago. Extension of this work into understanding the role of neutrophil function in brucella infection could potentially lead to better ways to control the spread of Brucellosis from bison to cattle.

**IMPACT:** 2002/10 TO 2006/09

Bison can become infected with bacteria that linger as intracellular parasites, where they are sheltered from neutrophil defenses. This project studies the types of antimicrobial proteins present in bison neutrophils and how active they are

against several relevant pathogens. A better understanding of these proteins could potentially lead to practical applications to controlling infectious disease in bison and other wildlife.

**PUBLICATIONS (not previously reported):** 2002/10 TO 2006/09

No publications reported this period

**PROJECT CONTACT:**

Name: Quinn, M. T.

Phone: 406-994-5721

Fax: 406-994-4303

Email: mquinn@montana.edu

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**ACCESSION NO:** 0404496 **SUBFILE:** CRIS

**PROJ NO:** 5438-32000-023-00D **AGENCY:** ARS 5438

**PROJ TYPE:** USDA INHOUSE **PROJ STATUS:** NEW

**START:** 17 NOV 2001 **TERM:** 16 NOV 2006 **FY:** 2006

**INVESTIGATOR:** Heaton M P; Clawson M L; Harhay G P; Chitko Mckown C G; Laegreid W W

**PERFORMING INSTITUTION:**

Agricultural Research Service

Clay Center, Nebraska 68933

**GENETIC PREDISPOSITION OF LIVESTOCK TO INFECTION BY MUCOSAL PATHOGENS**

**OBJECTIVES:** 1) Identify nucleotide sequence variation in host genes that play a fundamental role in the infection process and 2) identify DNA sequences that are associated with susceptibility or resistance to infectious disease, 3) provide a secure, well-annotated database of nucleotide sequence data, and associated biological data, of relevant viral pathogens affecting livestock.

**APPROACH:** Infectious diseases in livestock are a significant source of economic loss and represent a potential risk to human health. Improvements in herd health and food safety may result, for example, if individuals with the highest risk for infectious disease are eliminated from the production cycle. The ultimate goal of functional genomics with regard to animal health is to read an animal's DNA sequence and estimate its risk of acquiring or maintaining infections. Before this can be accomplished, there are two key issues to address: 1) the identification of nucleotide sequence variation in host genes that play a fundamental role in the infection process and 2) the identification of DNA sequences that are associated with susceptibility of resistance to infectious disease. This project is designed to address these issues in commercial populations of livestock. As these objectives are achieved for selected candidate genes, new information and technology will be developed that will facilitate reading an animal's DNA sequence for estimating its risk of acquiring or maintaining infections. In addition a database containing a set of well-annotated genomic sequences of viral pathogens currently on the threat list, and sequences of known pathogens that produce disease similar to those caused by threat list agents. Beyond providing the basis for analysis of pathogen isolates, this high quality core of reference sequences will enable the discovery of association between pathogen sequence and phenotypes on a scale not yet approached in livestock infectious disease research.

**PROGRESS:** 2005/10 TO 2006/09

Progress Report 1. What major problem or issue is being resolved and how are you resolving it (summarize project aims and objectives)? How serious is the problem? Why does it matter? Infectious diseases in livestock are a significant source of economic loss and represent a potential risk to human health. Improvements in herd health and food safety may result if animals with the highest risk for infectious disease are eliminated from the production cycle. The ultimate goal of this project is to read an animal's DNA sequence (genotype) and estimate its risk of acquiring or maintaining infections. This requires the identification of host genes and DNA sequence variation associated with infectious diseases in livestock. Important outcomes of this research are accurate and economical genetic tests that are accessible by managers of U.S. livestock populations. In cattle, the total number of death losses from respiratory and digestive

diseases is about 2 million animals per year and cost about \$800 million. Although these figures include non-infectious diseases, it is acknowledged that many (if not most) are caused by infectious agents. With regard to human health, the top six foodborne bacterial pathogens are estimated to cost about \$5 billion annually due to illness. Lastly, reducing the impact of infectious agents is important in maintaining consumer confidence through all phases of production and has significant effects on domestic and export markets for fresh meat. In lost beef export markets alone, the economic impact of the Washington State bovine spongiform encephalopathy (BSE) case announced December 23, 2003, was estimated to be between \$3.2 and \$4.7 billion in revenue loss to the U.S. beef industry in the first year alone. This research addresses several goals of the National Program 103 Action Plan for Animal Health including: genetic resistance to disease, epidemiology of disease, and strategies to control infectious and non-infectious diseases.

2. List by year the currently approved milestones (indicators of research progress) There are two objectives in the Project Plan: 1) discover DNA sequence differences in livestock and 2) evaluate these alleles for association with infectious disease. Milestones from Objective 1 in the Project Plan: FY 2001: Develop a DNA-based test for disease traceback in beef cattle. FY 2001: Identify DNA sequence variation for the bovine neonatal Fc receptor, e.g. the IgG alpha chain transporter (FCGRT). FY 2002: Adapt the traceback test for parentage determination in beef cattle. FY 2005: Identify DNA sequence variation in the bovine beta-2-microglobulin (B2M) gene. FY 2005: Identify DNA sequence variation in other disease-related genes. FY 2006: Collect case-control material for ovine progressive pneumonia (OPP) in sheep. FY 2006: Identify 75 new single nucleotide polymorphisms (SNPs)(200 total). FY 2006: Complete the sequence analysis for a 25-kb bovine prion gene region in 192 animals representative of U.S. beef and dairy populations. FY 2006: Identify 60 additional DNA markers for disease traceback in North American beef and dairy populations. Milestones from Objective 2 in the Project Plan: FY 2003: Assemble diverse germplasm for U.S. sheep populations. FY 2004: Evaluate FCGRT alleles for association with failure of passive transfer (FPT) phenotype in neonatal calves. FY 2005: Evaluate B2M alleles for association with FPT in neonatal calves. FY 2005: Assemble USMARC case-control material for OPP in sheep. FY 2005: Identify new DNA-markers for disease traceback in beef and dairy populations. FY 2006: Risk factor analysis for OPP in sheep.

4a List the single most significant research accomplishment during FY 2006. Discovery of new genetic variation in the bovine prion gene: Bovine spongiform encephalopathy (BSE) is a fatal neurological disorder characterized by abnormal deposits of a protease resistant isoform of the prion protein. Characterizing the bovine prion gene is important for understanding its role in BSE susceptibility. Our aim was to sequence a 25.2-kb genomic region containing the prion gene in 192 diverse U.S. beef and dairy cattle. Sequence analyses identified 388 total DNA differences in cattle, of which 287 have not previously been reported. This number of DNA sequence differences in the prion gene region of U.S. cattle is nearly four times greater than all the previously described differences combined. Our research defined the patterns of DNA differences that may influence BSE susceptibility in cattle.

4b List other significant research accomplishment(s), if any. Discovery of new genetic types of scrapie susceptibility: Genetic variation within the ovine prion gene of domestic sheep is associated with predisposition to scrapie, a transmissible spongiform encephalopathy disease of sheep. We identified a new pattern of DNA differences associated with scrapie susceptibility. The chromosomal DNA sequence encoding scrapie-susceptible "ARQ" type, was further subdivided into nine different classes. The existence of multiple classes of the "ARQ" type raises the question of whether sheep bearing these different versions of the prion gene are equally susceptible to scrapie. The results are important for a higher resolution analysis of genetic contributions to scrapie susceptibility. Traceback of a tuberculosis-positive steer: At the request of APHIS, we used gender-specific DNA markers to confirm the identity of a male tuberculosis-positive animal from a cohort of otherwise female bovine DNA samples. Our laboratory was able to report conclusive results to APHIS within 24 hours of receiving the samples. Assays for the markers were developed in our lab and are described in peer-reviewed scientific publications.

4d Progress report. Major accomplishment during FY 2006: In cattle, the second set of 30 highly-informative SNPs in U.S. beef and dairy populations are publicly available in GenBank. This represents 60 total files viewable at GenBank from our project entitled "A single nucleotide polymorphism (SNP) marker set for DNA-based traceback in North American beef and dairy cattle." The target SNPs have an average minor allele frequency of 0.424 (beef) and 0.433 (dairy) in diverse groups of U.S. cattle. In this set of 60 files, we have identified and annotated 847 flanking polymorphisms (important for assay designs) from 64,107 total bp sequenced through each of 216 diverse beef and dairy cattle. This amounts to 539,038 total bp of annotated sequence including: 127 amplicons, 110 exons, 92 CDSs, and 854 bovine repetitive elements. With the 60 highly-informative markers, the average probability that the genotypes from two unrelated individuals are identical by state is about  $7 \times 10^{-26}$ . The average probability of paternity exclusion to be 0.999996 and 0.9995 for all 60 SNPs with one or zero parents known, respectively. These are markers specially selected for optimum power, genome-wide distribution, accuracy in genotyping, and high-throughput "multiplexability." The target (parentage) SNP is flagged with the note: "highly polymorphic in diverse populations of U.S. beef and dairy

cattle. " An NCBI nucleotide query with "heaton & contig" at: <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Nucleotide&itool=toolbar> will retrieve these files: DQ381153, DQ451555, AY773474, DQ404150, DQ404149, AY761135, DQ404151, DQ404152, AY776154, AY841151, DQ422949, DQ786757, DQ422950, DQ647187, AY842472, AY842474, AY842473, DQ435443, DQ489377, DQ839235, DQ647186, AY842475, DQ485413, DQ647188, DQ470475, DQ500958, DQ647189, DQ468384, DQ846688, AY844963, DQ647190, DQ789028, AY849380, AY849381, DQ786758, DQ650635, DQ786759, DQ650636, AY850194, DQ837644, DQ674265, DQ846689, DQ786765, DQ786766, DQ786760, DQ786761, DQ786762, DQ837646, DQ837645, AY851162, DQ837643, AY851163, DQ786763, DQ786764, DQ832700, AY853302, AY853303, DQ846690, DQ846691, DQ846692.

5. Describe the major accomplishments to date and their predicted or actual impact. Host-pathogen expression analysis. Bacterial infections in cattle represent a potential risk to animal and human health. At USMARC, we reported the identification and mapping of two bovine genes that are expressed in response to *Escherichia coli* O157:H7 exposure. Transcripts encoding interleukin 8 (IL-8) and a novel chemokine gene (ECIP-1) were markedly elevated when measured by two independent methods. Our results were important because this family of chemokine genes became the target of subsequent genomic efforts and was the first example of mapping bovine genes with DNA sequencing--SNP technology. SNP linkage mapping is now standard practice in U.S. cattle genetics. DNA sequence diversity in bovine cytokine genes: Dissection of complex traits in commercial populations of cattle will require the ability to genotype significant numbers of animals and an abundant supply of informative DNA markers. At USMARC, we reported the first estimation of DNA sequence diversity in bovine genes and established MALDI-TOF MS as an accurate high-throughput automated genotype scoring platform for use in cattle. The average number of SNP haplotype alleles was 4.4 per 600-bp bovine PCR amplicon and these haplotypes could be correctly deduced without use of pedigree information. Our results were important because they indicated that a wide range of genetic studies in commercial populations of cattle was possible where genotypic information from relatives may not be available.

Haplotype analysis of bovine IL8 gene: Efficient use of gene-based SNP markers in commercial populations of cattle requires the identification of the majority of haplotype alleles for each gene and an estimation of the allele frequencies in relevant breeds. At USMARC, we assembled a panel of 96 sires that reflect the breadth of genetic diversity in U.S. beef cattle and reported the nucleotide sequence diversity and haplotype structures of IL-8. The five IL-8 haplotypes identified are estimated to be present in more than 98% of U.S. beef cattle. Our results were important because they showed that a diverse population sampling, combined with high-resolution tests within candidate gene regions, will provide molecular tools required for genetic epidemiology. DNA-based animal ID and parentage in beef cattle: Although SNP marker technology represents a promising means for determining the genetic identity and kinship of an animal, in cattle, the challenge has been to identify SNPs with sufficient power for use in many popular breeds and crossbred populations. At USMARC, we have described a carefully selected set of 32 SNP markers that is useful for both "fingerprinting" animals and determining paternity. The selection criteria were critical since randomly selected sets of SNP markers had little power. Our results were important because they represented the first SNP-based test for identity and paternity testing in any animal species other than human, and allowed the design of robust accurate genotype assays on a variety of economical high-throughput SNP genotyping platforms. DNA marker for failure of passive transfer (FPT), a health-related trait in cattle: Newborn calves afflicted with FPT do not possess immunoprotective maternal antibodies and they are highly prone to illness and death from infectious diseases. At USMARC, we identified the first maternal DNA marker for FPT in beef calves. A gene (FCGRT) encoding part of the neonatal immunoglobulin transfer protein (FcRn) was sequenced in populations of cattle and specific nucleotide sequence changes were associated with low or high concentrations of immunoglobulin in calves. Our results are important because they suggest a genetic component to the problem of low antibody levels in young calves, and they provide DNA markers on the dam's side for predicting FPT. This facilitates developing genetic strategies for controlling this important problem.

Washington State BSE index case: Reducing the impact of BSE is important in maintaining consumer confidence through all phases of production and has significant effects on domestic and export markets for fresh meat. At USMARC, we described novel prion gene sequence variation in U.S. cattle, sheep, and deer. These results were published in a peer-reviewed scientific journal and deposited into GenBank one month prior to the December 23, 2003, Washington State BSE index case. Our results are important because they provided a reference map of the common prion gene sequence variation present in U.S. populations. The reference variation in U.S. beef cattle was compared with that from the U.S. and Canadian BSE cases to show that the latter sequences were unremarkable. Moreover, we used our DNA-based traceback tests to verify pedigrees associated with the Washington State BSE case and, thereby, confirmed its Canadian origin.

Identification of new FPT risk factor in calves: Calves affected with FPT are at risk for morbidity and mortality from infectious disease. At USMARC, we described the association of a B2M haplotype with FPT in newborn calves. These results were published in a peer-reviewed scientific

journal and deposited into GenBank. Our results are important because FPT is a serious problem in U.S. beef cattle that can result in calf illness or death. The identification of this DNA marker may facilitate new genetic programs that reduce the prevalence of FPT in U.S. beef cattle by selective breeding programs. Developed a new DNA test for sheep scrapie susceptibility: Scrapie is a fatal, transmissible disease affecting the central nervous system of sheep and its eradication is a national priority in the U.S. and Europe. At USMARC, we developed a novel and highly accurate DNA test for scrapie susceptibility in sheep. These results were made public by deposition in GenBank. Our results are important because they facilitate accurate and efficient analysis of scrapie susceptibility in sheep. Genotyping companies are now offering this low-cost DNA test to the public as part of the National Scrapie Eradication Program. Developed new DNA markers for gender testing: Embryo transfer is widely used in the beef and dairy industries and a cornerstone of many breeding programs. Determining an embryo's sex prior to implantation may advance the rate of genetic improvement without compromising the calf's productivity. At USMARC, we described a new DNA- based gender-specific test for U.S. beef cattle. The results were published in a peer-reviewed scientific journal and deposited into GenBank. Our results are important because accurate characterization of gender from bovine cells, tissues, or embryos is essential for many beef and dairy improvement programs and for DNA traceback situations. Our results have been employed in the development of commercially available bovine sex-typing assays. DNA-based carcass tracking in slaughter plants: Accurate food animal identification is essential for improving disease control and enhancing food safety. Our study showed that a selected set of 20 beef cattle DNA markers will verify sample tracking in a large, federally inspected, Northeastern slaughter facility that primarily processes culled dairy cows. Blood was collected from random animals just prior to slaughter and the purported corresponding liver samples were collected during beef processing. DNA tests were run on each sample and the results were compared. Results showed that the chance of a coincidental genotype match between two animals was estimated to be 1 in 23 million. DNA testing confirmed the matches for more than 90% of the purported blood-liver pairs and also revealed the mismatched samples. Our results are important for two reasons: 1) these DNA markers are able to accurately match bovine carcasses to their tissues and 2) the carcass mismatch rates may be significant in slaughter plants. This has implications for food safety "test and hold" programs that rely on holding the correct carcass until a particular food safety-related test result is obtained. Developed a set of 15 PRNP genotyping controls for sheep scrapie eradication programs: As part of ongoing sheep genetic experiments at the USMARC, we have developed a genetic test for scrapie susceptibility. The details of this novel prion gene (PRNP) genotyping test have not yet been published but were made publicly available via GenBank submissions. This genotyping assay detects PRNP haplotype combinations and has been adopted by a number of genotyping companies. Collectively, these companies are conducting the majority of commercial PRNP genotyping assays conducted in the U.S. Additionally, we recognized that DNA controls for all 15 possible combinations of the five common PRNP haplotypes (ARR, ARQ, ARH, AHQ, and VRQ) are needed as a quality control check for our genotyping production runs. Moreover, several members of the PRNP genotyping community have expressed a similar need for these DNA controls. Thus, we have identified 15 USMARC sheep, each having one of these 15 genotype combinations, and created a set of 15 PRNP DNA genotyping controls. To facilitate use of these DNA controls across a variety of genotyping platforms, we have sequenced the complete PRNP coding sequence for each of the 15 genotype combinations and made them publicly available in GenBank (accession numbers AY907681-AY907694 and AY909542) and distributed the genotyping controls to APHIS and other institutions around the world. 6. What science and/or technologies have been transferred and to whom? When is the science and/or technology likely to become available to the end- user (industry, farmer, other scientists)? What are the constraints, if known, to the adoption and durability of the technology products? In total, more than 2000 SNPs have been identified, made publicly available, and transferred to more than 43 companies/institutions in more than 22 countries. Moreover, we have assisted more than a dozen commercial genotyping companies, forensic laboratories, research institutions, and universities in the adaptation of our assays to their particular genotyping platforms. The genetic tests include those for health, animal identity, parentage, gender, species, and prion diseases. 7. List your most important publications in the popular press and presentations to organizations and articles written about your work. (NOTE: List your peer reviewed publications below). "Genetics of disease resistance in sheep," American Sheep Industry Association Research Committee, November 24, 2003. "Beef cattle genomics and animal health," ARS TSE Scientific Committee/Working Group at the Annual NCBA Conference, Phoenix, AZ, January 28, 2004. "Using DNA evidence to test a pedigree: The Washington State BSE case, December 23, 2003," U.S. Meat Export Federation-European Union Meat Representatives, June 7, 2004. "TSEs touch off ARS research," Agricultural Research magazine, December 2004 issue, pp. 4-9. "The best DNA markers pennies can buy." Article written for cattle breed associations. June 2006.

**PUBLICATIONS (not previously reported): 2005/10 TO 2006/09**

1. Isler, B.J., Freking, B.A., Thallman, R.M., Heaton, M.P., Leymaster, K.A. 2006. Evaluation of associations between prion haplotypes and growth, carcass, and meat quality traits in a Dorset x Romanov sheep population. *Journal of Animal Science*. 84:783-788.
  2. Harhay, G.P., Sonstegard, T.S., Keele, J.W., Heaton, M.P., Clawson, M.L., Snelling, W.M., Wiedmann, R.T., Van Tassell, C.P., Smith, T.P. 2005. Characterization of 954 bovine full-CDS cDNA sequences. *Biomed Central (BMC) Genomics* 6:166 (11 pp).
  3. Clawson, M.L., Heaton, M.P., Keele, J.W., Smith, T.P., Laegreid, W.W. 2006. Linkage disequilibrium and haplotype structure in the prion gene of U.S. beef and dairy cattle (abstract). *Plant and Animal Genome Conference Proceedings*. p. 145.
  4. Donthu, R., Larkin, D.M., Heaton, M.P., Lewin, H.A. 2006. In silico discovery, mapping, and genotyping of 1,039 cattle SNPs on a panel of eighteen breeds [abstract]. *Plant and Animal Genome Conference Proceedings*. p. 235.
  5. Heaton, M.P., Leymaster, K.A., Clawson, M.L., Freking, B.A., Laegreid, W.W. 2006. A freely-available set of reference DNAs for genotyping the major scrapie susceptibility alleles in sheep [abstract]. *Plant and Animal Genome Conference Proceedings*. p. 239.
  6. Isler, B.J., Freking, B.A., Heaton, M.P., Thallman, R.M., Leymaster, K.A. 2005. Effects of prion haplotype on growth and carcass traits in sheep [abstract]. *Midwestern Section of the American Society of Animal Science*. 83(Suppl. 2):44-45
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**ACCESSION NO:** 0186991 **SUBFILE:** CRIS

**PROJ NO:** NYC-433333 **AGENCY:** CSREES NY.C

**PROJ TYPE:** ANIMAL HEALTH **PROJ STATUS:** TERMINATED

**START:** 01 JUN 2000 **TERM:** 30 SEP 2004 **FY:** 2004

**INVESTIGATOR:** Russell, D. G.

**PERFORMING INSTITUTION:**

Veterinarian Microbiology & Immunology  
Cornell University  
Ithaca, New York 14853

**PATHOGEN MYCOBACTERIA:** *M. TUBERCULOSIS*, *M. BOVIS*, AND *M. AVIUM*

**NON-TECHNICAL SUMMARY:** Mycobacterial species are important pathogens in both animals and humans. Study into the lifestyles of mycobacteria species pathogenic to animals and humans such as *M. tuberculosis*, *M. leprae*, *M. bovis* and *M. avium* reveals extensive parallels in their mechanisms of intracellular survival and persistence. The laboratory is devoted to the study of microbial pathogens that exploit the macrophage as their host cell.

**OBJECTIVES:** The laboratory is dedicated to the study of pathogen mycobacteria. The primary area of interests are as follows: 1. Analysis of the biology of the interaction between the macrophage and the bacillus with respect to the intracellular environment and the regulation of host cell function. 2. The elucidation of the metabolism of the intracellular bacillus and its exploitation as possible targets of drug action. 3. The appreciation of the modulation of the infection foci and the role of the granuloma in the persistence of infection.

**APPROACH:** Cell Biology of Intracellular Infections by *Mycobacterium avium*: This delicate interplay between the bacterium, and its potentially microbicidal host cell is little understood. Previous work in the laboratory has fostered the belief that, with respect to the interaction with macrophages and the immune responses at site of infection, there are many parallels between pathogenic mycobacteria species, including *Mycobacterium bovis*. For this reason emphasis is also placed on exploitation of genetic approaches available for other mycobacterial species, notably *M. tuberculosis* and *M. bovis*, for the resolution of mechanisms common to all pathogenic mycobacteria. 2. Elucidation of Intermediate Metabolism and Carbon Source Acquisition by *M. bovis* and *M. tuberculosis*: We have extensive experience in modeling intracellular infections by both prokaryote and eukaryote pathogens and propose to apply this expertise to determining the contribution of the glyoxylate shunt pathway to infection. 3. Formation and Maintenance of the Granuloma and its role in Infection by *Mycobacterium* spp: We have carried out a systematic analysis of bacterial

lipidoglycans released and trafficked through infected macrophages. These comprise 7 major species of lipids some, or all, capable of inducing granulomas in mice. The ability of these lipids to expand the influence of the bacteria beyond the infected macrophages and induce granuloma formation suggest that they play roles key to the evolution of this response. Our recent development of an in vivo model exploiting these lipids will enable the functional determination of the roles of these molecules in granuloma induction.

**PROGRESS:** 2000/06 TO 2004/09

*Mycobacterium tuberculosis* is a phenomenally successful pathogen that infects approximately a third of its host species, mankind. Its success lies in its capacity to establish and maintain its infection within the hosts phagocytes. In the short term this is achieved though arresting the normal maturation of its phagosome and blocking its fusion with acidic, hydrolytic lysosomes. We have been studying this aspect of the pathogens biology through the isolation of transposon-mutagenized bacteria defective in arresting the maturation of the phagosome. The majority of realtime assays for phagosome maturation exploit ratio fluorometry to measure the pH of the phagosome lumen. These methods provide a very sensitive assay for the first 15-20 minutes following internalization of the particle but do not provide any insights beyond the number and activity of vacuolar ATPase (V-ATPase) complexes acquired by the phagosome. Over the past year we have developed two novel realtime assays of phagosome maturation that are linked directly to the biological function of the phagosome as a degradative compartment. Importantly these assays measure independently, and with differing kinetics, processes exhibited by all phagosomes during their maturation. The first assay is a FRET-based assay for phagosome/lysosome fusion, and the second assay provides realtime analysis of the rate of degradation of a fluorogenic cysteine proteinase substrate bound to the surface of the experimental particle. The FRET-based assay for phagosome/lysosome fusion effectively measures the mixing of the phagosome with the luminal cargo of late endosomal/lysosomal compartments as a function of time. This provides a dynamic readout extending to 2 hours post-internalization. Treatment of the cells with inhibitors known to affect phagosome maturation produce profiles consistent with published reports. The proteinase assay measures the rate of hydrolysis of a synthetic cysteine proteinase substrate, (biotin-Phe-Arg)2-Rhod 110. This substrate is cleaved by cysteine proteinases, although it has been reported that this sequence is recognized preferentially by cathepsin L over cathepsin B. The kinetics of degradation shows an endpoint equilibrium reached at 17-18 minutes after which the free fluor slowly leaches out of the cell. Furthermore, combination of these assays and the pH phagosome maturation assay with inhibitors of different cellular processes demonstrate that these assays have the capacity to resolve certain key decision points in phagosome maturation. These data reveal a series of checks and balances decision points that are easy to rationalize when one considers how the phagosomal system is manipulated by different intracellular pathogens. The data are described in a manuscript we have submitted to Nature Methods.

**IMPACT:** 2000/06 TO 2004/09

Infections by *Mycobacterium* spp. continue to be a serious problem for the health of both humans and livestock. Results of these studies will provide a better understanding of the pathogen's biology through the isolation of transposon-mutagenized bacteria defective in arresting the maturation of the phagosome.

**PUBLICATIONS (not previously reported):** 2000/06 TO 2004/09

No publications reported this period

**PROJECT CONTACT:**

Name: Wood, J. R.

Phone: 607-253-3759

Fax: 607-253-3756

Email: jrw7@cornell.edu

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**ACCESSION NO :** 0187063 **SUBFILE:** CRIS

**PROJ NO:** NYCV-433338 **AGENCY:** CSREES NYCV

**PROJ TYPE:** ANIMAL HEALTH **PROJ STATUS:** EXTENDED

**START:** 01 JUN 2000 **TERM:** 30 SEP 2005 **FY:** 2005

**INVESTIGATOR:** Russell, D. G.

**PERFORMING INSTITUTION:**

Microbiology and Immunology  
Cornell University  
Ithaca, New York 14853

**PATHOGEN MYCOBACTERIA: *M. TUBERCULOSIS*, *M. BOVIS*, AND *M. AVIUM***

**NON-TECHNICAL SUMMARY:** Study into the lifestyles of mycobacteria species pathogenic to animals and humans such as *M. tuberculosis*, *M. leprae*, *M. bovis* and *M. avium* reveals extensive parallels in their mechanisms of intracellular survival and persistence. The laboratory is devoted to the study of microbial pathogens that exploit the macrophage as their host cell.

**OBJECTIVES:** The laboratory is dedicated to the study of pathogen mycobacteria. The primary area of interests are as follows: 1. Analysis of the biology of the interaction between the macrophage and the bacillus with respect to the intracellular environment and the regulation of host cell function. 2. The elucidation of the metabolism of the intracellular bacillus and its exploitation as possible targets of drug action. 3. The appreciation of the modulation of the infection foci and the role of the granuloma in the persistence of infection.

**APPROACH:** Cell Biology of Intracellular Infections by *Mycobacterium avium*: This delicate interplay between the bacterium, and its potentially microbicidal host cell is little understood. Previous work in the laboratory has fostered the belief that, with respect to the interaction with macrophages and the immune responses at site of infection, there are many parallels between pathogenic mycobacteria species, including *Mycobacterium bovis*. For this reason emphasis is also placed on exploitation of genetic approaches available for other mycobacterial species, notably *M. tuberculosis* and *M. bovis*, for the resolution of mechanisms common to all pathogenic mycobacteria. 2. Elucidation of Intermediate Metabolism and Carbon Source Acquisition by *M. bovis* and *M. tuberculosis*: We have extensive experience in modelling intracellular infections by both prokaryote and eukaryote pathogens and propose to apply this expertise to determining the contribution of the glyoxylate shunt pathway to infection. 3. Formation and Maintenance of the Granuloma and its role in Infection by *Mycobacterium* spp: we carried out a systematic analysis of bacterial lipidoglycans released and trafficked through infected macrophages. These comprise 7 major species of lipids some, or all, capable of inducing granulomas in mice. The ability of these lipids to expand the influence of the bacteria beyond the infected macrophages and induce granuloma formation suggest that they play roles key to the evolution of this response. Our recent development of an in vivo model exploiting these lipids will enable the functional determination of the roles of these molecules in granuloma induction.

**PROJECT CONTACT:**

Name: Wood, J. R.  
Phone: 607-253-3759  
Fax: 607-253-3756  
Email: jrw7@cornell.edu

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**ACCESSION NO:** 0185687 **SUBFILE:** CRIS

**PROJ NO:** NYCV-433394 **AGENCY:** CSVM NYCV

**PROJ TYPE:** STATE **PROJ STATUS:** NEW

**START:** 01 JUL 2000 **TERM:** 30 JUN 2005 **FY:** 2006

**INVESTIGATOR:** Russell, D. G.

**PERFORMING INSTITUTION:**

Microbiology And Immunology  
Cornell University  
Ithaca, New York 14853  
Intramacrophage Infections

**NON-TECHNICAL SUMMARY:** Our lab is devoted to the study of microbial pathogens that exploit the macrophage as their host cell.

**OBJECTIVES:** The macrophage is the primary defence against microbial invasion. Despite its microbicidal capabilities several pathogens have evolved to live inside it. We work predominantly with the intracellular pathogens *Mycobacterium* and *Leishmania*. The *Mycobacterium* species on which we work include pathogens of humans (*M. leprae* and *M. tuberculosis*), cattle (*M. bovis*) and birds (*M. avium*). The *Leishmania* species include pathogens of humans (*L. mexicana*) and dogs (*L. infantum*). Both pathogens reside in membrane bound vacuoles within their host cells and cause chronic persistent infections capable of reactivation. My lab is interested in the nature of this interaction as a longterm relationship between two organisms. Our objectives are the following: 1) Understand the nature of the intracellular compartment that supports growth of these pathogens. 2) How do these pathogens ensure their longterm persistence despite residing in a host cell capable of stimulating a cellular immune response and subsequently responding to macrophage-activating cytokines and killing the pathogens. 3) Understanding the metabolism of intracellular pathogens, with particular reference to their carbon source utilization.

**APPROACH:** 1) For characterization of the vacuoles and identification of the mechanisms of vacuole modification we have employed cell biological techniques for analysis of the vacuoles in situ. These are underpinned with cell fractionation and biochemical identification of the vacuolar constituents. 2) We have used both metabolic-labeling and fluorochrome-tagging methods for labelling pathogen surface glycolipids to track their release and trafficking through their host cells. 3) The metabolic studies are being conducted through screens of transposon mutagenized bacteria to identify mutations in specific steps of fatty acid uptake and catabolism, in the glyoxylate shunt pathway, and in gluconeogenesis. The identified genes are analyzed by replacement and complementation, growth on different carbon source and analysis of their phenotypes in macrophage cultures and in the mouse. We are studying the activities and structures of recombinant enzymes from these pathways and using these enzymes for drug screens.

**PROJECT CONTACT:**

Name: Russell, D. G.  
Phone: 607-253-3401  
Fax: 607-253-4058  
Email: mdl1@cornell.edu

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**ACCESSION NO:** 0190583 **SUBFILE:** CRIS  
**PROJ NO:** ORE00031 **AGENCY:** CSREES ORE  
**PROJ TYPE:** ANIMAL HEALTH **PROJ STATUS:** TERMINATED  
**START:** 01 JUL 2003 **TERM:** 30 SEP 2005 **FY:** 2004

**INVESTIGATOR:** Kent, M. L.

**PERFORMING INSTITUTION:**

Microbiology  
Oregon State University  
Corvallis, Oregon 97331

**CHARACTERIZATION OF MYCOBACTERIUM SPP. FROM FISHES OF OREGON**

**NON-TECHNICAL SUMMARY:** Diseases impact both wild and captive fishes. One of these is a bacterial disease called 'fish mycobacteriosis' or 'fish tuberculosis.' Many strains or species of *Mycobacterium* occur in fish, and we will use both traditional methods and molecular biology to resolve their identity. The project examines the taxonomy of *Mycobacterium* pathogenic bacteria in fishes in Oregon. This study has demonstrated that several more *Mycobacterium* spp. infect fishes than previously thought. Some of these strains may be related to pathogens of humans.

**OBJECTIVES:** Our overall objectives are 1) to continue to resolve the taxonomy of *Mycobacterium* species infecting various commercially important fishes in Oregon, focusing on a more variable region of the rDNA gene (ITS), 2) to evaluate the virulence of selected strains using macrophage assays, and 3) to develop PCR-based diagnostic tests using

these isolates. Such tests would ultimately be employed by fish health researchers and diagnostic laboratories in the Department of Microbiology, the College of Veterinary Medicine, and Oregon Department of Fisheries & Wildlife. Moreover, we will evaluate the potential virulence of the strains in culture to mammals and fish using in vitro macrophage models. Using human, mouse and fish cell lines we will evaluate whether strains from fish are pathogens to both mammals and humans, fish pathogens only, or merely opportunists

**APPROACH:** rDNA sequences.. We will obtain rDNA sequences using both direct PCR from tissues and PCR from isolated colonies. In addition, we will continue to use our new primers for amplification of problematic samples, especially fish tissue samples, as they amplify smaller products and thus appear to be more sensitive for certain samples. These primer sets provide SSU sequence, and to more precisely characterize and differentiate our isolates (e.g., the closely related salmonid isolates), we will examine a more variable region of the gene (the ITS) using published primers. After the various isolates are sequenced, we will compare sequences using BLAST Search to compare with existing strains in GenBank. Furthermore, we will conduct phylogenetic comparisons using standard molecular systematics programs available through PAUP, etc. Virulence. We will characterize the virulence of representative strains obtained from our epidemiological and taxonomy studies using in vitro macrophage assays. To evaluate the ability of the bacterium to infect and survive in macrophages, we propose to employ the systems currently in use in Dr. Bermudez's laboratory. We plan to determine: (1) efficiency of invasion and (2) the ability of survive and replicate inside macrophages. For those experiments we propose to use carp macrophage cell line, the zebrafish macrophage cell line we have recently established from zebrafish spleens, and mouse macrophage cell line RAW 246.7. We also plan to use as controls for the experiments a human isolate of *Mycobacterium avium*, a fish derived *Mycobacterium marinum* (also a human isolate) and a non-virulent *Mycobacterium smegmatis*. The strain to be tested and the controls will be cultured and then used to infect macrophages in a ratio of 0.1 to 1, 1 to 1 and 10 to 1 (bacteria:macrophage). Invasion will be determined after 1 hour. The inoculum will be plated onto 7H11 agar plates to determine the number of bacteria. Infected macrophage monolayers will be washed several times with buffer in order to remove extracellular bacteria and then the monolayers will be lysed by incubating them with water for 10 min as described (Bermudez and Young 1988; Bermudez et al. 1994). Then 0.025% SDS will be added to the suspension for 10 additional minutes to prevent clumping. The suspension will be plate onto 7H11 plates to determine the number of viable intracellular bacteria. The efficiency of invasion will be calculated as a percentage of the initial inoculum used to infect the monolayers. To determine the ability of the bacteria to grow intracellularly, monolayers will be established and infected in a similar manner as described above. The intracellular bacteria will be allowed to grow and 4 and 7 days after infection the monolayers will be lysed and the number of intracellular bacteria quantified as reported (Wagner et al. 2002). The bacterial growth or decrease of the number of intracellular bacteria will be calculated as the variation of the number of bacteria inside macrophages 1 h after infection.

**PROGRESS:** 2003/07 TO 2005/09

Bacteria in the genus *Mycobacterium* are responsible for many diseases in humans (tuberculosis and leprosy) and in domestic animals (i.e., pseudotuberculosis of sheep and cattle). Infections by various species of *Mycobacterium* bacteria are also common in a wide variety of both wild and captive fishes. Mycobacteriosis of fishes is of importance to agriculture (aquaculture) in the state of Oregon as it is common in our hatchery reared salmonids, aquarium fishes and commercially important marine fishes (i.e. rockfishes). *Mycobacterium* species of fishes are also of concern because they infect humans. *Mycobacterium marinum* is ubiquitous in the aquatic environment. The bacterium can cause systemic infection in fishes, and usually skin infection in humans. Most strains grow better at temperatures lower than 37C, and this characteristic has been used to explain the rarity of deep tissue or systemic infections in humans. We investigated the ability of a strain from humans and 3 strains from fish to grow in various media at 30C and 37C, and in macrophage cell lines from carp, humans, and mouse. We also tested the ability of the 3 fish isolates to infect mice by both foot pad and intravascular injections. Significant discrepancies in the ability of some strains to grow in vitro versus in macrophages and in vivo were observed. Only one fish isolate grew well at 37 C, but all fish strains were capable of causing systemic infections in mice. Recent studies have suggested that isolates from fish would not cause disease in humans, and our findings suggest that certain strains from fish are indeed capable of growth at 37C in mammals even if they do not grown on culture plates at this temperature.

**IMPACT:** 2003/07 TO 2005/09

*Mycobacterium marinum* is a common environmental bacterium that often causes disease in captive or wild fishes. It occasionally infects humans, but is usually confined to the skin. The hypothesis for the location of the infection has

been that the bacterium is that most strains of the bacterium are not capable of growing at human body temperatures. This project demonstrated that certain strains of *Mycobacterium marinum* are capable of growing at human body temperatures under the appropriate circumstances, i.e. within human or mouse macrophages in culture or within live mice. This suggests that the bacterium is more capable of causing systemic infections in humans than previously thought.

**PUBLICATIONS (not previously reported):** 2003/07 TO 2005/09

1. Kent, ML , V. Watral , M. Wu , L. Bermudez. 2005. In vivo and in vitro growth of *Mycobacterium marinum* at homoeothermic temperatures. FEMS Microbiol. Lett. (in press).

**PROJECT CONTACT:**

Name: Kent, M. L.

Phone: 541-737-5088

Fax: 541-737-2166

Email: Michael.Kent@orst.edu

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**ACCESSION NO:** 0209159 **SUBFILE:** CRIS

**PROJ NO:** TEN00344 **AGENCY:** CSREES TEN

**PROJ TYPE:** HATCH **PROJ STATUS:** NEW

**START:** 01 OCT 2006 **TERM:** 30 SEP 2011

**INVESTIGATOR:** Hickling, G. J.; Muller, L.; Gray, M. J.; Eda, S.; Henry, T. B.;  
Scott, M. C.

**PERFORMING INSTITUTION:**

Forestry Fisheries & Wildlife

University of Tennessee

569 Dabne Hall

Knoxville, Tennessee 37996

**NEW APPROACHES TO WILDLIFE HEALTH: MONITORING AND MANAGING DISEASE SPREAD  
BETWEEN FREE-RANGING WILDLIFE, LIVESTOCK AND HUMANS.**

**NON-TECHNICAL SUMMARY:** Throughout the U.S., and internationally, wildlife have extensive and growing contact with livestock and human populations. Aquaculture initiatives continue to expand and diversify. Consequently, there are increasing problems with emerging and resurging fish and wildlife disease that have significant implications for human health. Contributing factors include the recovery of previously over-exploited wildlife populations, the intermingling of suburban development with wildlife habitat, and the development of new farming and aquaculture techniques. Emergence of new and introduced pathogens compounds the problem. This project represents a multi-disciplinary approach to the investigation of disease problems arising at the interface between wildlife, livestock and human populations. Laboratory and field approaches are combined to investigate specific disease problems. A particular focus is on ecological perspectives on pathogen-host interactions that are often overlooked in by more traditional veterinary and public health approaches. The project also builds capacity in the areas of cellular and molecular biology of wildlife and veterinary diseases.

**OBJECTIVES:** 1. Determine the influence of cattle in wetlands on pathogen transmission and prevalence in amphibian communities; 2. Determine whether amphibians could serve as spill-over hosts of zoonotic pathogens; 3. Investigate the effects of environmental stressors on fish physiology in laboratory experiments using zebrafish; 4. Use results of laboratory experiments with zebrafish to direct mesocosm toxicology studies on environmentally relevant native fish species; 5. Link results obtained in laboratory research and mesocosm studies to guide toxicology research on native fishes in Tennessee watersheds; 6. Investigate the spread and emergence of wildlife-vectored, tick-borne disease in Tennessee; 7. Model the spatial dynamics of bovine tuberculosis in wild ungulates; 8. Develop improved chemical immobilization techniques for capturing and collaring deer and other mammals; 9. Develop innovative

immunological assays that will allow assessment of reproductive function in free-ranging deer and elk using blood and fecal samples; 10. Develop and evaluate improved diagnostic tests for mycobacterial diseases in wildlife, livestock and humans.

**APPROACH:** 1-2. Experimental challenges will be performed, involving oral inoculations of tadpoles with amphibian and zoonotic pathogens under various immunocompromised scenarios that represent field conditions in cattle-access and non-access wetlands. 3-5. Laboratory experiments will involve exposure of specific life stages of fish to a toxicant (or an electric field) and include examination of various endpoints, including gene expression, collection of tissues for histopathology, assessment of reproduction, and assessment of behavior. Field research involves collection of fish from aquatic environments stressed by presence of toxicants, or exposure of fish in cages to conditions present at field sites. 6. A spatially explicit simulation model of the spatial dynamics of tick, pathogens, reservoir host species (mice, raccoons, birds, deer) and human risk potential will be developed. The model will be interfaced with data stored in a geographic information system to use realistic landscape composition, relative abundance and spatial distribution characteristics of the Tennessee landscape. 7. A spatially-explicit, stochastic model of TB dynamics in white-tailed deer will be developed by adapting an existing model of TB in brushtail possums (*Trichosurus vulpecula*) in New Zealand. The base model is a mixed deterministic/stochastic type, with the number of infectious contacts influenced by deer abundance, herd immunity, vaccination, prevalence of TB, and other relevant factors. 8-9. Chemical immobilization techniques developed by Miller et al. (2004) will be refined. Radioimmunoassays and enzyme-linked immunosorbent assays (ELISA) for protein hormones will be used to study reproductive function in deer and elk using blood and fecal samples. 10. Serum samples from various *M. bovis*-infected animals (cattle, sheep and wildlife) will be obtained from collaborators. Flow Cytometry and the UT-ELISA will then be used to determine diagnostic sensitivity, specificity and cut-off values for diagnosis of bovine TB.

**PROJECT CONTACT:**

Name: Hickling, G. J.

Phone: 865-974-6173

Fax: 865-974-4714

Email: ghicklin@tennessee.edu

URL: <http://wildlifehealth.tennessee.edu>

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**ACCESSION NO:** 0193020 **SUBFILE:** CRIS

**PROJ NO:** WNV-00155 **AGENCY:** CSREES WN.V

**PROJ TYPE:** ANIMAL HEALTH **PROJ STATUS:** TERMINATED

**START:** 01 JUL 2002 **TERM:** 30 JUN 2003 **FY:** 2003

**INVESTIGATOR:** Davis, W. C.; Barrington, G. M.; Park, Y. H.

**PERFORMING INSTITUTION:**

Animal Health Research Center

Washington State University

Pullman, Washington 99164

**RAPID UNIVERSAL DIAGNOSTIC ASSAYS FOR DETECTION AND DIFFERENTIATION OF ANIMALS INFECTED WITH *M. BOVIS* AND/OR *M. PARATUBERCULOSIS***

**NON-TECHNICAL SUMMARY:** Two mycobacteria are of economic importance and a potential health hazard for animals and humans: *M. bovis*, the causative agent of bovine tuberculosis and *M. paratuberculosis*, the causative agent of Johne's disease (paratuberculosis). The lack of effective vaccines and rapid diagnostic tests for early detection has made eradication of these diseases difficult. There is an essential need to develop better assays to control these diseases. The primary objective of this research is to develop rapid simple diagnostic assays that can be used for early diagnosis and control of these diseases.

**OBJECTIVES:** 1. Demonstrate an anti-RBC monoclonal antibody conjugated with peptide sequences containing an

epitope derived from species-specific early antigens expressed by Mbv and Map can be used in an autologous hemagglutination assay to detect animals infected with either pathogen. 2. Demonstrate a commercial latex bead coated with peptide sequences containing an epitope derived from species-specific early antigens expressed by Mbv and Map can be used in an agglutination assay to detect animals infected with either pathogen.

**APPROACH:** 1. A non-hemagglutinating mAb, TH17A (IgM), known to recognize a highly conserved determinant on RBCs and leukocytes, will be used in the initial studies to prepare ESAT-6 and a362 peptide conjugates. Peptides containing the immunodominant determinants of ESAT-6 and a362 will be prepared with an extra lysine for conjugation with the mAb. Following purification, the mAb will be treated with sodium periodate to generate aldehyde groups on the carbohydrate sidechains. The peptides will bind through an amine group to the aldehyde. The binding of mAb-peptide conjugates to RBC will be demonstrated by flow cytometry. Reactivity of the peptide will be determined by ELISA before and after coupling to the antibody, using immune sera from animals infected with Mbv or Map. Nonspecific peptides will be coupled to the mAb and used as negative controls. The mAb conjugates will be tested for their capacity to agglutinate in the presence of antibody. 2. A commercial source of sulfated 0.8 mM latex microspheres will be used in initial trials to develop bead assays to detect ESAT-6 and a362 peptide antigens. The beads will be prepared according to the manufacturer's protocol and reacted with serial dilutions of ESAT-6 and a362 peptides. Comparable sets of latex beads will be coated with nonspecific peptides to serve as negative controls. Following validation of the capacity of the mAb and latex bead conjugates to form antibody-antigen aggregates, studies will be performed with sets of antisera from known infected animals and uninfected animals to establish the sensitivity and specificity of the assays.

**PROGRESS:** 2002/07 TO 2003/06

The objective of the study was to develop and compare the sensitivity and specificity of two antigenic peptide based assays for use in the diagnosis and control of bovine tuberculosis and paratuberculosis. A red blood cell (rbc) based antigen-antibody capture assay and antigen coated latex bead assay were developed and compared with the sensitivity and specificity of an existing enzyme linked immunosorbent assay (EIA). An antigenic peptide from *Mycobacterium bovis*, ESAT-6, was used as the first test antigen. The rbc based antigen assay proved to be difficult to use and not sufficiently sensitive so further efforts to develop the assay were stopped. Comparison of the latex bead agglutination assay with the EIA, with a panel of sera obtained from infected and uninfected animals, showed both assays yield comparable levels of sensitivity, 94% and 96% respectively. The data suggest it will be possible to develop a rapid latex bead based diagnostic assay for use in the diagnosis of animals infected with *M. bovis*. Studies are now needed with blind panels of sera from known infected and uninfected animals to verify the sensitivity and specificity of the assay. Studies are also needed to determine if a comparably sensitive latex bead agglutination assay can be developed for paratuberculosis.

**IMPACT:** 2002/07 TO 2003/06

Diagnostic assays that improve our ability to detect infected animals at early stages of disease will help control disease and the movement of infected animals into clean dairy and cattle operations.

**PUBLICATIONS (not previously reported):** 2002/07 TO 2003/06

No publications reported this period

**PROJECT CONTACT:**

Name: Davis, W. C.

Phone: 509-335-6051

Fax: 509-335-8328

Email: davisw@vetmed.wsu.edu

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