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Information Resources on the South American Camelids: Llamas, Alpacas, Guanacos, and Vicunas 1943-2006

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The South American Camelids: Llamas, Alpacas, Guanacos, and Vicunas 1943-2006

Introduction

The Camelidae family consists of a small family of mammalian animals. There are two members of Old World camels living in Africa and Asia--Arabian and the Bactrian, and four members of the New World camels living in South America--the llamas, vicunas, alpacas and guanacos. They are all very well adapted to their respective environments: the camels in harsh deserts of Africa and Asia; and their South American cousins inhabit the high altiplano and bush area of South America. Most of these species have been integrated into, and play very important roles in lives of the indigenous people. They have been traditionally used for transport of people and things, hides and fibers for clothing and other textile articles, and in many cases they supply meat and milk products, etc. The South American species are being raised in non-native countries for a variety of reasons: as pack animals, pets, guard animals for sheep ranges, and for fiber. Their biology, reproduction, disease susceptibility, behavior, and nutrition have not been studied to any great extent until fairly recently. Because there are now fairly high populations of these animals in the United States and some other temperate countries, there has been more interest and need to understand their needs, in order to provide adequate housing, feed and veterinary care as they are moved from their native environments to new climates, etc. It is with these needs in mind, that this information resource has been compiled.

Camelidae Family (see Mason, I.L. 1979 for more taxonomic information and characteristics of these animals.)

Oddly enough, the Camelidae evolved in North America. The early ancestors migrated from North America by a crossing the Alaskan land bridge to Asia and the Panama land connection to South America. They eventually became extinct in North America, but began to thrive in their new lands. At one time camels ranged from Asia to Eastern Europe. After crossing into Africa, they were found across the entire northern region and as far south as northern Tanzania. The South American members of the family found their niche in the cool, dry mountain areas of that continent.

Taxonomy

Camelids are in the taxonomic order Artiodactyla (even toed ungulates), sub order Tylopoda (pad-footed), and Family Camlidae. They are ruminants along with the giraffes, deer, cattle, sheep, goats and antelopes. They have several unique features: they walk on pads not hoofs, do not have horns or antlers, and their red blood cells are oval in shape. The New World camelids include two wild species in the high Andes of South America-- the vicuna (*Vicugna vicugna*) and the guanaco (*Lama guanacoe*). The native peoples of the Andes domesticated these animals and though selective breeding developed the llama (*Lama glama*) and the alpaca (*Lama pacos*). There seems to be some controversy over the parent species of the alpaca and llama. The evidence suggests that both domestic species were derived from the guanaco. These South American animals have long necks like the camel, but no humps. They also have the ability to survive in harsh dry climates due to their ability to conserve their body water.

Introduction to the South American Camelidae

Each of the South American camelids has unique qualities, value and can be used as a source of a wide range of services and products useful to humans. Therefore, a short description and use of each of these interesting and quite tractable animals follows. The animals are medium sized, with the males being somewhat larger than the females. Their heads have a straight profile. They have no horns or antlers. They have large eyes and thick lashes. The ears are long and pointed. One obvious feature that is different from camels is the lack of a hump as their backs are straight. Their foot pads are proportionately smaller than a camel's because they need to move securely on rocky trails and gravel mountain slopes. Since they live in cold, dry places, they have very dense, wooly coats. They may kick or spit if threatened.

As mentioned above, there are probably just basically two species. All four types have been found to breed in captivity, so genetic relationships are uncertain. The llamoid or camelid is a common name for this group.

Llamas* (*Lama glama*)

Llamas are medium sized animals and can weigh up to 300 pounds. Males are somewhat larger than the females. They are used for fiber and as unusual pack animals in many countries around the world. Currently, they are being used for hauling carts and driving, pet therapy with elderly and disabled persons and as guard animals in large free-range sheep operations. They are environmentally sensitive and intelligent. They are also extremely gentle and used as pet therapy because of their calming effect. They seldom bite or butt and they have no horns, hooves, or claws to do injury. They are alert, curious, adaptable, and predictable with docile, disarming temperaments. They are adapted to high altitudes because their hemoglobin, a constituent of red blood cells, can absorb more oxygen than that of other mammals. Their red blood cells also have a longer life span than other mammals, an average of 235 days versus 100 days for humans.

Llamas were also used by the ancient Inca civilization in South America. Archeological evidence indicates that they have been domesticated from the wild guanaco approximately 5,000 years ago. Many llamas and alpacas were sacrificed to the gods every year by the Incan culture. The meat would then be distributed to the crowds. Llamas were also an integral part of the Inca's workforce. As pack animals they contributed vastly to the building of their irrigation systems, roads, and temples. They were also used to carry loads in the Inca's mines.

Llamas are still used today by the indigenous peoples of South America for packing and transporting goods, fibers, and for meat. Mostly the males are used as pack animal. They usually carry up to fifty pound loads. Stallions can carry up to 110-176 pounds for about 19 miles (a day's march for a llama). Male pack animals are not sheared. Their heavy wool coat acts as a saddle blanket by cushioning their loads. It has been suggested that the llamas were selectively bred as pack animals leading to a larger stronger animals than their wild parent. The females are sheared, but llama wool is inferior to the alpacas and is often used to make rope. (The alpaca has probably been selected and breed for wool and not as a pack animal.) Llamas only allow themselves to be loaded when they are part of a group. Llamas provide meat, wool, hides for sandals, and fat for candles. Their dung can be dried and used for fuel. South American herders use most parts of a llama's carcass.

Alpacas+,* domesticated 6-7,000 years ago

Alpaca's roots also go back to the Inca civilization, where alpacas were considered a "prize." Kadwell et al ¹ used mitochondrial and microsatellite DNA analysis that indicates that the vicuna was the ancestor of the alpaca. Their coats make the finest quality wool. Alpaca fiber was woven into robes used by Inca royalty. They also provided food, fuel, clothing, and transportation for this culture in an otherwise extremely hostile environment. Alpacas still thrive in the harsh climates of the Peruvian, Bolivian, and Chilean highlands where scorching temperatures in the day plummet to sub-freezing at night. They prefer low humidity and altitudes between 13,000 and 16,000 feet. At low altitudes, their wool is often of poorer quality. Nevertheless, they are well suited for conditions in the US and are being bred in at least 44 states (1997 estimates).

Alpacas are small compared to llamas, approximately 36" at the withers. Piebald color patterns are much rarer than in llamas, and alpacas usually have a tuft of hair on their forehead. Their life span is 15 to 25 years. Their weight can range between 100 to 175 pounds (approximately one-half to one-third the size of a llama). Their gestation period is approximately 11.5 months. Their birth weight is between 15 and 19 pounds and the babies (cria) can stand and nurse within 30 minutes to one hour after birth. They also have a very low infant mortality rate.

The males produce approximately eight pounds and the females about five pounds of easily marketable wool fiber from their coats per year. The fiber comes in approximately 22 basic colors with many variations and blends. It has a cellular structure similar to hair and is more resilient and much stronger than Merino sheep wool. It is highly sought after in Britain, Europe, and Japan. The cria fiber is extra fine and lustrous and commands a higher selling price. Their wool quality is only slightly lower than the vicuna. The black coats are usually the heaviest. The Suri breed has finer, thicker, and longer hair and provides up to eleven pounds of wool per year, but the breed has a greater susceptibility to parasites.

In South America, shearings are usually done every two years before the rainy season in November and December. After seven years of age, alpacas are used primarily for meat. In 1972, there were about two million living in Peru and 50,000 in Bolivia.

Alpacas are inexpensive to feed (about \$1 per day per alpaca). This is about the same cost as a large dog. They have three stomachs which enable them to be very efficient at digesting what they eat. They are more fastidious feeders than llamas, being very Earth-friendly by grazing meticulously throughout the pasture. They prefer free range pasture to confinement in a stall or barn. They have sensitive feet and prefer soft, moist ground with tender grasses. They also enjoy pools and puddles for wallowing. A lack of adequate ground moisture is thought to lead to a fatal foot disease and rainless years often lead to higher mortality rates. No special food is required for them except in winter or in late pregnancy when all they need is good quality hay and low protein pellets. Alpacas will spit on one another if sufficiently angered, but will rarely spit on people.

One acre will provide ample room for five to ten alpacas, much more economical than most other types of livestock. Any fencing that may be required is usually to keep predators out of the pasture versus keeping the alpacas in. Simple shelters will suffice, usually only requiring a three-sided enclosure or a lean-to. Alpacas usually defecate in fixed areas and avoid grazing there, keeping parasitic infestations low. Their manure also makes an excellent fertilizer.

They have a high world market value between \$8,500 and \$25,000 per animal; a breeding age female goes for \$15,000 to 25,000 (1997 estimates). Some female alpacas are bred as young as 6-12 months of age because breeders are in a hurry to produce young, but it is recommended that the first breeding be at 18-24 months of age to allow full physical and social maturity. In the United States, they can be insured and depreciated from the owner's taxes. Other tax advantages include expense deductions and deferred recognition of accumulating wealth.

There are relatively few of these animals in North America (less than 8,000 in 1996). They were first imported to the US in 1984 and spread quickly to Canada. There have been limited numbers allowed for export from South America for reasons such as restricting their export and animal health problems.

Guanacos*

Guanacos are the larger of the two wild camelid species. They stand about four feet tall at the shoulder and about five feet to the top of the head. They have a body length of up to six feet with an approximately ten-inch long tail. They can weigh up to 210 pounds. Their woolly coat is tawny to brown and their head is usually grey.

Wild guanacos thrive in the plains of northern Peru to southern Patagonia. They often live in the mountains and altiplano areas above 12,000 feet. Usually herds of several females travel with one male; however, leaderless herds of males of up to 200 have been found. The guanaco can run at speeds up to 40 miles per hour and they are also strong swimmers. Their mating season is during August and September. They have a ten to eleven month gestation period. The babies can run soon after birth and are weaned at six to twelve weeks.

Vicunas*

Vicunas are smaller than guanacos and weigh only about 100 pounds. Vicunas thrive in the mountainous regions of Northern Peru and Chile at altitudes above 14,000 feet. They are up to three feet at the shoulder and usually have a light brown coat with a yellow-red bib. They are very social animals. There are male dominated family groups. Non-territorial males form groups of both young and desposed older males. Vicunas are less easy to tame than the guanaco because they are extremely shy, but some South American Jesuits have shown they can be domesticated. These animals are less adaptable to different environments. The native people do harvest the wool of these animals. They drive them into an enclosure, shear them, and release them.

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Barbara Buchanan, webmaster for the AWIC program, spent many hours editing the entire document, correcting errors, standardizing citation formats, adding the many new citations, and converting everything into HTML. Her careful attention to detail helped greatly to provide a consistent, accurate and more readable document.

About this Document

There have been a number of decisions made regarding the topics that included in this publication. The topical choices include the following: all four animals are covered; the results of science-based research on the biology, physiology and care of these animals in both their native environments, and as transplants to other countries; the management of these animals by the native people as both herd and natural resources; some information on the important products such as fiber and meat; the role and economic value of the animals and animal products in rural communities; disease and

disease organisms; veterinary care of diseases, injuries, surgery, genetic conditions, etc. The information sources are books, conference papers, and journal articles. Some credible web site resources are also listed. Abstracts are included when available.

The information in this resource has been extracted primarily from a variety of resources, and the collection of the National Agricultural Library. It is not a comprehensive listing of the Worlds literature available on these animals. However, all the information listed includes the National Agricultural Library call number for ease when requesting photocopies or interlibrary loans. Please see <http://www.nal.usda.gov/borrow-materials> for lending and document delivery information.

The bibliographic citations are arranged by publication year and alphabetically by author within each year. Since this is an electronic version, it does not include an index. It is expected that by searching using key words, the user will find what is of interest. Much of the information is in English.

The compiler welcomes additional information from other sources for inclusion or any comments or suggestions. It is desirable to have a comprehensive resource of information about these animals, and collaborators are welcome. If you have or know of science based information that would enhance this publication, please contact me. Note that any information submitted must have the important elements of identification and access i.e author, year, publication information, title, accessibility, etc.

Please send your comments, information, or suggestions to:

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Fax: 301-504-7125

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Descriptors: guanacos, juvenile animals, males and females, behavioral tactics, aggression, dispersal, submission, submissive crouch, sex comparisons, group size and seasonal influences, Torres del Paine National Park, Chile.

2005

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Descriptors: 12 adult non-pregnant females vicunas, follicular dynamics, exogenous progesterone, testing ability for synchronize ovarian activity, response to eCG treatment, trans-rectal ultrasonography, plasma progesterone and estradiol-17 beta concentrations monitored, CIDR® inserted vaginally, effects of various treatments, possibilities for synchronization.

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Descriptors: guanacos, *Lama guanicoe*, feeding behavior, *Nothofagus pumilio*, browsing behavior, forest gap environments, Tierra del Fuego, Chile.

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NAL call no.: 41.8 AM3A

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NAL call no.: SF810.4.V4

Descriptors: 43 adult llamas, 200 vicunas, *Toxoplasma gondii*, serum samples, IFAT to detect titers, western blot, first recorded detection, Peru.

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URL: <http://www.sciencedirect.com/science/journal/09214488>

NAL call no.: SF380.I52

Descriptors: 20 llamas, 40 alpacas, slaughter at 25 months, carcass characteristics, weights, various cuts, full digestive tract heaviest, dressing percentage, comparison, llama more easily bred for meat production, Peru.

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URL: <http://www.sciencedirect.com/science/journal/03044017>

NAL call no.: SF810.4.V4

Descriptors: alpacas, natural infections of *Chorioptes* mites, mange mite control, eprinomectin protocol was effective, ivermectin, efficacy of treatments.

D'Alterio, G.L.; Callaghan, C.; Just, C.; Manner-Smith, A.; Foster, A.P.; Knowles, T.G. **Prevalence of *Chorioptes* sp. mite infestation in alpaca (*Lama pacos*) in the south-west of England: implications for skin health**. *Small*

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Descriptors: llamas, skin health implications, *Chorioptes* sp., parasitic mite prevalence, England.

Dolk, Edward; van der Vaart, Marcel; Lutje-Hulsik, David; Vriend, Gert; de Haard, Hans; Spinelli, Silvia; Cambillau, Christian; Frenken, Leon; Verrips, Theo. **Isolation of llama antibody fragments for prevention of dandruff by phage display in shampoo.** *Applied and Environmental Microbiology*. 2005 Jan; 71(1): 442-450. ISSN: 0099-2240.

NAL call no.: 448.3 AP5

Descriptors: dandruff control in humans, llama antibody fragments, cell surface binding in a shampoo, *Malassezia furfur*, fungus control.

Abstract: As part of research exploring the feasibility of using antibody fragments to inhibit the growth of organisms implicated in dandruff, we isolated antibody fragments that bind to a cell surface protein of *Malassezia furfur* in the presence of shampoo. We found that phage display of llama single-domain antibody fragments (VHHs) can be extended to very harsh conditions, such as the presence of shampoo containing nonionic and anionic surfactants. We selected several VHHs that bind to the cell wall protein Malf1 of *M. furfur*, a fungus implicated in causing dandruff. In addition to high stability in the presence of shampoo, these VHHs are also stable under other denaturing conditions, such as high urea concentrations. Many of the stable VHHs were found to contain arginine at position 44. Replacement of the native amino acid at position 44 with arginine in the most stable VHH that lacked this arginine resulted in a dramatic further increase in the stability. The combination of the unique properties of VHHs together with applied phage display and protein engineering is a powerful method for obtaining highly stable VHHs that can be used in a wide range of applications.

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NAL call no.: 41.8 V641

Descriptors: alpaca, bovine diarrhoea virus, BVD, case report, clinical aspects, diagnosis, diagnostic techniques, disease vectors, postmortem examinations.

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NAL call no.: QH1.J62

Descriptors: guanacos, success of transplanted/relocated animals, conservation measures, genetics, inbreeding, population dynamics, social behavior, zoogeography, introduced from Rio Gallegos, Argentina, restricted genetic pool, inbreeding, historical research, John Hamilton, Falkland Islands Government Archives, personal interviews, herd size, distribution on islands, behaviors, animals social structure, Falkland Islands.

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Descriptors: guanacos, foxes, introduced wildlife, historical perspective, John Hamilton, Staats Island, West Falkland Islands.

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Descriptors: llamas, enrofloxacin, pharmacokinetics, 3 routes of administration, intravenous, subcutaneous, oral.

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URL: <http://www.sciencedirect.com/science/journal/09214488>

NAL call no.: SF380.I52

Descriptors: South American camelids, gastrointestinal parasites, antihelminths not approved, llamas, alpacas, *Trichostrongylus* spp. and *Oesophagostomum* spp., natural infection, ivermectin injections subcutaneous, reduction in fecal egg counts, efficacy of drug, no adverse affects noted.

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Descriptors: immature female alpaca, *Enterobacter sakazakii*, antiprotozoal drug, enrofloxacin, sulfamethoxacin, dimethyl sulfoxide, trimethoprim, sulfonamides, renal acting drugs, antiparasitic drug.

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Descriptors: llamas, louping ill virus, *Ixodes ricinus*, brain disease, disease vectors, diagnosis, histopathology, clinical aspects, postmortem examinations, viral diseases.

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Descriptors: young female alpaca, young animal, stranguria, radiographic studies, bladder outlet obstruction, pelvic displacement of the bladder, case report, clinical aspects, cystopexy surgery, uncomplicated recovery.

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Descriptors: male alpaca, pruritus, alopecia, hyperkeratotic crusts on hind legs, histopathological analysis of skin section, *Sarcoptes scabiei*, first record in New Zealand.

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NAL call no.: SF810.4.V4

Descriptors: cattle, goats, sheep, dogs, cats, water buffalo, alpacas, llamas, wild canids, reproductive losses, *Neospora caninum*, epidemiology, disease control, South America.

Odbileg, Raadan; Lee, Sung Il; Ohashi, Kazuhiko; Onuma, Misao. **Cloning and sequence analysis of llama (*Lama glama*) Th2 (IL-4, IL-10 and IL-13) cytokines.** *Veterinary Immunology and Immunopathology.* 2005; 104(3-4): 145-153. ISSN: 0165-2427.

NAL call no.: SF757.2.V38

Descriptors: llamas, cytokine analysis, interleukin 4, IL-10, IL-13, amplification, specific primers designed from reported bovine cytokine genes, homology analysis, phylogenetic analysis, Artiodactyla, Perissodactyla.

Odbileg, R.; Konnai, S.; Usui, T.; Ohashi, K.; Onuma, M. **Quantification of llama inflammatory cytokine mRNAs by real-time RT-PCR.** *Journal of Veterinary Medical Science.* 2005; 67(2): 195-198. ISSN: 0916-7250.

Descriptors: llamas, PCR, complementary DNA, messenger RNA, cytokines, gene expression, immune system, interleukin 1, interleukin 6, lipopolysaccharides, tumor necrosis factor.

Padula, A.M. **Clinical evaluation of caudal epidural anaesthesia for the neutering of alpacas.** *Veterinary Record* (London). 2005; 156(19): 616-617. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: alpacas, neutering of males, castration, surgical procedures, efficacy of caudal epidural anesthesia.

Radi, Z.A.; Miller, D. L.; Liggett, A.D. **Cutaneous melanocytoma in a llama (*Lama glama*).** *Veterinary Research Communications*. 2005; 29(2): 137-140. ISSN: 0165-7380.

NAL call no.: SF601.V38

Descriptors: male llamas, skin tumor, tumor biology, diagnosis, treatment, case study.

Ratto, Marcelo; Berland, Marco; Huanca, Wilfredo; Singh, Jaswant; Adams, Gregg P. **In vitro and in vivo maturation of llama oocytes.** *Theriogenology*. 2005; 63(9): 2445-2457. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llama oocytes, postmortem collection of ovaries, in vitro culture for 28, 30, 36 hours, incubation conditions, reproductive technologies, FSH and eCG added, COC in metaphase II, in vitro fertilization.

Robinson, T.F.; Roeder, B.L.; Schaalje, G.B.; Hammer, J. D.; Burton, S.; Christensen, M. **Nitrogen balance and blood metabolites of alpaca (*Lama pacos*) fed three forages of different protein content.** *Small Ruminant Research*. 2005; 58(2): 123-133. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: male alpacas, 4 age groups, metabolism crates, straw, grass hay alfalfa, water ad libitum, 14 day treatment, effects on N balance and blood metabolites, dietary nitrogen requirements.

Sarno, R.J.; Bank, M.S.; Stern, H.A.; Franklin W.L. **Forced dispersal of juvenile guanacos (*Lama guanicoe*): causes, variation, and fates of individuals dispersing at different times.** 2005 (in press). Submitted to *Journal of Mammalogy*. ISSN: 1545-1542.

NAL call no.: 410 J823

Descriptors: guanacos, forced dispersal of young animals, causes, outcomes, seasonal differences.

Shapiro, J.L.; Watson, P.; McEwen, B.; Carman, S. **Highlights of camelid diagnoses from necropsy submissions to the Animal Health Laboratory, University of Guelph, from 1998 to 2004.** *Canadian Veterinary Journal*. 2005; 46(4): 317-318. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: llamas, alpacas, camelids, age differences, animal diseases, diagnoses, bacterial diseases, causes of death, diseases of gastrointestinal and nervous systems, liver, neoplasms, postmortem examinations, Ontario, Canada.

Smith, Jennifer J.; Dallap, Barbara L. **Splenic torsion in an alpaca.** *Veterinary Surgery*. 2005; 34(1): 1-4. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: adult female alpaca, splenic torsion, uterine torsion, abdominal discomfort, diagnosis, rectal examination, abdominocentesis, transabdominal ultrasound, surgical procedures, splenectomy, necrotized spleen, treatment successful, favorable prognosis.

Tee, S.Y.; Dowling, B.A.; Dart, A.J. **Treatment of long bone fractures in South American camelids: 5 cases.** *Australian Veterinary Journal*. 2005; 83(7): 418-420. ISSN: 0005-0423.

NAL call no.: 41.8 AU72

Descriptors: llama, alpacas, comminuted fracture of metatarsal bones, comminuted fracture of proximal radius, diagnosis with clinical examination and radiographs, treatment, open reduction and internal fixation, lag screws, dynamic compression plates, effectiveness of treatments.

Timoteo, O.; Maco, V. Jr.; Maco, V.; Neyra, V.; Yi, P.J.; Leguia, G.; Espinoza, J.R. **Characterization of the humoral immune response in alpacas (*Lama pacos*) experimentally infected with *Fasciola hepatica* against cysteine**

proteinases Fas1 and Fas2 and histopathological findings. *Veterinary Immunology and Immunopathology.* 2005; 106(1-2): 77-86. ISSN: 0165-2427. &nb sp;

NAL call no.: SF757.2.V38

Descriptors: 6 adult (1-2 year old) alpacas, *Lama pacos*, liver flukes, experimental infection with 200 metacercariae, *Fasciola hepatica*, proteinases of Fas1 and Fas2 antigens, immune responses, flukes recovered at necropsy, liver affects, circulating IgG antibodies, titers, ELISA.

Wolf, D.; Schares, G.; Cardenas, O.; Huanca, W.; Cordero, Aida; Baerwald, Andrea; Conraths, F.J.; Gauly, M.; Zahner, H.; Bauer, C. **Detection of specific antibodies to *Neospora caninum* and *Toxoplasma gondii* in naturally infected alpacas (*Lama pacos*), llamas (*Lama glama*) and vicunas (*Lama vicugna*) from Peru and Germany.** *Veterinary Parasitology.* 2005; 130(1-2): 81-87. ISSN: 0304-4017.

NAL call no.: SF810.4.V4

Descriptors: llamas, alpacas, wild vicunas, experimental infection, protozoal parasite, *Neospora caninum*, *Toxoplasma gondii*, sera testing, immunoblot, ELISA, IFAT, antibody detection against *N. caninum* tachyzoites, routes of infection, natural infections in South American camelids, Peru, Germany .

Zarebski, Laura M.; Urrutia, Mariela; Goldbaum, Fernando A. **Llama single domain antibodies as a tool for molecular mimicry.** *Journal of Molecular Biology.* 2005; 349(4): 814-824. ISSN: 0022-2836.

Descriptors: llamas, antibodies, heavy-chain IgGs (hcIgGs), variable region one polypeptide chain suitable for engineering, immunized with anti-DNA mouse mAb develop anti-ld response, immuno-stimulant, excellent tool for molecular mimicry.

Zhang, Qiao Ling; Dong, Chang Sheng; He, Jun Ping; He, Xiao Yan; Fan, Rui Wen; Geng, Jian Jun; Ren, Yu Hong. **[Study on the chromosomal karyotype and G-banding of alpacas (*Lama pacos*).]** *Yichuan.* 2005; 27(2): 221-226. ISSN: 0253-9772. Note: In Chinese with an English summary.

Descriptors: 23 Huacaya alpacas, 3 males, 20 females, genetics, chromosomes and karyotypes, cytogenetic basis for selection, breeding, disease diagnosis, genetic mechanisms of sex determination, lymphocyte culture, trypase-EDTA for G-banding, 74 chromosomes, XX, XY, autosomes, X chromosome was metacentric, Y chromosome telocentric.

2004

Al Ani, F.K. **Classification and breeds.** In: *Camel: Management and Diseases.* Faculty of Veterinary Medicine, Baghdad University, Baghdad, Iraq. 2004; 61-68.

Descriptors: alpacas, guanacos, llamas, vicunas, dromedaries, Bactrian camels, taxonomy, draft animals, riding animals, dual purpose animals, hybrids, breeds, adaptation, anatomy, physiology, milk and meat production.

Al Ani, F.K. **Domestication, distribution and population.** In: *Camel: Management and Diseases.* 2004; 1-24. Faculty of Veterinary Medicine, Baghdad University, Baghdad, Iraq.

Descriptors: camels, llamas, vicunas, dromedaries, Bactrian camels, domestication, geographical distribution, livestock numbers, population dynamics, Africa, Asia, Australia, Europe, North and South America, Saudi Arabia, United Arab Emirates.

Al Ani, F.K.; Ababneh, M.M. **South American camelids (SAC).** In: *Camel: Management and Diseases.* Faculty of Veterinary Medicine, Baghdad University, Baghdad, Iraq. 2004; 121-136.

Descriptors: alpacas, guanacos, llamas, vicunas, draft animals, riding animals, breeding, crossbreeding, diseases, husbandry, hematology, meat and milk production, reproduction, pregnancy diagnosis, parturition, physiology, surgery, wool producing animals, South America.

Al Izzi, S.A.; Abdouislam, O.E.; Al Bassam, L.S.; Azwai, S.M. **Haematological parameters in clinically normal llamas (*Lama glama*).** *Praxis Veterinaria Zagreb.* 2004; 52(3): 225-232. ISSN: 0350-4441. Note: In English with a summary in Croatian.

Descriptors: llamas, sex and age differences, blood base values, blood composition, proteins, fibrinogen, hemoglobin, prothrombin, thromboplastin, blood cells, basophils, eosinophils, erythrocyte count, leukocyte counts, lymphocytes, monocytes, platelets, reticulocytes.

Alwood, A.J.; Downend, A.B.; Slensky, K.A.; Fox, J.A.; Simpson, S.A.; Donahue, S.M.; Waddell, L.S.; Otto, C.M. **10th international veterinary emergency and critical care symposium, September 8-12, 2004. San Diego, California, USA.** *Journal of Veterinary Emergency and Critical Care*. 2004; 14(Supplement 1): 18 p. ISSN: 1534-6935. Note: Conference proceedings.

NAL call no.: SF778.J68

Descriptors: cats, dogs, donkeys, horses, llamas, *Clostridium tetani*, *Escherichia coli*, emergency and intensive care, acepromazine, albumins, anesthetics, anticoagulants, antioxidants, antibiotic resistance, benzodiazepines, blood chemistries, transfusions, cardiac diseases, catheterization convulsions, diagnostic techniques, disease control, drug resistance, electrocardiography, electroencephalograms, gastric acid, hemolytic anemia, hemorrhage, heparin, hyperkalaemia, ketamine, morphine, ketoacidosis, lithium, naltrexone, neoplasms, neuroleptics, observations, oxygen, respiratory diseases, septicaemia, spinal diseases, tetanus, therapy, transport of animals, troponins, urethra, respiratory distress syndrome, ventilation, seizures, thoracotomy, thromboelastography, thromboembolism, tramadol.

Anderson, D.E. **Common surgical procedures in camelids.** In: *Proceedings of the Thirty Seventh Annual Conference, American Association of Bovine Practitioners, Forth Worth, Texas, City, USA, 23-25 September, 2004.* 2004: 118-125. ISSN: 0743-0450.

NAL call no.: SF961.A5

Descriptors: alpacas, dromedary camels, llamas, surgical procedures, teeth, tooth diseases, abscesses, bone diseases, castration, digestive tract, limb bones, limbs, postoperative care.

Anderson, D.E. **Comparison of trace mineral concentration in the various lobes of the liver of alpacas and llamas.** *Journal of Animal and Veterinary Advances*. 2004; 3(3): 162-164. ISSN: 1680-5593.

Descriptors: alpacas, llamas, postmortem study, site of liver collection, affects on selected trace metals postmortem study, left lobe, right lobe, caudate lobe, analysed via inductively coupled argon plasma emission, spectroscopy, calcium, copper, iron, molybdenum, selenium, zinc, potassium.

Anderson, D.E.; Silveira, F.; Grubb, T. **Effects of venipuncture and correlation of plasma, serum and saliva cortisol concentration with transportation stress in camelids.** In: *Selected Research on Camelid Physiology and Nutrition.* The Camelid Publishers. Bikaner, India. 2004: 160-168. ISBN: 8190114123.

NAL call no.: SF401.C2S46 2004

Descriptors: alpacas, dromedary camels, llamas, camels, animal transport related stress effects, blood chemistry, saliva hydrocortisone, effects of venipuncture, intravenous injection, restraint of animals, stress response.

Anderson, D.E.; Rings, D.M.; Kowalski, J. **Infection with *Corynebacterium pseudotuberculosis* in five alpacas.** *Journal of the American Veterinary Medical Association*. 2004 Dec 1; 225(11): 1743-1747. ISSN: 0003-1488 .

NAL call no.: 41.8 AM3

Descriptors: alpacas, bacterial infection, *Corynebacterium pseudotuberculosis*, case study.

Anderson, D.E. **Liver disease, metabolism and digestion in llamas and alpacas.** In: *Selected Research on Camelid Physiology and Nutrition.* The Camelid Publishers. Bikaner, India. 2004: 545-554. ISBN: 8190114123.

NAL call no.: SF401.C2S46 2004

Descriptors: llamas, alpacas, liver disease, hepatitis, lipidosis, diagnosis, etiology, clinical aspects, therapy, digestion, disease prevalence surveys, disease prevention, energy requirements, epidemiology, metabolism, neoplasms, poisoning, therapy, toxicity.

Antonini, M.; Gonzales, M.; Valbonesi, A. **Relationship between age and postnatal skin follicular development in three types of South American domestic camelids.** *Livestock Production Science*. 2004; 90(2-3): 241-246. ISSN: 0301-6226.

NAL call no.: SF1.L5

Descriptors: 15 alpaca kids, (10 huacaya and 5 suri types), 10 llama kids (chaku type), age of secondary follicle maturity, skin follicular structure, difference in types, fiber study, shearing recommendation, "Alpaquero" Developing Centre of Toccoa, Arequipa Plateau, Caylloma Province, Peru.

Baldi, Ricardo; Pelliza-Sbriller, Alicia; Elston, David; Albon, Steve. **High potential for competition between**

guanacos and sheep in Patagonia. *Journal of Wildlife Management.* 2004; 68(4): 924-938. ISSN: 0022-541X.

NAL call no.: 410 J827

Descriptors: guanacos, sheep, diets in sympatric conditions, interspecific competition, fecal sampling, potential species comparison of diet at 9 sites and 2 seasons, diet plants overlap, competition with sheep may have played a role in guanaco populations, arid zones, impact on current management practices, Patagonia.

Bird, K.E.; Parker, J.E.; Andreasen, C.B.; Watrous, B.J.; Heidel, J.R. **Keratinizing ameloblastoma in a 9-month-old llama (*Lama glama*).** *Journal of Veterinary Diagnostic Investigation.* 2004; 16(1): 89-92. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: 9 month old llama, odontogenic disease, destruction of bony structure, epithelial neoplasms, mass on face, clinical aspects, differential diagnosis, keratinizing ameloblastoma, treatment was surgical excision at early stage, case report, Oregon, United States.

Burkholder, Tanya H.; Jensen, James; Chen, Hong; Junkins, Katherine; Chatfield, Jenifer; Boothe, Dawn. **Plasma evaluation for ivermectin in llamas (*Lama glama*) after standard subcutaneous dosing.** *Journal of Zoo and Wildlife Medicine.* 2004; 35(3): 395-396. ISSN: 1042-7260.

Descriptors: 5 llamas, pesticide levels, ivermectin, *Parelaphostrongylus tenuis*, brainworm nematode, meningeal worm, 200 micrograms/kg s.c. injections pharmacokinetics, plasma levels after 4 weeks post injection, dosage not adequate for therapeutic concentration, pharmacokinetics.

Buttolph, Lita P.; Coppock, D. Layne. **Influence of deferred grazing on vegetation dynamics and livestock productivity in an Andean pastoral system.** *Journal of Applied Ecology.* 2004; 41(4): 664-674. ISSN: 0021-8901.

NAL call no.: 410 J828

Descriptors: sheep, llamas, alpacas, rangeland management, range degradation, livestock productivity, equilibrium and non-equilibrium theory, key grazing resources, Andean pastoral ecosystem, fencing of bofedal and gramadal (wet and dry meadows) seasonally deferred grazing practices, peak standing crop, plant species, enclosures increased survival of young alpacas and sheep, different findings for meadow systems, negative effects of privatizing communal resources, Bolivia.

Cafrune, M.M.; Aguirre, D.H.; Freytes, I. **Fasciolosis en vicunas (*Vicugna vicugna*) en semi-cautiverio de Molinos, Salta, Argentina, con no tas de otros helmintos en este hospedador. [Fasciolosis in semi-captive vicunas (*Vicugna vicugna*) from Molinos, Salta, Argentina, with notes of other helminths on this host.]** *Veterinaria Argentina.* 2004; 21(207): 513-520. ISSN: 0326-4629. Note: In Spanish with an English summary.

NAL call no.: 41.8 G112

Descriptors: semi-captive vicunas, liver flukes, *Fasciola hepatica*, *Trichuris* sp., concurrent infections, diagnosis, disease prevalence and control, fascioliasis, infectivity, outbreaks, consecutive treatments with closantel and triclabendazole, probable source of flukes, Molinos, Salta Province, Argentina.

Castellano G., G.; Ullrich R., T.; Wackwitz, B.; Raggi S., A. **Composicion botanica de la dieta de alpacas (*Lama pacos* L.) y llamas (*Lama glama* L.) en dos estaciones del ano, en praderas altiplanicas de un sector de la Provincia de Parinacota, Chile. [Botanical composition of alpaca (*Lama pacos*) and llama (*Lama glama*) diets in two seasons of the year on highland ranges of Parinacota Province, Chile.]** *Agricultura Tecnica.* 2004; 64(4): 353-363. ISSN: 0365-2807. Note: In Spanish with an English summary.

Descriptors: alpacas, llamas, botanical composition of diets, grazing, winter dry and summer wet seasons, matter, dry matter, grazing, *Deschampsia cespitosa*, *Agrostis toluensis*, *Festuca nardifolia*, *Festuca orthophylla*, *Oxychloe*, *Oxychloe andina*, *Parastrephia lucida*, *Ranunculus uniflorus*, highland range of Parinacota, Chile.

Cebra, C.K.; Tornquist, S.J. **Assessment of the effects of epinephrine and insulin on plasma and serum biochemical variables in llamas and alpacas.** *American Journal of Veterinary Research.* 2004 Dec; 65(12): 1692-1696. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: llamas, alpacas, blood values, plasma, serum biochemical variables, effects of epinephrine and insulin.

Cebra, C.K.; Tornquist, S.J.; Jester, R.M.; Stelletta, C. **Assessment of the effects of feed restriction and amino acid**

supplementation on glucose tolerance in llamas. *American Journal of Veterinary Research.* 2004 Jul; 65(7): 996-1001. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: llamas, glucose tolerance, effects of feed restriction, amino acid supplementation.

Cebra, C.K.; Tornquist, S.J.; Jester, R.M.; Stelletta, C. **Assessment of the metabolic effects of hydrocortisone on llamas before and after feed restriction.** *American Journal of Veterinary Research.* 2004 Jul; 65(7): 1002-1005. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: llamas, comparison study, pre and post feed restriction, metabolic effects of hydrocortisone.

Cecchi, Teresa; Cozzali, Claudia; Passamonti, Paolo; Ceccarelli, Piero; Pucciarelli, Filippo; Gargiulo, Anna Maria; Frank, Eduardo-Nargiso; Renieri, Carlo. **Melanins and melanosomes from llama (*Lama glama* L.).** *Pigment Cell Research.* 2004; 17(3): 307-311. ISSN: 0893-5785.

Descriptors: adult pigmented Argentine llamas, analysis of melanins and melanosomes, hair and skin samples, eumelanins, pheomelanins, alkali-soluble melanins, eumelanosome shapes, black, reddish brown, dark brown, melanosomes at stages I, II, III, IV described.

Chavez-Velasquez, A.; Alvarez-Garcia, G.; Collantes-Fernandez, E.; Casas-Astos, E.; Rosadio-Alcantara, R.; Serrano-Martinez, E.; Ortega-Mora, L.M. **First report of *Neospora caninum* infection in adult alpacas (*Vicugna pacos*) and llamas (*Lama glama*).** *Journal of Parasitology.* 2004 Aug; 90(4): 864-866. ISSN: 0022-3395.

NAL call no.: QH547.I55

Descriptors: *Vicugna*, alpacas, llamas, *Neospora caninum*, protozoal disease, neosporosis, new host records, adult animals, seroprevalence, antibody detection, fluorescent antibody technique, immunoblotting, Western blotting, Peru.

Clauss, M.; Lendl, C.; Schramel, P.; Streich, W.J. **Skin lesions in alpacas and llamas with low zinc and copper status - a preliminary report.** *Veterinary Journal.* 2004; 167(3): 302-305. ISSN: 1090-0233.

NAL call no.: SF601.V484

Descriptors: alpacas, llamas, species differences, breed differences, sex differences, 13 llamas, 17 huacaya alpacas, 18 suri alpacas predisposition to skin lesions, dry scaly lesions, dietary deficiencies of copper (Cu) and zinc (Zn) deficiencies, fleece color, non-white colors, wool, Germany.

Coates, W.; Ayerza, R. **Comparison of llama fiber obtained from two production regions of Argentina.** *Journal of Arid Environments.* 2004 Sep; 58(4): 513-524. ISSN: 0140-1963.

NAL call no.: QH541.5.D4J6

Descriptors: llamas, alpacas, farmed animal species, arid zones, overgrazing, environmental degradation, animal production, animal breeding, fiber differences, fleece, color, fiber quality, selection criteria, sustainable agriculture, Argentina.

Coates, Wayne; Ayerza, Ricardo. **Fatty acid composition of llama muscle and internal fat in two Argentinian herds.** *Small Ruminant Research.* 2004; 52(3): 231-238. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: castrated llama male, muscle meat composition, internal fats, fatty acids, cholesterol and fats than beef, higher 3 fatty acid content, castration improves meat quality.

Cristofanelli, S.; Antonini, M.; Torres, D.; Polidori, P.; Renieri, C. **Meat and carcass quality from Peruvian llama (*Lama glama*) and alpaca (*Lama pacos*).** *Meat Science.* 2004 Mar; 66(3): 589-593. ISSN: 0309-1740.

NAL call no.: TX373.M4

Descriptors: llamas, alpacas, male animals, alternative livestock, growth, body weight, 25 months old at slaughter, longissimus dorsi, physical and chemical parameters of meat, postmortem changes. pH, nutritional value of meat, carcass quality and weight, dressing percentage, meat quality, moisture content, lipid content, protein content, ash content, cholesterol, water holding capacity, species comparison, Peru.

Abstract: An experiment based on 20 llama males and 40 alpaca males reared in Peru has been carried out with the aim to evaluate the live growth performances, carcass quality, the nutritional characteristics of meat from animals

slaughtered at 25 months of age, and to determine the physical and chemical parameters of meat obtained from these animals. The live body weights registered during the 25 months of the experiment were significantly lower in alpaca compared with llama. In llama carcasses were significantly higher both warm and cold carcass weight ($P < 0.001$) but dressing percentage was higher in alpacas ($P < 0.01$). The glycolytic fine-course was very similar both in llama and in alpaca muscle Longissimus Thoracis et Lumborum. Chemical composition of muscle Longissimus Thoracis et Lumborum taken from llama and alpaca carcasses was significantly different ($P < 0.01$) in ash content; cholesterol content was significantly higher ($P < 0.001$) in llama meat compared with alpaca.

De Nigris, Mariana E. **Guanaco and huemul in Patagonian hunter-gatherers diet.** *BAR International Series.* 2004; 1298: 11-37. Note: In English with an English and Spanish summary.

Descriptors: guanacos, huemul, *Hippocamelus bisulcus*, hunter gathers, food animals, South America.

DeWitt, S.F.; Bedenice, D.; Mazan, M.R. **Hemolysis and Heinz body formation associated with ingestion of red maple leaves in two alpacas.** *Journal of the American Veterinary Medical Association.* 2004 Aug 15; 225(4): 578-583. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: alpacas, eating red maple leaves, toxicity, blood effects, hemolysis, Heinz body formation, case reports.

Dixon, Amy. **Animal management at Auckland Zoo. 1. Clicker training llamas.** *IZN International Zoo News.* 2004 Jan-Feb; 51(1): 14-17; no. 330. ISSN: 0020-9155.

Descriptors: llamas, zoo animals, animal training techniques, care in captivity, clicker conditioning, Auckland Zoo, New Zealand.

Dong, Chang Sheng; Zhang, Qiao Ling; He, Xiao Yan; He, Jun Ping; Fan, Rui Wen; Geng, Jian Jun. **[Study on the chromosome of alpacas (*Lama pacos*)]** *Acta Veterinaria et Zootechnica Sinica.* 2004 Sep; 35(5): 594-596. ISSN: 0366-6964. Note: In Chinese with an English summary.

Descriptors: alpacas, cytogenetics, chromosomes, karyotypes, mutations.

Drew, M.L.; Johnson, L.; Pugh, D.; Navarre, C.B.; Taylor, I.T.; Craigmill, A.L. **Pharmacokinetics of ceftiofur in llamas and alpacas.** *Journal of Veterinary Pharmacology and Therapeutics.* 2004; 27(1): 13-20. ISSN: 0140-7783.

NAL call no.: SF915.J63

Descriptors: llamas, alpacas, ceftiofur sodium, pharmacokinetics, antibiotics, dosages based on other domestic species, disposition studies, intramuscular administration in llamas, intravenous and intramuscular administration in alpacas, serial timed blood sampling, similar to values in sheep and goats.

DuBois, W.R.; Prado, T.M.; Ko, J.C.H.; Mandsager, R.E.; Morgan, G.L. **A comparison of two intramuscular doses of xylazine-ketamine combination and tolazoline reversal in llamas.** *Veterinary Anaesthesia and Analgesia.* 2004; 31(2): 90-96. ISSN: 1467-2987.

NAL call no.: SF914.V47

Descriptors: llamas, animal restraint, surgery, analgesia, anesthetics, xylazine, tolazoline, ketamine, blood gases, blood pressure, arterial pressure, heart rate, conduction anesthesia, dosage effects, electrocardiograms, animal restraint, hemoglobin, intramuscular injection, respiration, pharmacodynamics, pharmacology.

Dunkel, B.; Del Piero, F.; Wotman, K.L.; Johns, I.C.; Beech, J.; Wilkins, P.A. **Encephalomyelitis from West Nile flavivirus in 3 alpacas.** *Journal of Veterinary Internal Medicine.* 2004 May-June; 18(3): 365-367. ISSN: 0891-6640.

NAL call no.: SF601.J65

Descriptors: alpacas, 3 animals, West Nile virus, viral encephalitis, case studies.

Graziotti, Guillermo H.; Palencia, Pablo; Delhon, Gustavo; Rivero, Jose Luis L. **Neuromuscular partitioning, architectural design, and myosin fiber types of the M. vastus lateralis of the llama (*Lama glama*).** *Journal of Morphology.* 2004; 262(2): 667-681. ISSN: 0362-2525.

URL: <http://www3.interscience.wiley.com/cgi-bin/fulltext/109627426/PDFSTART>

Descriptors: adult llamas, locomotory muscles, three fast myosin heavy chain isoforms (i.e., IIA, IIX, IIB), morphological and functional skeletal musculature, neuromuscular partitioning, architectural design, myosin fiber types, M. vastus lateralis, description of the muscle, Sihler's technique, femoral nerve, deep partitions, functional

adaptions.

Graziotti, G.H.; Rodriguez-Menendez, J.; Montesano, A.; Jalley, S.; Affricano, N.O.; Victorica, C.L. **Tipos fibrilares en diversos musculos de llama (*Lama glama*) de interes zootecnico. [Fibre types in different llama (*Lama glama*) muscles used as meat source.]** *InVet [Investigacion Veterinaria]*. 2004; 6(1): 21-27. ISSN: 1514-6634. Note: In Spanish with an English summary.

Descriptors: llamas, muscle fiber types, meat production, meat quality, biceps femoris, gluteus medius, rectus femoris and semitendinosus muscles, staining with myofibrillar adenosine triphosphatase, taste, juicyness, pH postmortem.

Gauly, M.; Erhardt, G; Dzapov, V. **Annual changes in serum levels of thyroid hormones in male llamas (*Lama glama*) and their correlation with reproduction parameters.** In: *Selected Research on Camelid Physiology and Nutrition*. The Camelid Publishers, Bakaner, India. 2004: 186-194. ISBN: 8190114123.

NAL call no.: SF401.C2S46 2004

Descriptors: male llamas, male fertility, factors affecting reproductive efficiency, reproductive performance, blood chemistry, ejaculate volume, semen, spermatozoa, environmental temperature, hormone secretion, seasonal variation, thyroid gland, thyroxine, triiodothyronine.

Gauly, M. **Tierschutzaspekte bei der Haltung Neuweltkameliden. [Aspects of animal welfare in South American Camelids husbandry.]** *DTW (Deutsche Tieraerztliche Wochenschrift)*. 2004; 111(3): 127-130. ISSN: 0341-6593. Note: In German.

NAL call no.: 41.8 D482

Descriptors: llamas, alpacas, animal welfare, guidelines development, husbandry, feeding, lack of basic knowledge about requirements, veterinary care, education needed, Germany.

Gonzalez, F.; Smulders, F.J.M.; Paulsen, P.; Skewes, O.; Konig, H.E. **Anatomical investigations on meat cuts of guanacos (*Lama guanicoe*, Muller, 1776) and chemical composition of selected muscles.** *Wiener Tieraerztliche Monatsschrift*. 2004; 91(3): 77-84. ISSN: 0043-535X. Note: In English with a German summary.

NAL call no.: 41.8 T345

Descriptors: 70 young male guanacos, wild animals, animal anatomy, body fat, carcass composition and weight, carcass yield, chemical composition, longissimus dorsi muscle, meat composition, meat cuts, meat quality, meat yield, saturated fatty acids, Tierra del Fuego, Chile.

Hunter, Robert P.; Isaza, Ramiro; Koch, David E.; Dodd, Charles C.; Goatly, Marie A. **Moxidectin plasma concentrations following topical administration to llamas (*Lama glama*) and alpacas (*Lama pacos*).** *Small Ruminant Research*. 2004; 52(3): 275-279. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: llamas, alpacas, extra label usage of pharmaceuticals, pharmacokinetic parameters between species, study of pour-on moxidectin, clipped along dorsal midline, serial blood sampling post dosing, variability in absorption, moxidectin not well absorbed, no adverse effects, pharmacokinetic parameters not determined.

Hunter, R.P.; Isaza, R.; Koch, D.E.; Dodd, C.C.; Goatly, M.A. **The pharmacokinetics of topical doramectin in llamas (*Lama glama*) and alpacas (*Lama pacos*).** *Journal of Veterinary Pharmacology and Therapeutics*. 2004; 27(3): 187-189. ISSN: 0140-7783.

NAL call no.: SF915.J63

Descriptors: llamas, alpacas, avermectin, doramectin, avermectin enectocide, milbecycin, moxidectin, plasma concentration, pharmacokinetics, topical treatments.

Janmaat, A.; Choy, J.L.; Currie, B.J. **Melioidosis in an alpaca (*Lama pacos*).** *Australian Veterinary Journal*. 2004 Oct.; 82(10): 622-623. ISSN: 0005-0423.

NAL call no.: 41.8 AU72

Descriptors: alpaca, *Lama pacos*, disease, *Burkholderia* species, bacterial disease similar to glanders.

Kalicki, M. **Powikania ciąży i porodu u ssakow z gdanskiego zoo w latach 1995-1999. [Pregnancy complications and cases of dystocia in mammals in Gdansk Zoo in 1995-1999.]** *Zycie Weterynaryjne*. 2004; 79(3): 152-153.

ISSN: 0137-6810. Note: In Polish.

NAL call no.: SF604.Z9

Descriptors: captive zoo animals, includes 1 pony, 1 zebra, 1 llama, 2 dromedaries, 687 mammalian pregnancies, spontaneous miscarriage, dystocia, pregnancy complications.

Knight, A.P. **Plant poisoning of small ruminants.** In: *Proceedings of the Thirty-Seventh Annual Conference, American Association of Bovine Practitioners, Forth Worth, Texas, City, USA, 23-25 September, 2004.* 2004: 127-134. ISSN: 0743-0450.

NAL call no.: SF961.A5

Descriptors: sheep, goats, llamas, alpacas, grazing and browsing toxic plants, grazing behavior, toxic plant danger when overgrazing, drought, access to high levels of toxic plants, oxalates, nitrates, cyanogenic glycosides, photosensitizing compounds, *Halogeton glomeratus*, *Cicuta douglasii*, *Conium maculatum*, *Eupatorium rugosum*, *Xanthium*, *Karwinskia*, North America.

Kraus, M.S.; Calvert, C.A.; Spier, A.W.; Meurs, K.M.; Anderson, D.E. **Determination of electrocardiographic parameters in healthy llamas and alpacas.** *American Journal of Veterinary Research.* 2004 Dec.; 65(12): 1719-1723. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: llamas, alpacas, healthy animals, cardiac scanning, electrocardiographic parameters.

Kosal, M.E.; Anderson, D.E. **An unaddressed issue of agricultural terrorism: A case study on feed security.** *Journal of Animal Science.* 2004; 82(11): 3394-3400. ISSN: 0021-8812.

NAL call no.: 49 J82

Descriptors: alpacas, feed contamination, case study, potential biosecurity concerns, mid-west, United States.

Kutzler, Michelle A.; Baker, Rocky J.; Mattson, Donald E. **Humoral response to West Nile virus vaccination in alpacas and llamas.** *Journal of the American Veterinary Medical Association.* 2004; 225(3): 414-416. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: alpacas, llamas, horses, equine West Nile virus vaccine, humoral responses, clinical trial, vaccine intervals varied, results indicate the vaccine is safe.

Kutzler, M.A.; Bildfell, R.J.; Gardner-Graff, K.K.; Baker, R.J.; Delay, J.P.; Mattson, D.E. **West Nile virus infection in two alpacas.** *Journal of the American Veterinary Medical Association.* 2004 Sep. 15; 225(6): 921-924. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: alpacas, viral diseases, West Nile virus, diagnosis, symptoms, case reports.

Lenghaus, C.; O'Callaghan, M.G.; Rogers, C. **Coccidiosis and sudden death in an adult alpaca (*Lama pacos*).** *Australian Veterinary Journal.* 2004 Nov.; 82(11): 711-712. ISSN: 0005-0423.

NAL call no.: 41.8 AU72

Descriptors: adult alpaca, *Lama pacos*, coccidiosis, disease pathology, case report.

Leroy, J.L.; Flahou, T.; Moerloose, K.; de Kruif, A. **De voortplanting bij de llama- en de alpacamerrie. [The reproduction in llama and alpaca mares.]** *Vlaams Diergeneeskundig Tijdschrift.* 2004; 73(5): 310-316. ISSN: 0303-9021. Note: In Dutch with an English summary.

Descriptors: llamas, alpacas, females, care in those imported into Europe, veterinary care, reproduction and breeding, assisted reproductive techniques, pregnancy, pregnancy diagnosis, reproductive efficiency, reproductive performance, Belgium.

Long, P. **A practitioner approach to llama and alpaca nutrition.** In: *Selected Research on Camelid Physiology and Nutrition.* The Camelid Publishers, Bakaner, India. 2004; 747-749. ISBN: 8190114123.

NAL call no.: SF401.C2S46 2004

Descriptors: alpacas, llamas, animal husbandry, animal nutrition, body condition, nutrient requirements, wool producing animals, Arab countries.

Majewska, M.; Panasiwicz, G.; Klisch, K.; Olivera, L.; Abd-Elnaeim, M.M.; Borkowski, K.; Szafranska, B. **Pregnancy-associated glycoproteins (PAG) in camelids.** *Reproduction in Domestic Animals*. 2004; 39(4): 282-283. ISSN: 0936-6768. Note: 8th Annual Conference of the European Society for Domestic Animal Reproduction (ESDAR), Warsaw, Poland; September 23-25, 2004.

NAL call no.: SF105.A1Z8

Descriptors: camelids, camels, llamas, alpaca, reproductive biochemistry, glycoproteins, pregnancy, PAG gene.

Mate, M.L.; Di Rocco, F.; Zambelli, A.; Vidal-Rioja, L. **Mitochondrial DNA structure and organization of the control region of South American camelids.** *Molecular Ecology Notes*. 2004; 4(4): 765-767. ISSN: 1471-8278.

NAL call no.: QH541.15.M632

Descriptors: llamas, alpacas, vicunas, guanaco, mitochondrial DNA molecular organization of control region, conserved sequence blocks, potential as a molecular marker to infer data for camelid genetic relationships, population diversity tool.

McGregor, B.A.; Butler, K.L. **Sources of variation in fibre diameter attributes of Australian alpacas and implications for fleece evaluation and animal selection.** *Australian Journal of Agricultural Research*. 2004; 55(4): 433-442. ISSN: 0004-9409.

NAL call no.: 23 AU783

Descriptors: *Lama pacos*, alpacas, breeds, individual variations, fleece fiber quality, gender, age, body weight, selection criteria, repeatability, geographical variation, regression analysis, multivariate analysis, correlation, algorithms, restricted maximum likelihood method, prediction, models, Australia.

Medina, Mirta A.; Fernandez, Francisco; Saad, Silvia; Rebuffi, Gustavo; Yapur, Jose. **Inmunoglobulinas G de Cadenas pesadas en la leche de los camelidos sudamericanos. [Heavy-chain IgG in the milk of South American camelids.]** *Mastozoologia Neotropical*. 2004; 11(1): 19-26. ISSN: 0327-9383. Note: In Spanish with an English and Spanish summary.

Descriptors: camelids, llama, vicuna, alpaca, guanaco, conventional IgG, IgG with two heavy chains, identify types of IgG in milk, PAGE-SDS, immunoblotting, immunoblotting assays, both types of IgG found.

Mercado, E.C.; Rodriguez, S.M.; Elizondo, A.M.; Marcoppido, G.; Parreno, V. **Isolation of shiga toxin-producing *Escherichia coli* from a South American camelid (*Lama guanicoe*) with diarrhea.** *Journal of Clinical Microbiology*. 2004; 42(10): 4809-4811. ISSN: 0095-1137.

URL: <http://jcm.asm.org/cgi/content/abstract/42/10/4809>

NAL call no.: QR46.J6

Descriptors: 2 year old guanaco, bacterial infection, clinical picture, case report, bacterial toxins, diagnosis, diarrhea, genes, hemolysins, lipopolysaccharides, PCR, *Escherichia coli*, O26:H1 1 serotype, toxicity, Argentina.

Middleton, J.R. **Haematology of South American camelidae.** In: *Selected Research on Camelid Physiology and Nutrition*. The Camelid Publishers, Bakaner, India. 2004: 400-408. ISBN: 8190114123.

NAL call no.: SF401.C2S46 2004

Descriptors: Bactrian camels, alpacas, vicunas, guanacos, llamas, blood chemistry, blood disorders, hematocrit, anemia, blood cells morphology, basophils, bone marrow, dissolved oxygen, eosinophilia, eosinophils, erythrocyte count, erythrocytes, erythropoietin, transferrin, hematology, hemoglobin, iron deficiency anemia, leukocyte count, lymphocytes, monocytes, morphology, neutrophils, normal values, platelets, South America.

Miragaya, M.H.; Aba, M.A.; Capdevielle, E.F.; Ferrer, M.S.; Chaves, M.G.; Rutter, B.; Aguero, A. **Follicular activity and hormonal secretory profile in vicuna (*Vicugna vicugna*).** *Theriogenology*. 2004 Feb.; 61(4): 663-671. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: vicunas, *Vicugna vicugna*, ovarian follicles, follicular development, diameter, hormones, secretory profile.

Nawrocki, M.A.; Lincoln, J.D.; Tibary, A. **Surgical management of unilateral ectopic hydroureter and hydronephrosis in a juvenile alpaca.** *Journal of Camel Practice and Research*. 2004; 11(2): 119-123. ISSN: 0971-

6777.

NAL call no.: SF997.5.C3J68

Descriptors: female alpaca, 9 months old, ectopic ureter and hydronephrosis, incontinence, ultrasonographic examination, intravenous pyelogram, excretory urogram, left nephrectomy and ureterectomy surgical procedures, uneventful recovery.

Odbileg, R.; Lee, SungIl; Yoshida, R.; Chang, KyungSoo; Ohashi, K.; Sugimoto, C.; Onuma, M. **Cloning and sequence analysis of llama cytokines related to cell-mediated immunity.** *Veterinary Immunology and Immunopathology.* 2004; 99(1/2): 1-10. ISSN: 0165-2427.

NAL call no.: SF757.2.V38

Descriptors: llamas, pigs, cattle, amino acid sequences, cell mediated immunity, complementary DNA, cytokines, DNA cloning, genes, interferon, interleukin 12, interleukin 12p35, interleukin 12p40, interleukin 2, nucleotide sequences, open reading frames, species differences, T lymphocytes.

Oevermann, A.; Pfyffer, G.E.; Zanolari, P.; Meylan, M.; Robert, N. **Generalized tuberculosis in llamas (*Lama glama*) due to *Mycobacterium microti*.** *Journal of Clinical Microbiology.* 2004; 42(4): 1818-1821.

URL: <http://jcm.asm.org/cgi/content/full/42/4/1818>

NAL call no.: QR46.J6

Descriptors: 2 llamas, caseous nodules, acid fast bacilli in various organs, tuberculosis, spoligotyping, *Mycobacterium microti* (vole type), infectivity, post mortem study.

O'Rourke, Jennifer L.; Callan, Robert J.; Van Metre, David C. **West Nile virus meningoencephalomyelitis in alpacas.** *Journal of Veterinary Internal Medicine.* 2004; 18(3): 396. ISSN: 0891-6640. Note: 22nd Annual American College of Veterinary Internal Medicine (ACVIM) Forum, Minneapolis, MN, USA; June 9-12, 2004.

NAL call no.: SF601.J65

Descriptors: alpacas, West Nile virus infection, neural affects, meningoencephalomyelitis, neural coordination effects.

Parreno, V.; Bok, K.; Fernandez, F.; Gomez, J. **Molecular characterization of the first isolation of rotavirus in guanacos (*Lama guanicoe*).** *Archives of Virology.* 2004 Dec; 149(12): 2465-2471. ISSN: 0304-8608.

NAL call no.: 448.3 AR23

Descriptors: phylogeny, neonates, rotavirus causing diarrhea, molecular structure of virus, first record of guanco pathogen, strain G8, strain GRV Arg-RioNegro 98, strain GRV Arg-Chubut 99, strain P (14-), strain P (1-) Argentina.

Patel, J.H.; Kosheluk, C.; Nation, P.N. **Renal teratoma in a llama.** *Canadian Veterinary Journal. [La Revue Veterinaire Canadienne].* 2004 Nov; 45(11): 938-940. ISSN: 0008-5286. Note: In English with a summary in French.

NAL call no.: 41.8 R3224

Descriptors: llamas, renal teratoma, diseases, diagnosis, treatment, case study.

Pugh, D.G.; Walldridge, B.M. **Goat and llama trace mineral nutrition.** In: *Proceedings of the Thirty Seventh Annual Conference, American Association of Bovine Practitioners, Forth Worth, Texas, City, USA, 23-25 September, 2004.* 2004: 112-113.

NAL call no.: SF961.A5

Descriptors: goats, llamas, mineral nutrition, nutritional edema, trace element deficiencies, copper, selenium, zinc.

Pugh, D.G.; Walldridge, B.; Wenzel, J.G.W. **Trace mineral nutrition in llamas.** In: *Selected Research on Camelid Physiology and Nutrition.* The Camelid Publishers, Bikaner, India. 2004: 728-737. ISBN: 8190114123.

NAL call no.: SF401.C2S46 2004

Descriptors: llamas, trace mineral nutrition, nutrient requirements, mineral deficiency diseases, copper, zinc, iodine, iron, selenium, clinical aspects, dietary minerals, disease prevention, mineral nutrition, reviews.

Ramos Vara, J.A.; Loiacono, C.M.; Williams, F. III; Pardo, I.; Lakritz, J. **Pulmonary neoplasia in two llamas (*Lama glama*).** *Veterinary Pathology.* 2004; 41(5): 520-523. ISSN: 0300-9858.

NAL call no.: 41.8 P27

Descriptors: llamas, pulmonary tumors, description of the types of cells and nodules, neoplasms, adenosquamous

carcinoma, clinical aspects, histopathology, diagnosis, case reports.

Ray, W.M.; Gustafson, S.B.; Huber, M.J. **Tibial plateau leveling osteotomy in a llama with a ruptured cranial cruciate ligament.** *Journal of the American Veterinary Medical Association.* 2004 Dec 1; 225(11): 1739-1742. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: llama, case study, ruptured cranial cruciate ligament, treatment, tibial plateau leveling osteotomy, recovery.

Reggiani, C.; Mascarello, F. **Fibre type identification and functional characterization in adult livestock animals.** In: *Muscle Development of Livestock Animals: Physiology, Genetics and Meat Quality.* 2004; 39-68. CABI Publishing, Wallingford, UK. ISBN: 0851998119.

NAL call no.: SF768.M87 2004

Descriptors: llamas, cattle, sheep, goats, pigs, horses, adult animals, livestock, myofibrils, muscle contraction, muscle fatigue, muscle fibers, muscle physiology.

Rojas, X.; Munoz, S.; Otto, B.; Perez, B.; Nielsen, K. **Utilizacion de los test de Fluorescencia Polarizada (FP) y Elisa de Competencia (C-Elisa) en el diagnostico de brucelosis de camelidos. [The use of polarized fluorescence as say (PF) and competitive ELISA test (C-ELISA) for the diagnosis of brucellosis in South American camelids.]** *Archivos de Medicina Veterinaria.* 2004; 36(1): 59-64. ISSN: 0301-732X. Note: In Spanish with an English summary.

NAL call no.: SF604.A75

Descriptors: alpacas, llamas, *Brucella*, bacterial disease, diagnostic techniques, detection of antibodies, assays, camelid sera, fluorescence polarization assay (PF), competitive ELISA (C-ELISA), rose Bengal (RB), seroagglutination (SAT), complement fixation (CF) tests.

Sarno, Ronald J.; Villalba, Lilian; Bonacic, Cristian; Gonzalez, Benito; Zapata, Beatriz; Mac Donald, David W.; O'Brien, Stephen J.; Johnson, Warren E. **Phylogeography and subspecies assessment of vicunas in Chile and Bolivia utilizing mtDNA and microsatellite markers: Implications for vicuna conservation and management.** *Conservation Genetics.* 2004; 5(1): 89-102. ISSN: 1566-0621.

Descriptors: wild vicunas, semi-captivity in Peru, economic utilization, large scale rearing practices in Argentina, Bolivia and Chile, impact of systems on various aspects of the animals, distribution and validity of recognized subspecies, molecular genetic variation and diversity, restrict gene flow with isolation and distance, ensure gene flow in intensive rearing.

Sartin, E.A.; Crowe, D.R.; Whitley, E.M.; Treat, R.E., Jr.; Purdy, S.R.; Belknap, E.B. **Malignant neoplasia in four alpacas.** *Journal of Veterinary Diagnostic Investigation.* 2004; 16(3): 226-229. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: alpacas, B-cell lymphosarcoma, neuroendocrine neoplasm, clinical picture, postmortem examination, abdominal mass, thoracic masses, diagnosis with immunohistochemical stains, case reports.

Saulez, M.N.; Cebra, C.K.; Valentine, B.A. **Necrotizing hepatitis associated with enteric salmonellosis in an alpaca.** *Canadian Veterinary Journal.* 2004; 45(4): 321-323. ISSN: 0008-5286. In English with a French summary.

NAL call no.: 41.8 R3224

Descriptors: 1 year old alpaca, *Salmonella typhimurium*, isolated from feces, salmonellosis, clinical aspects, anorexia, weight loss, liver biopsies, hepatitis, differential diagnosis, disease control, antibiotic treatment, fluid therapy, blood chemistry, case report, hematology, histopathology.

Serrano Martinez, E.; Collantes Fernandez, E.; Rodriguez Bertos, A.; Casas Astos, E.; Alvarez Garcia, G.; Chavez Velasquez, A.; Ortega Mora, L.M. **Neospora species-associated abortion in alpacas (*Vicugna pacos*) and llamas (*Lama glama*).** *Veterinary Record (London).* 2004 Dec 4; 155(23): 748-749. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: alpacas, *Vicugna pacos*, llamas, *Lama glama*, abortion associated with *Neospora* sp.

Spinelli, Silvia; Desmyter, Aline; Frenken, Leon; Verrips, Theo; Tegoni, Mariella; C ambillau, Christian. **Domain swapping of a llama VHH domain builds a crystal-wide beta-sheet structure.** *FEBS Letters*. 2004; 564(1-2): 35-40. ISSN: 0014-5793.

NAL call no.: QD415.F4

Descriptors: camelids, llamas, VHH-R9 heavy chain functional antibodies, description of the structure, domain swapping, molecular properties, hapten, immunoglobulin proteins.

Teague, L. **Arriving with alpacas.** *AgVentures*. 2004 Apr-May; 8(2): 6-8.

NAL call no.: S441.A475

Descriptors: alpacas, transport, care, handling, personal story.

Tichit, M.; Ingrand, S.; Moulin, C.H.; Cournut, S.; Lasseur, J.; Dedieu, B. **Analyser la diversite des trajectoires productives des femelles reproductrices: interets pour modeliser le fonctionnement du troupeau en élevage allaitant.** [Analysis of the diversity of breeding female productive trajectories: interest for modelling the functioning of suckling herds.] *Productions Animales* (Paris). 2004; 17(2): 123-132. ISSN: 0990-0632. Note: In French.

Descriptors: cattle, sheep, llamas, variable animal productivity, production trajectory herd model, based on 6 case studies, breeding and replacement practices, decreasing or increasing within herd diversity of female productive trajectories, consequences for modelling herd functioning are reviewed.

Tichit, Muriel; Hubert, Bernard; Doyen, Luc; Genin, Didier. **A viability model to assess the sustainability of mixed herds under climatic uncertainty.** *Animal Research*. 2004; 53(5): 405-417. ISSN: 1627-3583.

Descriptors: llamas, sheep, herd diversification strategies, breeding rate control, unpredictable environmental conditions, dynamic mathematical model, different levels of care practices, efficiency measurements, animal production system sustainability, pastoral system management in arid conditions, Bolivia.

Ueda, J.; Cebra, C.K.; Tornquist, S.J. **Assessment of the effects of exogenous long-acting insulin on glucose tolerance in alpacas.** *American Journal of Veterinary Research*. 2004 Dec; 65(12): 1688-1691. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: alpacas, glucose metabolism, glucose tolerance, effects of exogenous long-acting insulin.

Van Hoogmoed, L.M.; Drake, C.M.; Snyder, J.R. **In vitro investigation of the effects of nonsteroidal anti-inflammatory drugs, prostaglandin E2, and prostaglandin F2 alpha on contractile activity of the third compartment of the stomach of llamas.** *American Journal of Research*. 2004 Feb.; 65(2): 220-224. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: NSAIDS, prostaglandin E3, prostaglandin F2 alpha, in vitro testing, effects on contractile activity, third stomach.

Varney, K. **Quarterly review of diagnostic cases - October to December 2003.** *Surveillance Wellington*. 2004; 31(1): 21-25. ISSN: 0112-4927.

Descriptors: alpacas, cats, cattle, deer, dogs, horses, pigs, rabbits, sheep, protozoa, bacteria, viruses, various types of animal diseases, clinical aspects, diagnosis, diagnostic techniques, case reports.

Vaughan, J.L. **Eradication of the camelid biting louse, *Bovicola breviceps*.** *Australian Veterinary Journal*. 2004; 82(4): 218-219. ISSN: 0005-0423.

NAL call no.: 41.8 AU72

Descriptors: alpaca, llama, sheep, camelid biting louse, *Bovicola breviceps*, common parasite, pesticide, egg counts, shearing, treatment, Extinosad (spinosad 25 g/l spinosad suspension concentrate) with wetting agent, efficacy of treatment.

Vaughan, J.L.; Macmillan, K.L.; D'Occhio, M.J. **Ovarian follicular wave characteristics in alpacas.** *Animal Reproduction Science*. 2004; 80(3-4): 353-361. ISSN: 0378-4320.

NAL call no.: QP251.A5

Descriptors: alpacas, study of ovarian follicular growth characteristics, intervals between, successive large follicles in

unmated females, non-pregnant and non-lactating adult alpacas, ultrasound 46-100 days, wave pattern, diameters measured, possible use for optimal mating times.

Waldrige, B.M.; Duran, S.H.; Ravis, W.R.; Paxton, R.; Herdt, T.H.; Pugh, D.G. **Pharmacokinetics of subcutaneous selenium in adult llamas.** *Veterinary Therapeutics Research in Applied Veterinary Medicine*. 2004 Winter; 5(4): 272-278. ISSN: 1528-3593.

NAL call no.: SF601.V4745

Descriptors: llamas, subcutaneous selenium, pharmacokinetics, deficiency diseases, dietary mineral supplements.

Wauters, J.J.M.; Duchi, N.; Guevara, P.; Onate, W.; Castillo, P.; Lopez, J.; de Wilde, R. **Comparison of the digestibility of paja de paramo and barley straw between sheep (*Ovis aries*), llamas (*Lama glama*) and alpacas (*Lama paco*).** In: *Selected Research on Camelid Physiology and Nutrition*. The Camelid Publishers, Bakaner, India. 2004: 766-769. ISBN: 8190114123.

NAL call no.: SF401.C2S46 2004

Descriptors: sheep, llamas, alpacas, animal nutrition, forage, feed digestibility study, barley straw, *Hordeum vulgare*, lignin, nutritive value, species differences, *Calamagrostis rigida*, *Festuca dolichophylla*, *Festuca humilior*, *Muhlenbergia angustata*.

Webb, A.I.; Baynes, R.E.; Craigmill, A.L.; Riviere, J.E.; Haskell, S.R.R. **Drugs approved for small ruminants.** *Journal of the American Veterinary Medical Association*. 2004; 224(4): 520-523. ISSN: 0003-1488.

NAL call no.: 41.8 AM3A

Descriptors: alpacas, deer, goats, llamas, sheep, drugs for small ruminants, pharmacology, regulations.

Wernery, U.; Kaaden, O.R. **Foot-and-mouth disease in camelids: a review.** *Veterinary Journal*. 2004; 168(2): 134-142. ISSN: 1090-0233.

NAL call no.: SF601.V484

Descriptors: South American camelids, dromedaries, Bactrian camels, foot and mouth diseases, infectability, disease transmission risks, dromedaries may contract the disease in experimental infection and close contact with infected animals, camels not FMDV carriers, llamas and alpacas infected by direct contact, not very susceptible and no risk of transmitting to susceptible species, Bactrians have similar lesions, but no samples have been positive, recommend further research in camelids.

Yaeger, M.; Yoon, K.J.; Schwartz, K.; Berkland, L. **West Nile virus meningoencephalitis in a Suri alpaca and Suffolk ewe.** *Journal of Veterinary Diagnostic Investigation*. 2004; 16(1): 64-66. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: alpacas; Suffolk ewe sheep, clinical signs, llama symptoms, torticollis, hyperesthesia, ataxia, recumbency, altered mentation, ewe symptoms, rapidly progressive illness of ataxia and convulsions, diffuse, lymphoplasmacytic meningoencephalitis with focal gliosis meningoencephalitis, microscopic brain lesions, diagnosis, diagnostic techniques, West Nile virus, immunohistochemistry, polymerase chain reaction, PCR, first confirmed case in camelids, New Hampshire, United States.

Young, Julie K.; Franklin, William L. **[Activity budget patterns in family-group and solitary territorial male guanacos.]** *Revista Chilena de Historia Natural*. 2004; 77(4): 617-625. ISSN: 0716-078X. Note: In Spanish with an English and Spanish summary.

NAL call no.: QH119.R48

Descriptors: male guanacos, behavioral patterns, aggressive and miscellaneous, territorial, mata barrosa, *Mulinum spinosum*, resources defended, Torres del Paine National Park, Chile.

Young, Julie K.; Franklin, William L. **Territorial fidelity of male guanacos in the patagonia of southern Chile.** *Journal of Mammalogy*. 2004; 85(1): 72-78. ISSN: 0022-2372. Note: In English with an English and Spanish summary.

Descriptors: territorial male guanacos, 10 year study, resource defense polygyny, fluid movement of females between male territories, data on various territory parameters, type, location, size, usage, known age males, solo males, family group males, patterns relevant to management and conservation, Torres del Paine National Park, Chile.

Zapata, B.; Gimpel, J.; Bonacic, C.; Gonzalez, B.A.; Riveros, J.L.; Ramirez, A.M.; Bas, F.; Macdonald, D.W. **The effect of transport on cortisol, glucose, heart rate, leukocytes and body weight in captive-reared guanacos (*Lama guanicoe*).** *Animal Welfare*. 2004 Nov; 13(4): 439-444. ISSN: 0962-7286.

NAL call no.: HV4701.A557

Descriptors: captive animal transport, guanacos, *Lama guanicoe*, travel stress factors tested, cortisol, glucose, heart rate, leukocytes, body weight, animal welfare concerns.

Zhang, Qiao Ling; Dong, Chang Sheng; He, Jun Ping; He, Xiao Yan. **[Research progress on the study of the chromosomes of alpacas.]** *Journal of Economic Animal*. 2004; 8(2): 115-121. ISSN: 1007-7448. Note: In Chinese with an English summary.

Descriptors: alpacas, animal breeding, sex determination, chromosomes, genetic variance, inheritance, physiology, reviews.

2003

Abbas, S.F.; Milad, I.S. **Performance and some body measurements as a management tool of imported llama (*Lama glama*) under Libyan condition.** *Assiut Journal of Agricultural Sciences*. 2003; 34(5): 265-274. ISSN: 1110-0486. Note: In English with an Arabic summary.

NAL call no.: S540.A2A7

Descriptors: llamas, age differences, birth, body measurements and weight, equations, mortality, environmental effects on birthing and mortality, seasonal differences, sex differences, Libya.

Abdouslam, O.E.; Al Izzi, S.A.; Al Bassam, L.S.; Azwai, S.M. **Effect of anthelmintic treatment on haematological and coagulation parameters in llamas (*Lama glama*) infected with gastrointestinal parasites.** *Journal of Camel Practice and Research*. 2003; 10(2): 149-152. ISSN: 0971-6777.

NAL call no.: SF997.5.C3J68

Descriptors: llamas, 5 males, 5 females, fecal analysis, parasitic nematodes, *Nematodirus* sp. (n=6 cases), *Capillaria* sp. (n=1), *Strongyloides* sp (n=1), capillariasis, strongyloidiasis, disease control, drug therapy with albendazole, efficacy of drug, pre and post treatment blood parameters, erythrocyte count, hematocrit, hematology, hemoglobin.

Abdouslam, O.E.; Al Bassam, L.S.; Al Izzi, S.A.; Azwai, S.M. **Prevalence of external and internal parasites in llamas (*Lama glama*) at Surman Park in Libya.** *Journal of Camel Practice and Research*. 2003; 10(1) : 61-65. ISSN: 0971-6777.

NAL call no.: SF997.5.C3J68

Descriptors: 83 adult llamas, 12 crias, parasite prevalence, parasitoses, fecal examination, disease survey, capillariasis, strongyloidiasis, trichuriasis, *Capillaria*, *Eimeria*, *Nematodirus*, *Strongyloides*, *Trichostrongyle*, *Trichuris*, *Faciola hepatica*, significance of finding discussed, zoological gardens, Surman Park, Libya.

Aco, E. **Characteristics of ovarian follicle development in domestic animals.** *Reproduction in Domestic Animals*. 2003; 38(4): 240-246. ISSN: 0936-6768.

NAL call no.: SF105.A1Z8

Descriptors: llamas, buffalo, Bactrian camels, dromedary camels, cattle, fowls, sheep, goats, horses, pigs, gonadotropins, livestock, estrous cycle, ovarian follicle development, dominant follicles and litter size, ovulation, tool to manage reproduction, species differences.

Aller, Juan F.; Rebuffi, G.E.; Cancino, A.K.; Alberio, R.H. **Fetal mortality diagnosis by ultrasound in the vicuna (*Vicugna vicugna*).** *Reproduction Fertility and Development*. 2003; 15(1-2): 125-128. ISSN: 1031-3613.

NAL call no.: QP251.R47

Descriptors: vicuna, semi-captive animals, pregnancy, fetal mortality in utero, transrectal ultrasound diagnosis, Abra Pampa Experimental Farm of Altitude, Argentina.

Aller, J.F.; Rebuffi, G.E.; Cancino, A.K.; Alberio, R.H. **Influencia de la criopreservacion sobre la motilidad, viabilidad y fertilidad de espermatozoides de llama (*Lama glama*). [Influence of cryopreservation on the motility, viability and fertility of llama (*Lama glama*) spermatozoa.]** *Archivos de Zootecnia*. 2003; 52(197): 15-23.

ISSN: 0004-0592. Note: In Spanish.

NAL call no.: 49 AR22

Descriptors: llama, cryopreservation of spermatozoa, effects on motility and viability of sperm, artificial insemination with frozen semen, compared to fresh semen, lower fertility rates with frozen semen, females born and adapted to Argentina n Puna.

Anderson, D.E.; Silveira, F. **Effect of age and gender on serum concentration of triiodothyronine and tetraiodothyronine (thyroxine) in alpacas (*Lama pacos*).** *Journal of Animal and Veterinary Advances*. 2003; 2(11): 626-629. ISSN: 1680-5593.

Descriptors: alpacas, thyroid hormone concentrations, age and gender comparison study, venous blood samples, radioimmunosassay, totals and free concentrations of T4, T3, age and gender effects are significant.

Ansaloni, F.; Pyszny, F. **Allevare alpaca e vendere maglioni per migliorare il reddito. [Rear alpaca and sell sweaters to enhance income.]** *Informatore Agrario*. 2003; 59(17): 33-35. ISSN: 0020-0689. Note: In Italian.

Descriptors: alpacas, angora goats, processing fiber, spinning and production of garments, direct marketing of farm products, diversification, economic analysis, farm holidays and tourism, farm income, Tiber Valley, Umbria, Italy.

Bank, Michael S.; Sarno, Ronald J.; Franklin, William L. **Spatial distribution of guanaco mating sites in southern Chile: conservation implications.** *Biological Conservation*. 2003 Aug; 112(3): 427-434. ISSN: 0006-3207.

NAL call no.: S900.B5

Descriptors: llamas, guanacos, nutrition, diets, habitat preference, habitat use, behavior, habitat distribution, reproduction, predators, predation effects on mating sites, conservation, Chile.

Bartlett, G.R.; Dart, A.J.; Dart, C.M. **Surgical repair of a coxofemoral luxation in an alpaca.** *Australian Veterinary Journal*. 2003; 81(5): 271-272. ISSN: 0005-0423.

NAL call no.:41.8 AU72

Descriptors: alpaca, lameness, bone fractures, coxofemoral luxation, fracture fixation, surgery, surgical operations, case report, New South Wales, Australia.

Beldomenico, P.M.; Uhart, M.; Bono, M. F.; Marull, C.; Baldi, R.; Peralta, J. L. **Internal parasites of free-ranging guanacos from Patagonia.** *Veterinary Parasitology*. 2003; 118(1-2): 71-77. ISSN: 0304-4017.

NAL call no.: SF810.4.V4

Descriptors: guanaco populations, 80% reduction, massive mortality, starvation, disease, parasites, fecal analysis, *Nematodirus* spp., *Marshallagia* spp., *Trichuris tenuis* spp. and *Eimeria* spp. histopathology showed *Sarcocystis* spp. in muscle and fascia cysts, *Dictyocaulus filarial* and *Moniezia expansa* diseases may be from sheep, Cabo Dos Bahias Wildlife Reserve, Chubut, Argentina.

Boileau, Melanie J.; Streeter, Robert N.; Step, Douglas L.; Washburn, Kevin E. **Colocolic intussusception in a 12-year-old llama.** *Journal of Veterinary Internal Medicine*. 2003; 17(6): 937-939. ISSN: 0891-6640.

NAL call no.: SF601.J65

Descriptors: llama, adult animal, ingestion and assimilation, colocolic intussusception.

Bonacic, C.; MacDonald, D.W.; Villouta, G. **Adrenocorticotrophin-induced stress response in captive vicunas (*Vicugna vicugna*) in the Andes of Chile.** *Animal Welfare* (Wheathampstead). 2003 Aug; 12(3): 369-385. ISSN: 0962-7286.

NAL call no.: HV4701.A557

Descriptors: captive vicunas, behavior, animal stress, normal values, endocrine system physiology, corticotrophin, calibration, hematocrit, neutrophil to lymphocyte ratios, leukocytes, blood picture, blood composition, blood glu cose, animal welfare issues, animal physiology, species differences, Chile.

Bonacic, C.; MacDonald, D.W. **The physiological impact of wool-harvesting procedures in vicunas (*Vicugna vicugna*).** *Animal Welfare* (Wheathampstead). 2003 Aug; 12(3): 387-402. ISSN: 0962-7286.

NAL call no.: HV4701.A557

Descriptors: vicunas, *Vicugna vicugna*, wool production, animal welfare aspects to wool shearing, harvesting

procedures, distress, stress levels, capture and transport of wild animals, human-wildlife relations, sustainable agriculture, animal physiology, hormone secretion, cortisol, heart rate, breathing, body temperature, blood glucose, creatine kinase, aspartate aminotransferase, habituation, Chile.

Bouts, T.; Fox, M.T.; Scheres, G.; Chavez, A. **Identification of gastrointestinal nematodes and coccidia in wild vicunas (*Lama vicugna*) in Pampa Galeras, Peru.** In: *Erkrankungen der Zootiere: Verhandlungsbericht des 41 Internationalen Symposiums über die Erkrankungen der Zoo und Wildtiere, Rome, Italy, 28 May 1 June, 2003.* 2003: 101-105.

Descriptors: 39 vicunas, wild animals, fecal survey, parasitic nematode eggs, *Bunostomum* (first report), *Capillaria* (first report), coccidian oocysts, *Cooperia*, *Eimeria punoensis*, *Haemonchus*, *Nematodirus*, Strongylidae, *Trichuris*, disease prevalence, epidemiology, gastrointestinal diseases, no age or sex differences, Pampa Galeras, Peru.

Brolin Schlanger, L. **Prevalence of external parasites in alpacas and llamas in Andean Ecuador.** *Minor Field Studies*, International Office, Swedish University of Agricultural Sciences. 2003; (258): 24. ISSN: 1402-3237.

Descriptors: alpacas, llamas, 82 wool producing animals, ectoparasites, ectoparasitoses, examination of wool and skin, skin scrapings, identification at Instituto Agropecuario Superior Andino (IASA), Quito, *Sarcoptes scabiei*, scabies, mites, *Damalinea breviceps*, biting lice, *Microthoracius cameli*, sucking lice, antibody detection with ELISA, prevalence, reduced quality of wool, Ecuador.

Burton, S.; Robinson, T.F.; Roeder, B.L.; Johnston, N.P.; Latorre, E.V.; Reyes, S.B.; SchaaJle, B. **Body condition and blood metabolite characterization of alpaca (*Lama pacos*) three months prepartum and offspring three months postpartum.** *Small Ruminant Research.* 2003; 48(2): 69-76. ISSN: 0921-4488.

NAL call no.: S1.M57

Descriptors: alpacas, crias, females, pre and post partum body conditioning scores, blood chemistry changes in electrolytes, metabolites, pastured animals, *Festuca dolicophylla*, *Poa pretensis*, early spring to late summer, neonate growth patterns, body weight, blood sampling, glucose, plasma urea, creatinine, electrolytes (Na, K, Cl, Ca), non-esterified fatty acid, Kampenaike Research Station in Punta Arenas, Chile.

Bustamante, A.V.; Mate, M.L.; Zambelli, A.; Vidal Rioja, L. **Isolation and characterization of 10 polymorphic dinucleotide microsatellite markers for llama and guanaco.** *Molecular Ecology Notes.* 2003; 3(1): 68-69. ISSN: 1471-8278.

NAL call no.: QH541.15.M632

Descriptors: llamas, guanacos, wild animals, genes, isolation and characterization, genetic polymorphism, alleles, DNA sequencing, genetic markers, genetic polymorphism, heterozygosity, loci, microsatellites, nucleotide sequences, Argentina.

Cebra, C.K.; Tornquist, S.J.; Bildfell, R.J.; Heidel, J.R. **Bile acids in gastric fluids from llamas and alpacas with and without ulcers.** *Journal of Veterinary Internal Medicine.* 2003; 17(4): 567-570.

NAL call no.: SF601.J65

Descriptors: alpacas, llamas, relationship between duodenogastric reflux and ulceration, postmortem, gastric fluid from 1st and 3rd gastric compartments, duodenum, physiopathology, stomach ulcers, bile acids levels, intestinal emptying.

Cebra, Christopher K.; Mattson, Donald E.; Baker, Rocky J.; Sonn, Robert J.; Dearing, Peggy L. **Potential pathogens in feces from unweaned llamas and alpacas with diarrhea.** *Journal of the American Veterinary Medical Association.* 2003; 223(12): 1806-1808. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: llamas, alpacas, crias, 45 unweaned young animals, diarrhea, 39 potential pathogens isolated, *Eimeria* spp., *Giardia* spp., *Cryptosporidium* spp., corona viruses, rotavirus, nematode ova, protozoa, herd management, seasonal differences.

Cecchi, R.; D'Alterio, G.L.; Pearson, G.R.; Foster, A.P. **Retrospective histopathological study of some skin disorders of alpacas (*Lama pacos*).** In: *Erkrankungen der Zootiere: Verhandlungsbericht des 41 Internationalen*

Symposiums uber die Erkrankungen der Zoo und Wildtiere, Rome, Italy, 28-May--1 June, 2003. 2003: 179-183.

Descriptors: alpacas, *Chorioptes* sp., mites, mange, eosinophilic dermatitis, effects on fiber production, skin scrapings, histopathology, hyperkeratosis, lympho-plasmacytic, difficulty in diagnosing skin diseases, United Kingdom.

Clutton, E.; Pascoe, P. **Proceedings of the American College of Veterinary Anesthesiologists 27th Annual Meeting, Orlando, Florida, 10-11 October 2002.** *Veterinary Anaesthesia and Analgesia.* 2003; 30(2): 100-120. ISSN: 1467-2987.

NAL call no.: SF914.V47

Descriptors: llamas, cats, dogs, goats, horses, rabbits, laboratory animals, surgery, acepromazine, adverse effects, anesthesia, anesthetics, analgesics, butorphanol, diazepam, isoflurane, ketamine, thiopental, xylazine, urethane, lidocaine, me detomidine, propofol, pharmacodynamics, pharmacology, drug interactions, compilation of abstracts of 38 research papers.

Cohen, M.; Bohling, M.W.; Wright, J.C.; Welles, E.A.; Spano, J.S. **Evaluation of sensitivity and specificity of cytologic examination: 269 cases (1999-2000).** *Journal of the American Veterinary Medical Association.* 2003; 222(7): 964-967. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: llamas, ferrets, cats, dogs, mice, rats, horses, post mortem diagnosis, diagnostic techniques, cytology, histopathology, hyperplasia, lesions, neoplasms, Alabama, United States.

Compas, L. **Alpacas produce fiber on mid-Missouri farm.** *Small Farm Today.* 2003 Mar/Apr; 20(2): 26-27. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: alpacas, care and husbandry, fiber quality, sustainable agriculture, alternative livestock species, Missouri.

Conrath, K.E.; Wernery, U.; Muyldermans, S.; Nguyen, V.K. **Emergence and evolution of functional heavy-chain antibodies in Camelidae.** *Developmental and Comparative Immunology.* 2003; 27(2): 87-103. ISSN: 0145-305X.

NAL call no.: QR180.D4

Descriptors: llamas, dromedaries, Bactrian camels, review, antibody evolution, heavy chain antibodies, gamma isotypes, antigen binding, immunoglobulins, immunoglobulin, genes encoding ofr HCAb of Camelidae.

Cortes, A.; Miranda, E.; Rau, J.R.; Jimenez, J.E. **Feeding habits of guanacos *Lama guanicoe* in the high Andes of north-central Chile.** *Acta Theriologica.* 2003; 48(2): 229-237. ISSN 0001-7051.

NAL call no.: 410 AC88

Descriptors: guanacos, wild species, 3 age classes, animal behavior, ecology, diets, selective feeding behavior, feeding habits, forage preferences, seasonal variation, dry vs wet years, herbivores, perennial graminoids and legumes, fecal plant remains, wild animals, 4100 meters altitude, Andes, Chile.

D'Alterio, G.L.; Bazeley, K.J.; Pearson, G.R.; Jones, J.R.; Jose, M.; Woodward, M.J. **Meningitis associated with *Salmonella Newport* in a neonatal alpaca (*Lama pacos*) in the United Kingdom.** *Veterinary Record (London).* 2003; 152(2): 56-57. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: new born alpacas, *Salmonella* infection of the meninges, brain disease, clinical aspects, clinical examination, case reports, United Kingdom.

D'Alterio, G.L.; Bazeley, K.J. **Referral service for South American camelids at the University of Bristol Veterinary School: a review of cases between 1999 and 2002.** In: *Erkrankungen der Zootiere: Verhandlungsbericht des 41 Internationalen Symposiums uber die Erkrankungen der Zoo-und Wildtiere, Rome, Italy, 28 May--1 June, 2003.* 2003: 203-210.

Descriptors: South American camelids, llamas, alpacas, guanaco, vicuna, new veterinary residency in camelid medicine, University of Bristol and the Royal College of Veterinary Surgeons Trust, common diagnoses, mandibular/maxillary osteomyelitis, clinical and surgical cases described, Farm Animal Practice and Hospital of the University of Bristol, Britain.

Evdotchenko, D.; Han, Y.; Bartenschlager, H.; Preuss, S.; Geldermann, H. **New polymorphic microsatellite loci for**

different camel species. *Molecular Ecology Notes*. 2003; 3(3): 431-434. ISSN: 1471-8278.

NAL call no.: QH541.15.M632

Descriptors: llamas, alpacas, dromedaries, Bactrian camels, microsatellite loci screened and sequenced, genomic DNA of male Bactrian camel, alleles, genetic markers, genetic variation, genomes, nucleotide sequences.

Fysh, Geoff; Australian Alpaca Association. Education and Training Subcommittee. *Managing Alpacas in Australia: An Introductory Guide to Farming and Breeding Alpacas Under Australian Conditions*. Australian Alpaca Association, Mitchan North, Victoria. c2003. 40 p. ISBN: 0957739036.

NAL call no.: SF401.A4M36 2003

Descriptors: alpaca farming, husbandry, management, care, breeding, educational manual, Australia.

Gauly, M.; Pouillion, C.; Erhardt, G. **Saugverhalten von Lamas (*Lama glama*).** [Suckling behaviour of llamas (*Lama glama*).] *DTW (Deutsche Tierärztliche Wochenschrift)*. 2003; 110(10): 412-416. ISSN: 0341-6593. Note: In German.

NAL call no.: 41.8 D482

Descriptors: 6 llama crias, suckling behavior, position, no side preference, short duration and long duration, age related differences, nutrition and social contact.

Geurden, T.; Deprez, P.; Vercruyssen, J. **Treatment of sarcoptic, psoroptic and chorioptic mange in a Belgian alpaca herd.** *Veterinary Record (London)*. 2003; 153(11): 331-332. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: alpacas, 11 adult females, 2 crias, 1 male, alopecia, pruritus, cachexia, clinical aspects, skin scrapings, skin disease prevalence, ectoparasiticide, epidemiology, *Chorioptes* from ventral abdomen and inner thighs, *Psoroptes* from the head, *Sarcoptes* mites on head and inner thighs, ivermectin treatment was effective, Belgium.

Gonzalez, F.; Paulsen, P.; Smulders, F.J.M.; Skewes, O.; Polsterer Heindl, E.; König, H.E. **Zerlegung: Exotisches für die Fleischtheke: Fachgerechte Zerlegung handelsüblicher Teilstücke von Guanakofleisch.** [Exotics for the meat counter. Specialist cutting of traditional joints of guanaco meat.] *Fleischwirtschaft*. 2003; 83(10): 32-37. ISSN: 0015-363X. Note: In German.

NAL call no.: 280.38 F62

Descriptors: 70 male guanacos, anatomy of meat cuts based on joints, meat structure, meat composition, carcass weight, low animal fat, low cholesterol, crude protein, muscle structure, meat composition, meat cuts, Tierra del Fuego, Chile.

Graziotti, Guillermo Horacio; Rodriguez-Menendez, Jose Manuel; Victorica, Carlos Lisandro; Fux-Solveyra, Gustavo Fabian; Rios, Clara Maria. **Systematic study of the internal iliac artery in llama (*Lama glama*).** *Annals of Anatomy*. 2003; 185(5): 461-463. ISSN: 0940-9602.

Descriptors: llamas, origins of parietal and visceral branches of internal iliac artery, comparison to humans and other animals, similar structure to the cat, Adachi classification is IVa type, comparative anatomy.

Grubb, Tamara L.; Schlipf, John W.; Riebold, Thomas W.; Cebra, Christopher K.; Poland, Lisa; Zawadzka, Xenia; Mailhot, Nicole. **Minimum alveolar concentration of sevoflurane in spontaneously breathing llamas and alpacas.** *Journal of the American Veterinary Medical Association*. 2003; 223(8): 1167-1169. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: llamas, alpacas, healthy adults, anesthesia induction, sevoflurane and oxygen delivered via a mask, endotracheal tube, measurement of endtidal and inspired concentration, procedures and techniques described, MAC of sevoflurane similar to reports for other species.

Hamir, A.N.; Timm, K.I. **Nodular hyperplasia and cysts in thyroid glands of llamas (*Lama glama*) from north-west USA.** *Veterinary Record (London)*. 2003; 152(16): 507-508. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: 77 llamas, thyroids, gross post mortem examination, enlarged, fluid filled cavities, clear yellowish fluid, small multifocal areas of follicular hyperplasia in older animals, Northwest, United States.

Hart, K.W.; Barker, S.J.; Skerritt, J.W.; Vercoe, P.E. **The gene for white fleece in alpacas is homous to AWt, the gene for white fleece in sheep.** In: *50 Years of DNA: Proceedings of the Fifteenth Conference, Association for the Advancement of Animal Breeding and Genetics, Melbourne, Australia, 7-11 July, 2003.* Association for the Advancement of Animal Breeding and Genetics, Armidale, Australia. 2003: 82-85. ISBN: 0958629927.

Descriptors: alpacas, sheep, dominant ovine Agouti allele AWt for white fleece color, segregated Extension locus, recessive allele Ee, phaeomelanin coat, gene expression, genetic model for the inheritance of white fleece, genotype s, inheritance, phenotypes.

Hoffman, Eric. **The Complete Alpaca Book.** 1st ed. Bonny Doon Press, Santa Cruz, Calif. 2003. xxii, 604 p. ill. ISBN: 0972124209.

NAL call no.: SF401.A4H64 2003

Descriptors: alpacas, handling care, diseases, breeding, reproductions, fleece and fiber, raising.

Hoogmoed, L.M. van; Harmon, F.A.; Snyder, J. **Microvascular anatomy of the third compartment of the stomach of llamas.** *American Journal of Veterinary Research.* 2003 Mar; 64(3): 346-350. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: llamas, anatomy, stomach structure, microvascularization of 3rd stomach compartment.

Jenkins, D. **Guard animals for livestock protection: existing and potential use in Australia.** In: *Guard Animals for Livestock Protection: Existing and Potential Use in Australia.* NSW Agriculture; Orange, Australia. 2003: 44. ISBN: 0734715455.

NAL call no.: SF170.J46 2003

Descriptors: sheep, goats, llamas, alpacas, dogs, donkeys, animal husbandry, common breeds of guard dogs, livestock protection, livestock farming losses to predation, pest control, telephone perceptions survey, training of working animals, effectiveness of livestock guarding animals, Australia.

Junkins, K.; Boothe, D. M.; Jensen, J.; Herzog, T.; Chatfield, J. **Disposition of sulfadimethoxine in male llamas (*Lama glama*) after single intravenous and oral administrations.** *Journal of Zoo and Wildlife Medicine.* 2003; 34(1): 9-15. ISSN: 1042-7260.

Descriptors: llamas, healthy, adult, gelded males, disposition of sulfadimethoxine, intravenous dosing followed by oral dosing, blood sampling, serum concentrations, pharmacokinetic study, bioavailability, drug therapy, half-life, pharmacodynamics, minimum inhibitory concentration.

Kiupel, M.; Van Alstine, W.; Chilcoat, C. **Gross and microscopic lesions of polioencephalomalacia in a llama (*Lama glama*).** *Journal of Zoo and Wildlife Medicine.* 2003; 34(3): 309-313. ISSN: 1042-7260.

Descriptors: young female llama, clinical picture, neurologic disease, stiff gait, circling behavior, decreased mentation, seizures, postmortem brain lesions, bilateral necrosis, gray matter, occipital lobes, diagnosis, polioencephalomalacia.

Leroy, J.; Geurden, T.; Meulemans, G.; Moerloose, K.; de Kruif, A. **Ernstige *Sarcoptes scabiei* infectie bij llama's. [Severe *Sarcoptes scabiei* mange in llamas.]** *Vlaams Diergeneeskundig Tijdschrift.* 2003; 72(5): 359-363. ISSN: 0303-9021. Note: In Dutch with an English summary.

Descriptors: llamas, *Sarcoptes scabiei*, mite infections, sarcoptic mange, acaricides, case reports, clinical aspects, pruritus, hyperkeratinization, alopecia and pyoderma, doramectin, multiple drug therapy, topical acaricide made of triacetonolone acetone 1 mg, neomycin sulfate 4.5 mg, nystatin 20.1 mg, lidocaine 20 mg and lindane 5 mg/1 g, Belgium.

Lobo, Maria Luisa; Teles, Ana; Da Cunha, Margarida Barao; Henriques, Joaquim; Lourenco, Ana Mafalda; Antunes, Francisco; Matos, Olga. **Microsporidia detection in stools from pets and animals from the zoo in Portugal: A preliminary study.** *Supplement to the Journal of Eukaryotic Microbiology.* 2003; (50): 581-582. Note: Eighth International Workshops on Opportunistic Protists and International Conference on Anaerobic Protists, Hilo, HI, USA; July 23-29, 2003.

NAL call no.: QL366.J67

Descriptors: captive animals, llama, dogs, birds, rabbits, primates, pigs, feces sampling, epidemiology, populations studies, vector biology, *Encephalitozoon hellum*, *Encephalitozoon intestinalis*, *Enterocytozoon bieneusi*, zoo, Portugal.

Lucas, J.N.; Cousins, D.V.; Mills, A.J.; van Wijk, J.G.A. **Identification of *Mycobacterium avium* subsp. *avium* in an alpaca with lesions resembling paratuberculosis.** *Australian Veterinary Journal*. 2003; 81(9): 567-569. ISSN: 0005-0423.

NAL call no.: 41.8 R3224

Descriptors: alpaca, intestinal lesions, clinical aspects, diagnosis, histopathology, pathogen identification, *Mycobacterium avium avium*, paratuberculosis, case report.

Mannerova, S.; Pantucek, R.; Doskar, J.; Svec, P.; Snauwaert, C.; Vancanneyt, M.; Swings, J.; Sedlacek, I. ***Macrococcus brunensis* sp. nov., *Macrococcus hajekii* sp. nov. and *Macrococcus lamae* sp. nov., from the skin of llamas.** *International Journal of Systematic and Evolutionary Microbiology*. 2003; 53(5): 1647-1654. ISSN: 1466-5026.

Descriptors: llamas, Gram positive, catalase and oxidase positive cocci bacteria, 8 strains, resistance to bacitracin, sensitivity to furazolidone, *Macrococcus*, phylogenetic analysis based on 16SrDNA, new species, ribotyping, macrorestriction analysis, fatty acid methyl ester analysis, 3 stable clusters, proposed names: *Macrococcus hajekii* sp. nov. (type strain CCM 4809T=LMG 21711T), *Macrococcus brunensis* sp. nov. (type strain CCM 4811T=LMG 21712T) and *Macrococcus lamae* sp. nov. (type strain CCM 4815T=LMG 21713T).

Martin, P.A. **Reproductive patterns of alpacas and llamas, with reference to the vicuna and guanaco.** In: Pineda, M.H.; Dooley, M.P. *McDonald's Veterinary Endocrinology and Reproduction*. 5th edition. Iowa State Press, Ames. 2003: 523-546. ISBN: 0813811066.

NAL call no.: SF768.3.M335 2003

Descriptors: alpacas, llamas, vicunas, guanacos, reproductive patterns, anatomy of reproductive organs, sexual maturity, breeding season, fertilization, estrous cycle, ovaries, pregnancy, reproductive efficiency.

Martinson, Elizabeth; Reinhard, Karl J.; Buikstra, Jane E.; de la Cruz, Katharina Dittmar. **Pathoecology of Chiribaya parasitism.** *Memorias do Instituto Oswaldo Cruz*. 2003 15 January; 98: 195-205; (Suppl. 1). ISSN: 0074-0276.

Descriptors: llamas, dogs, guinea pigs, parasitic hosts, pathoecological reconstructions from archaeological remains, Peru.

McKenna, P.B. **Register of new host-parasite records.** *Surveillance Wellington*. 2003; 30(4): 15-16. ISSN: 0112-4927.

Descriptors: alpacas, host parasite relationships, hosts, new host records, Acanthocephala, *Alectoris rufa*, *Anas*, *Ascaridia galli*, *Capillaria*, Hirudinea, *Histomonas meleagridis*, *Larus*, *Macropus*, *Microphallus*, *Moniezia*, *Porrocaecum*, Sturnidae, *Arhythmorhynchus*, *Potamopyrgus*, *Richardsonianus*, *Richardsonianus mauianus*, *Rugopharynx*, *Rugopharynx longispicularis*, New Zealand.

McNeill, Desmond; Lichtenstein, Gabriela. **Local conflicts and international compromises: the sustainable use of vicuna in Argentina.** *Journal of International Wildlife Law and Policy*. 2003; 6(3): 233-253. ISSN: 1388-0292.

Descriptors: vicuna, natural resource management, trade in animals, conflicts over resource use, conservation, sustainable use, Argentina.

Medina, Mirta A.; Fernandez, Francisco; Saad, Silvia; Rebuffi, Gustavo; Von Thuengen, Julieta. **Aspectos comparativos de las proteínas del lactosuero de camelidos Sudamericanos. [Comparative aspects of lactoserum proteins in South American camelids.** *Acta Zoologica Lilloana*. 2003; 47(1-2): 71-76. ISSN: 0065-1729. Note: In Spanish with an English and Spanish summary.

Descriptors: llamas, alpacas, vicunas, guanacos, comparison study, lactoproteins, electrophoretic and Western blot assays, compared with bovines, immunoglobulin G, mammalian IgG, L chain lacking IgG, a four species have serum albumin, alpha-lac talbumin, chain L of immunoglobulins, two different H chain belonging to IgGs, and free secretory component, beta-lactoglobulin was not detected.

Meerburg, B.G.; de Jong, R. **Vicunas in Bolivia: an opportunity for their sustainable use.** *Outlook on Agriculture*. 2003; 32(2): 105-109. ISSN: 0030-7270.

NAL call no.:10 OU8

Descriptors: vicunas, possibilities for change in vicuna production, economic evaluations, economic impact,

sustainability, marketing, production economics, production structure, High Andes, Bolivia.

Messineo, Pablo G. **Analisis arqueofaunisticos en el sitio Laguna La Barrancosa 1 (Partido de Benito Juarez, provincia de Buenos Aires, Argentina).** [Archeological faunistic analysis of the Laguna La Barrancosa 1 site (Benito Juarez district, Buenos Aires province, Argentina).] *Archaeofauna*. 2003; 12: 73-86. ISSN: 1132-6891.

Note: In Spanish.

Descriptors: hunter gather site, late Holocene, bone analyses, exclusively guanaco bones, processing and use of bones, Argentina.

Norambuena, M. Cecilia; Paredes, Marco. **Variabilidad y estructura genetica en dos poblaciones de *Vicugna vicugna* (Camelidae) del norte de Chile.** [Genetic variability and structure in two populations of *Vicugna vicugna* (Camelidae) from northern Chile.] *Revista Chilena de Historia Natural*. 2003 Marzo; 76(1): 99-104. ISSN: 0716-078X. Note: In Spanish with an English summary.

NAL call no.: QH119.R48

Descriptors: vicunas, study of 2 populations, genetic variability, population genetics, allozymic variation, taxonomic implications, Chile.

Nykamp, S.G.; Dykes, N.L.; Cook, V.L.; Beinlich, C.P.; Woodie, J.B. **Computed tomographic appearance of choanal atresia in an alpaca cria.** *Veterinary Radiology and Ultrasound*. 2003; 44(5): 534-5 36. ISSN: 1058-8183.

NAL call no.: SF757.8.A4

Descriptors: alpacas, atresia, clinical aspects, computed tomography, diagnosis, epidemiology, head, respiratory diseases, case reports, New York, United States.

Olivera, L.V.M.; Zago, D.A.; Jones, C.J.P.; Bevilacqua, E. **Developmental changes at the materno-embryonic interface in early pregnancy of the alpaca, *Lama pacos*.** *Anatomy and Embryology*. 2003; 207(4/5): 317-331. ISSN: 0340-2061.

URL: <http://springerlink.metapress.com/app/home/contribution.asp?wasp=2g54>

[nhrtuk3w6xxtwc2l&referrer=parent&backto=issue,7,15;journal,4,78;linkingpublicationresults,id:100395,1](http://springerlink.metapress.com/app/home/contribution.asp?wasp=2g54)

Descriptors: alpacas, pregnancy, trophoblast cell adherence to uterine epithelium, epitheliochorial placentation, luteal and follicular phases, sampling at different ages of pregnancy, description, materno-fetal interactions, attachment areas, hormones.

Olivera, L.; Zago, D.; Leiser, R.; Jones, C.; Bevilacqua, E. **Placentation in the alpaca *Lama pacos*.** *Anatomy and Embryology*. 2003; 207(1): 45-62. ISSN: 0340-2061.

URL: <http://www.springerlink.com/app/home/contribution.asp?wasp=m1b672xvwq4jqg>

[768x2m&referrer=parent&backto=issue,6,9;journal,2,72;linkingpublicationresults,id:100395,1%20](http://www.springerlink.com/app/home/contribution.asp?wasp=m1b672xvwq4jqg) **Descriptors:** alpacas, study of reproduction in females, pregnancy changes in the uterus, trophoblast, chorion, choriomammotropin, endometrium, fetal membranes, histochemistry, morphology, placenta.

Oevermann, A.; Zanolari, P.; Pfyffer, G.E.; Meylan, M.; Robert, N. ***Mycobacterium microti* infection in two llamas (*Lama guanicoe* F. *glama*).** In: *Erkrankungen der Zootiere: Verhandlungsbericht des 41 Internationalen Symposiums über die Erkrankungen der Zoo und Wildtiere, Rome, Italy, 28 May--1 June, 2003*. 2003: 217-220.

Descriptors: llamas, *Mycobacterium microti*, clinical aspects, diagnosis, histopathology, mycobacterial diseases, case reports, Switzerland.

Parraguez, V.H.; Thenot, M.; Latorre, E.; Ferrando, G.; Raggi, L. A. **Milk composition in alpaca (*Lama pacos*): Comparative study in two regions of Chile.** *Archivos de Zootecnia*. 2003; 52(200): 431-439. ISSN: 0004-0592.

NAL call no.: 49 AR22

Descriptors: alpacas, colostrum and milk composition, 5 months of lactation, effects of environmental conditions, pasture quality, altitude, 4400 meters in the Andean high plateau, Patagonian at 12 meters, comparison study, dry matter, protein, fat, lactose, ash content, variations in fat and lactose levels, differences may be pasture and behavior related.

Pinares Patino, C.S.; Ulyatt, M.J.; Waghorn, G.C.; Lassey, K.R.; Barry, T.N.; Holmes, C.W.; Johnson, D.E. **Methane emission by alpaca and sheep fed on lucerne hay or grazed on pastures of perennial ryegrass/white clover or**

birdsfoot trefoil. *Journal of Agricultural Science.* 2003 Mar; 140(pt. 2): 215-226. ISSN: 0021-8596.

NAL call no.: 10 J822

Descriptors: alpacas, Romney sheep, feeding, chaff, alfalfa, hay, grazing, *Lolium perenne*, *Lotus corniculatus*, *Trifolium repens*, forage evaluation, chemical constituents of plants, organic matter, digestibility, rumen fermentation, methane gas emission levels, quantitative analysis, comparison study, New Zealand.

Abstract: Based on the knowledge that alpaca (*Lama pacos*) have a lower fractional outflow rate of feed particles (particulate FOR) from their forestomach than sheep (San Martin 1987), the current study measured methane (CH₄) production and other digestion parameters in these species in three successive experiments (1, 2 and 3): Experiment 1, lucerne hay fed indoors; Experiment 2, grazed on perennial ryegrass/white clover pasture (PRG/WC); and Experiment 3, grazed on birdsfoot trefoil (*Lotus corniculatus*) pasture (*Lotus*). Six male alpaca and six castrated Romney sheep were simultaneously and successively fed on the forages either ad libitum or at generous herbage allowances (grazing). CH₄ production (g/day) (using the sulphur hexafluoride tracer technique), voluntary feed intake (VFI), diet quality, and protozoa counts and volatile fatty acid concentrations in samples of forestomach contents were determined. In addition, feed digestibility, energy and nitrogen (N) balances and microbial N supply from the forestomach (using purine derivatives excretion) were measured in Experiment 1. Diets selected by alpaca were of lower quality than those selected by sheep, and the voluntary gross energy intakes (GEI, MJ) per kg of liveweight(0.75) were consistently lower ($P < 0.001$) for the alpaca than for the sheep (0.74 v. 1.36, 0.61 v. 1.32 and 0.77 v. 2.53 on lucerne hay, PRG/WC and Lotus, respectively). Alpaca and sheep did not differ ($P > 0.05$) in their CH₄ yields (% GEI) when fed on lucerne hay (5.1 v. 4.7), but alpaca had a higher CH₄ yield when fed on PRG/WC (9.4 v. 7.5, $P < 0.05$) and Lotus (6.4 v. 2.7, $P < 0.001$). When grazing on Lotus, the sheep had very high protozoa counts in their forestomach contents, compared with those with the other forages and those in the alpaca. On lucerne hay and Lotus, but not on PRG/WC, the alpaca had higher ($P < 0.01$) acetate/propionate ratio in their forestomach fluid than sheep. When fed on lucerne hay, alpaca and sheep did not differ ($P > 0.05$) in diet N partition or microbial N yield, but alpaca had higher ($P < 0.05$) neutral detergent fibre digestibility (0.478 v. 0.461) and lower ($P < 0.01$) urinary energy losses (5.2 v. 5.8 % GEI) than sheep. It is suggested that differences between these species in forestomach particulate FOR might have been the underlying physiological mechanism responsible for the differences in CH₄ yield, although the between-species differences in VFI and diet quality also had a major effect on it.

Pineda, M.H.; Dooley, M.P. *Veterinary Endocrinology and Reproduction.* 5th edition. Iowa State Press, Ames. 2003; xiv + 597 pp. ISBN: 0813811066.

NAL call no.: SF768.3.M335 2003

Descriptors: alpacas, llamas, cats, dogs, cattle, goats, horses, pigs, sheep, adrenal glands, reproduction, endocrinology, thyroid glands, pancreas, pituitary, artificial insemination, calcitonin, cholecalciferol, embryo transfer, parathyrin, reproduction.

Ratto, M.H.; Singh, J.; Huanca, W.; Adams, G.P. **Ovarian follicular wave synchronization and pregnancy rate after fixed-time natural mating in llamas.** *Theriogenology.* 2003; 60(9): 1645-1656. ISSN: 0093-691X.

NAL call no.: QP251.A5

Descriptors: llamas, reproduction physiology, induction of follicular wave synchronization, pregnancy rates, fixed time natural mating, estradiol and progesterone (E/P, n=20); (3) LH (LH, n=20); or (4) transvaginal ultrasound-guided follicle ablation (FA, n=20), daily monitoring with transrectal ultrasonography, LH and FA most effective, increased pregnancy in synchronized females.

Reynolds, B.J. **Turning problems into profits.** *Rural Cooperatives.* 2003 Mar/Apr; 70(2): 8-10. ISSN: 1088-8845.

URL: <http://purl.access.gpo.gov/GPO/LPS5331>

NAL call no.: aHD1491.U6R87

Descriptors: cooperatives, alpacas, fibers, textile industry, United States.

Sarno, Ronald J.; Bank, Michael S.; Stern, Hal S.; Franklin, William L. **Forced dispersal of juvenile guanacos (*Lama guanicoe*): Causes, variation, and fates of individuals dispersing at different times.** *Behavioral Ecology and Sociobiology.* 2003 Jun; 54(1): 22-29. ISSN: 0340-5443.

Descriptors: guanacos, impacts of forced dispersal, behavior, activity patterns, population dynamics, dispersal patterns in habitat, Torres del Paine National Park, Chile.

Schulman, F.Y.; Krafft, A.E.; Janczewski, T.; Reupert, R.; Jackson, K.; Garner, M.M. **Camelid mucocutaneous fibropapillomas: clinicopathologic findings and association with papillomavirus.** *Veterinary Pathology.* 2003; 40(1): 103-107. ISSN: 0300-9858.

NAL call no.: 41.8 P27

Descriptors: alpacas, llamas, fibropapillomas, similar to equine sarcoids, ulcerated hyperplastic epidermis with thin rete pegs, lesions on nose, lip and cheek, papillomavirus by PCR, one was a unique PV, clinical aspects, histopathological lesions, nucleotide sequences.

Shi, Yan Feng; Shan, Xiang Nian; Li, Jian; Zhang, Hai Jun; Zheng, Ai Ling. **[Phylogenetic relationships of seven *Cetartiodactyla* species inferred from mitochondrial genome.]** *Zoological Research.* 2003; 24(5): 331-336. ISSN: 0254-5853. Note: In Chinese.

Descriptors: mitochondrial genomes, muntjak, based on concatenated sequences of 13 inferred amino acid sequences of protein coding genes, phylogenetic tree, 3 clades, muntjak-sheep, cow clade, pig alpaca clade, hippopotamus-whale clade, divergence millions of years ago.

Sponheimer, M.; Robinson, T.; Ayliffe, L.; Passey, B.; Roeder, B.; Shipley, L.; Lopez, E.; Cerling, T.; Dearing, D.; Ehleringer, J. **An experimental study of carbon-isotope fractionation between diet, hair, and feces of mammalian herbivores.** *Canadian Journal of Zoology.* May 2003; 81(5): 871-876. ISSN: 0008-4301. Note: In English with a French summary.

NAL call no.: 470 C16D

Descriptors: cattle, llamas, alpacas, goats, rabbits, horses, herbivores, diet, feeds, alfalfa, *Medicago sativa*, *Cynodon dactylon*, *Bromus inermis*, carbon, stable isotopes, isotope fractionation, hairs, feces, chemical composition, diet switch, carbon turnover.

Sponheimer, M.; Robinson, T.F.; Roeder, B.L.; Passey, B.H.; Ayliffe, L.K.; Cerling, T.E.; Dearing, M.D.; Ehleringer, J.R. **An experimental study of nitrogen flux in llamas: Is ^{14}N preferentially excreted?** *Journal of Archaeological Science.* 2003; 30(12): 1649-1655. ISSN: 0305-4403.

Descriptors: llamas, nitrogen isotopes, ^{15}N enrichment as move up the food chain, differential excretion for ^{14}N , diet study, high and low protein, fecal and urinary nitrogen loss, theorize influx and efflux in adult animals is steady state, possibly under growth, diet change, nutritional stress, heat stress, may change steady state.

Sponheimer, M.; Robinson, T.; Roeder, B.; Hammer, J.; Ayliffe, L.; Passey, B.; Cerling, T.; Dearing, D.; Ehleringer, J. **Digestion and passage rates of grass hays by llamas, alpacas, goats, rabbits, and horses.** *Small Ruminant Research.* 2003; 48(2): 149-154. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: alpacas, llamas, goats, horses, rabbits, digestive efficiency, pecoran ruminants and South American camelids comparison, digestibility, C_3 *Bromus inermis*, C_4 *Cynodon dactylon*, grass hay, foregut fermenters and hindgut fermenters, nitrogen metabolism, nutrition, nutritive value, pasture plants, photosynthesis, species differences.

Staudte, K.L.; Gibson, N.R. **Type 1B external fixation of a metacarpal fracture in an alpaca.** *Australian Veterinary Journal.* 2003; 81(5): 265-267. ISSN: 0005-0423.

NAL call no.: 41.8 AU72

Descriptors: alpacas, external skeletal fixation, 1B frame, comminuted metacarpal bone fractures, first treated with internal fixation, normal recovery with complete healing, case reports, Australia.

Step, D.L.; Ritchey, J.W.; Drost, W.T.; Bahr, R.J. **Ameloblastic odontoma in the mandible of a llama.** *Canadian Veterinary Journal.* 2003; 44(10): 824-827. ISSN: 0008-5286. Note: In English with a French summary.

NAL call no.: 41.8 R3224

Descriptors: 4 year old llama, clinical picture, aggressive, multiloculated, expansile bone lesion, rostral mandible, diagnosis, radiography, computed tomography, ameloblastic odontoma, tooth diseases, Oklahoma, United States.

Tharaldsen, J.; Djonne, B.; Fredriksen, B.; Nyberg, O.; Sigurdardottir, O. **The national paratuberculosis program in Norway.** *Acta Veterinaria Scandinavica.* 2003; 44(3/4): 243-246. ISSN: 0044-605X.

NAL call no.: 41.8 AC87

Descriptors: cattle, goats, llamas, Johne's disease, paratuberculosis, disease control programs, diagnosis, disease prevalence, disease surveys, epidemiology, immunodiagnosis, seroprevalence, *Mycobacterium avium* subsp. *paratuberculosis*, Norway.

Vaughan, J.L.; Macmillan, K.L.; Anderson, G.A.; D'Occhio, M.J. **Effects of mating behaviour and the ovarian follicular state of female alpacas on conception.** *Australian Veterinary Journal*. 2003; 81(1/2): 86-90. ISSN: 0005-0423.

NAL call no.: 41.8 AU72

Descriptors: alpacas, mating behavior effects on ovarian follicles, success of conception, corpus luteum, pregnancy, commercial stud, Victoria, receptive and nonreceptive behaviors, transdominal ultrasound scanning, plasma concentration of estradiol and progesterone, Australia.

Villarreal, F.; Longo, L. **Valoracion economica del guanaco patagonico. [A methodological approach for the economic valuation of an alive natural resource.]** *Revista de la Facultad de Agronomia Universidad de Buenos Aires*. 2003; 23(1): 59-69. ISSN: 0325-9250. Note: In Spanish with an English summary.

Descriptors: guanaco, sheep, production animals, contingent valuation, cost benefit analysis of 3 systems, traditional sheep production, sustainable sheep production, extensive guanaco production, rangeland farming systems, negative impact of desertification on sheep, methodology, reduced sustainability of sheep farming, value of guanacos, conservation of forage resources, Patagonia, Argentina.

Waldrige, B.M.; Billups, L.H.; Frost, A.R.; McKenzie, D.M.; Lenz, S.D. **A hormone receptor positive mammary gland adenocarcinoma in a llama.** *Journal of Applied Research in Veterinary Medicine*. 2003; 1(2): 163-167. ISSN: 1542-2666.

Descriptors: adult female llama, ovariectomized, udder enlargement, mammary gland adenocarcinoma, estrogen hormone receptors, immunohistochemistry, neoplasms, physiopathology, progesterone.

Wentz, P.A.; Belknap, E.B.; Brock, K.V.; Collins, J.K.; Pugh, D.G. **Evaluation of bovine viral diarrhea virus in New World camelids.** *Journal of the American Veterinary Medical Association*. 2003; 223(2): 223-228. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: llamas, alpacas, experimental infection of females with bovine diarrhea virus, no effects on crias or fetus, antibodies after colostrums consumption, antibodies, effect on fetuses, seroprevalence, genetic characterization of BVDV isolates from llamas, reverse transcription polymerase chain reaction assay, specific antibody responses, few clinical signs, infection source probably cattle.

Wheeler, J.C.; Fernandez, M.; Rosadio, R.; Hoces, D.; Kadwell, M.; Buford, M.W. **Genetic diversity and management implications for vicuna populations in Peru.** In: John Lemons; Reginald Victor; Daniel Schaffer (Editors). *Conserving Biodiversity in Arid Regions: Best Practices in Developing Nations*. Kluwer Academic, Boston, Dordrecht & London. 2003: 327-344. ISBN: 1402074832.

Descriptors: vicuna populations, genetic diversity of populations, animal resource management, conservation measures and genetic diversity, molecular genetics, Peru.

Yau, K.Y.F.; Groves, M.A.T.; Li, Sheng Hua; Sheedy, C.; Lee, Hung; Tanha, J.; MacKenzie, C.R.; Jermutus, L.; Hall, J.C. **Selection of hapten-specific single-domain antibodies from a non-immunized llama ribosome display library.** *Journal of Immunological Methods*. 2003; 281(1/2): 161-175. ISSN: 0022-1759.

Descriptors: llamas, lymphocytes, VHH of heavy chain antibodies, complementary DNA, DNA libraries, haptens, lymphocytes, messenger RNA, peptides, ribosomes, selection.

Zanolari, P.; Zulauf, M.; Nitzl, D.; Ueltschi, G.; Steiner, A. **Offene Schragfraktur von Metatarsus III/IV und interne Fixation bei einem Alpaka. [Open fracture of metatarsus III/IV treated by open reduction and internal fixation in an alpaca.]** *SAT, Schweizer Archiv fur Tierheilkunde*. 2003; 145(8): 378-385. ISSN: 0036-7281. Note: In German with summaries in English, French and Italian.

Descriptors: 15 month old male alpaca, bone fracture of metatarsus, fracture fixation, surgical procedure, meticulous lavage and curettage, fracture reduction, internal fixation with 12 hole broad 3.5 mmDCP, implantation of gentamicin

impregnated collagen sponge, healing was good, implant later removed, case report, Czechoslovakia.

Zapata, B.; Fuentes, V.; Bonacic, C.; Gonzalez, B.; Villouta, G.; Bas, F. **Haematological and clinical biochemistry findings in captive juvenile guanacos (*Lama guanicoe* Muller 1776) in central Chile.** *Small Ruminant Research*. 2003; 48(1): 15-21. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: male and female guanacos, farmed animals, hematological values, blood biochemistry, plasma, hematocrit, blood protein, serum albumin, blood sugar, creatine kinase, enzyme activity, hematology, hemoglobin, blood cells, lymphocytes, neutrophils, seasonal variation, sex differences, wild animals, Chile.

2002

Aller, J.F.; Rebuffi, G.E.; Cancino, A.K.; Alberio, R.H. **Successful transfer of vitrified llama (*Lama glama*) embryos.** *Animal Reproduction Science*. Sep 16, 2002; 73(1/2): 121-127. ISSN: 0378-4320.

NAL call no.: QP251.A5

Descriptors: llamas, embryos, embryo culture, embryo transfer, sexual reproduction, embryo survival, cryopreservation, chorionic gonadotropin, GnRH, estradiol, ovulation, blastocysts, glycerol, ethylene glycol, sucrose, synchronized females, pregnancy rate, reproductive techniques.

Aller, J.F.; Rebuffi, G.E.; Cancino, A.K. **Superovulation response to progestogen treatment in vicuna (*Vicugna vicugna*) in semicaptive conditions.** *Theriogenology*. January 2, 2002; 57(1): 576. ISSN: 0093-691X. Note: Proceedings of the Annual Conference of the International Embryo Transfer Society, Foz do Iguassu, Parana, Brazil, January 12-15, 2001.

NAL call no.: QP251.A1T5

Descriptors: vicuna, semicaptive females, hormone treatment, progestogen-eCG, reproduction hormones.

Aller, J.F.; Cancino, A.K.; Rebuffi, G.E.; Alberio, R.H. **Transferencia de embriones vitrificados de llama (*Lama glama*) en el altiplano Argentino. [Transfer of vitrified embryos of the llama (*Lama glama*) on the altiplano of Argentina.]** *Veterinaria Argentina*. 2002; 19(185): 363-386. ISSN: 0326-4629. Note: In Spanish.

NAL call no.: 41.8 G112

Descriptors: llamas, 12 superovulated domestic animals, embryo preservation, cryopreservation, embryo transfer, vitrification techniques are simple, rapid and low cost, Argentina.

Andrew, Stacy E.; Willi, A. Michelle; Anderson, David. **Density of corneal endothelial cells, corneal thickness, and corneal diameters in normal eyes of llamas and alpacas.** *American Journal of Veterinary Research*. March, 2002; 63(3): 326-329. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, alpacas, eye measurements, non-contact, specular microscopy, thickness, ultrasonographic pachymetry, Jameson calipers, vertical and horizontal corneal diameters, sex differences, adult and young animals.

Aylan-Parker, J.; McGregor, B.A. **Optimising sampling techniques and estimating sampling variance of fleece quality attributes in alpacas.** *Small Ruminant Research*. April, 2002; 44(1): 53-64. ISSN: 0921-4488

NAL call no.: SF380.I52

Descriptors: Huacaya and Suri alpacas, males, females, fleece, models to predict fleece quality, sampling fleece from various body parts, Australia.

Abstract: Huacaya and Suri alpacas (n = 120) of varying age, live weight (LWT) and sex (female, male) were selected randomly from four farms in southern Australia. At shearing, fleeces were divided into four components: saddle (S), neck (N), pieces (P; front and back legs, belly, apron) and the midside sample (MS). Components were weighed, sampled using the grid sampling technique and fleece attributes measured: clean washing yield (CWY), mean fibre diameter (MFD), coefficient of variation of the MFD (CV(D)), incidence of medullated fibres (Med), mean medullated fibre diameter (MedMFD) and coefficient of variation of the MedMFD (MedCV(D)). The MS and saddle grid sample (SGS) were used to create models to predict the fleece attribute of the total fleece (TF), saddle and neck fibre. For each fleece attribute MS had lower values than SGS and TF (P < 0.005) and SGS, except for CWY, had lower values than the P and TF (P < 0.005). The means were: MFD MS 27.5 micrometer, S 28.8 micrometer, N 28.7 micrometer, P 37.6

micrometer, TF 31.2 micrometer; CV(D) MS 24.3%, S 27.0%, N 28.6%, P 30.6%, TF 28.1%; CWY MS 90.2%, S 91.4%, N 88.9%, P 92.8%; Med 24.4%, S 33.1%, P 44.5%, TF 35.2%; MedMFD MS 32.7 micrometer, S 34.4 micrometer, P 41.1 micrometer, TF 36.0 micrometer; MedCV(D) MS 19.4%, S 22.3%, P 25.9%, TF 23.4%. The MS was found to be an appropriate sample from which to predict the MFD and CWY CV(D) was only satisfactorily predicted by the SGS ($r = 0.88$), with the exception of the neck fleece, for which neither the MS nor SGS could provide an accurate predictive model. The MS did not sufficiently account for the variation in Med ($r = 0.73-0.79$). The SGS gave accurate prediction of Med ($r = 0.98$). Sex effects were detected in models for TFMFD, NMFD and TFCV(D). LWT effects were detected in models for NMFD, NCV(D) and TFMedMFD. SGS often gave a more accurate prediction of a fleece attribute but it requires the removal of the entire fleece, whereas MS can be removed by shearing a small area or can be removed during shearing with a minimum of effort. Sampling variance for SGS was generally two to four times greater than the sampling variance for MS with the 95% confidence limits (CLs) for SGS being about double those of MS for most parameters except for clean washing yield (CWY) which were similar. Sampling variance for the incidence of medullated fibres in SGS was very high. The large 95% CL for all the tested fibre attributes indicate that alpaca breeders and advisors need to consider taking suitable duplicate measurements and other precautions during breeding and animal selling programs.

Bank, Michael S.; Sarno, Ronald J.; Campbell, Nichole K.; Franklin, William L. **Predation of guanacos (*Lama guanicoe*) by southernmost mountain lions (*Puma concolor*) during a historically severe winter in Torres del Paine National Park, Chile.** *Journal of Zoology* (London). 2002 October; 258(2): 215-222. ISSN: 0952-8369.

Descriptors: guanacos, mountain lions, *Puma concolor*, prey/predator relationships, impact of severe winter conditions, Torres del Paine National Park, Chile.

Bedenice, D.; Mazan, M.R.; Kuehn, H.; Hoffman, A.M. **Diaphragmatic paralysis due to phrenic nerve degeneration in a llama.** *Journal of Veterinary Internal Medicine*. 2002 Sep/Oct; 16(5): 603-606. ISSN: 0891-6640.

NAL call no.: SF601.J65

Descriptors: llamas, phrenic nerve degeneration, diaphragm paralysis, nerve atrophy, clinical aspects, respiration rate, lung ventilation disfunction, diagnostic techniques, diagnostic value, respiratory inductive plethysmography, pneumotachography, diagnostic value.

Bildfell, Robert J.; Long, Patrick; Sonn, Robert. **Cryptococcosis in a llama (*Lama glama*).** *Journal of Veterinary Diagnostic Investigation*. 2002 Jul; 14(4): 337-339. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llama, male, case study, pathogenesis, *Cryptococcosis*, tissues affected.

Abstract: *Cryptococcosis* was diagnosed in a 17-year-old male llama that had been euthanatized following an acute onset of neurologic disease. Tissues affected included the brain, spinal cord, lung, and kidney. The character of the leukocytic response varied from minimal to pyogranulomatous. *Cryptococcosis* has not been previously reported in a llama, although the infection has been described in 2 other species of New World camelids. The pathogenesis of *Cryptococcosis* is briefly reviewed.

Bravo, P.W.; Moscoso, R.; Alarcon, V.; Ordonez, C. **Ejaculatory process and related semen characteristics.** *Archives of Andrology*. 2002 Jan-Feb; 48(1): 65-72. ISSN: 0148-5016.

NAL call no.: QP253.A54

Descriptors: llamas, alpacas, urethral contractions, semen characteristics, transrectal probe technique, artificial vagina, spermatic motility and concentration.

Abstract: South American camelids are dribble ejaculators, and urethral contractions occur throughout copulation, which may last 25 min. The urethral contractions and their association with semen characteristics during copulation were determined in llamas and alpacas. A transrectal probe was held in the rectum of the male while copulating an artificial vagina, which was accessed underneath the dummy through a hole. The semen collecting tube was changed every 5 min. Semen characteristics, color, volume, consistency, motility, concentration, and percentage of live sperm were determined at 5 min intervals. Urethral contractions were evenly distributed during copulation: 40 in alpacas and 63 in llamas ($p < .05$), with a general range of 11 to 132. Semen color was milky in 63%, and translucent in 36.5% for alpacas; and creamy (9.9%) milky (47%), and translucent (42%) for llamas. The mean volume of ejaculate was 0.3, 0.4, 0.6, 0.7, 0.6, 0.8, 0.3, and 3.0 mL for 5, 10, 15, 20, 25, and 30 min, respectively. Semen consistency was variable: viscous (65%) and semiviscous (34%) in alpacas; and viscous (57%) and semiviscous (42%) in llamas. Spermatic

motility varied between 60 and 80% for the llama, and 40 and 80% for the alpaca. Spermatic concentration varied between 60 and 188 x 10(3)/mm³ in llamas, and 30 and 170 x 10(3)/mm³ in alpacas. Percentage of live sperm varied the least: 81 to 90% in llamas and 65 to 90% in alpacas. The ejaculate of llamas and alpacas is not fractionated, urethral contractions are evenly distributed, during copulation, and semen characteristics are present throughout the copulatory period.

Buendia, P.; Soler, C.; Paolicchi, F.; Gago, G.; Urquieta, B.; Perez Sanchez, F.; Bustos Obregon, E. **Morphometric characterization and classification of alpaca sperm heads using the sperm-class analyzer computer-assisted system.** *Theriogenology*. 2002 Mar 1; 57(4): 1207-1218. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: alpacas, sperm morphology, sperm fertility, standarised morphological criteria, sperm quality, Sperm Class Analyzer computer-aided image analysis system, sperm head size and shape.

Abstract: Sperm morphology has been identified as one characteristic which can be useful in the prediction of sperm fertility, therefore, we hope that this study aimed at establishing standardized morphological criteria might serve in future studies dealing with the search for sperm parameters which facilitate an estimation of sperm quality. For this purpose, ejaculates from fertile alpacas were used to evaluate sperm head morphometry by means of the Sperm-Class Analyzer (SCA) computer-aided image analysis system. We defined three morphological categories according to sperm head size (normal 50%, small 26%, large 24%) and five categories according to sperm head shape (normal 47%, pyriform 3%, short 20%, round 1%, long 29%). Sperm classification according to shape was performed by first morphometrically characterizing sperm heads clearly falling into each of the shape categories. Thereafter, discriminant analysis was performed on the data from these typical sperm heads and the resulting classification functions were used to categorize 2,200 spermatozoa from 11 alpacas. Classification of sperm heads by this method agreed in 88% of the cases with most of the misclassifications being due to pyriform heads classified as long heads. Morphometric values obtained from samples of 50, 100, 150, 175 and 200 sperm heads were compared. At least 150 sperm heads should be evaluated to overcome sample size influence on sperm measurements. Significant differences in sperm morphometry were found between individuals (CV for morphometric parameters ranging from 1.3 to 13.0) and there were marked differences in the sperm morphological composition of the ejaculates. Within-animal CV ranged from 4.7 to 17.8 thus showing the high degree of sperm polymorphism present in the alpaca ejaculate.

Bustamante, A.V.; Zambelli, A.; De Lamo, D.A.; von Thungen, J.; Vidal, Rioja L. **Genetic variability of guanaco and llama populations in Argentina.** *Small Ruminant Research*. May, 2002; 44(2): 97-101. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: llama, guanacos, dinucleotide microsatellite loci markers, population parameters, allele size and distribution, heterozygosity, Hardy-Weinberg equilibrium, genetic distances, polyorphic information content. exclusion probability, high level of genetic variability, genetic stocks, conservation, sustainable use programs.

Butler, K.L.; McGregor, B.A. **A statistical approach for evaluating micron blowout, with Australian alpacas as an example.** *Wool Technology and Sheep Breeding*. 2002; 50(3): 383-389. ISSN: 0043-7875.

Descriptors: alpacas, sheep, Australian Merino, wool producing animals, age, animal fibers heritability, statistical analysis, Australia.

Cebra, C.K.; Watrous, B.J.; Cebra, M.L. **Transabdominal ultrasonographic appearance of the gastrointestinal viscera of healthy llamas and alpacas.** *Veterinary Radiology and Ultrasound*. 2002 Jul/Aug; 43(4): 359-366. ISSN: 1058-8183.

NAL call no.: SF757.8.A4

Descriptors: llamas, alpacas, ultrasonography, gastrointestinal diseases, abdomen, stomach motility, intestinal motility, small intestine, large intestine, colon, peritoneum, peritoneal fluids, normal values, diagnostic value, intestinal obstructio n.

Chaves, M.G.; Aba, M.; Agüero, A.; Egey, J.; Berestin, V.; Rutter, B. **Ovarian follicular wave pattern and the effect of exogenous progesterone on follicular activity in non-mated llamas.** *Animal Reproduction Science*. 2002 Jan 23; 69(1-2): 37-46 ISSN: 0378-4320.

NAL call no.: QP251.A5

Descriptors: secretory profiles of oestradiol-17beta, progesterone, follicular dynamics, non- ovulating animals,

exogenous progesterone effects, hormone production, adults, non-pregnant, transrectal ultrasonography.

Abstract: The aim of the present study was two-fold. First, to characterize the secretory profiles of oestradiol-17 β and progesterone in relation to the structural changes observed by ultrasonography during follicular dynamics in non-ovulating llamas. Second, to evaluate the effect of exogenous progesterone on follicular activity, in terms of follicle development and hormone production. In experiment one, six adult non-pregnant, non-lactating llamas were examined daily by rectal palpation and transrectal ultrasonography during 70 days. On day 54, intravaginal devices containing 0.33 g of progesterone (CIDR) were inserted and left in the vagina during 16 days. The mean duration of a follicular wave was 22.6 \pm 2.5 days. The follicular growth phase (follicles growing from 3mm to maximum size) averaged 9.2 \pm 2.8 days, the mature phase (follicles around maximum size) 5.2 \pm 1.4 days and regression phase (follicles with decreasing size) 8.2 \pm 2.2 days. Oestradiol-17 β plasma concentrations exhibited a similar wave pattern ($P < 0.05$). In addition, oestradiol-17 β peak plasma concentrations (46.9 \pm 3.3 pmol(-1)) were attained approximately 12 days after the beginning of the growing phase in connection with maximum follicle size (11.8 \pm 1.6mm). After CIDR insertion, a rapid increase in plasma progesterone concentrations was observed, with peak concentrations attained on day 1 after insertion. Thereafter, concentrations decreased gradually. Mean follicle size steadily decreased from the day of CIDR insertion to day 11 post-insertion (10.3 \pm 1.6 and 3.3 \pm 0.8mm, respectively). In order to investigate the effect of follicle size at CIDR insertion on the outcome of progesterone treatment, experiment two was designed. Sixteen adult non-pregnant and non-lactating llamas were divided into four groups according to follicle development at the time of CIDR insertion (group I: follicles $<$ or $=$ 6 mm; group II: follicles between 6 and 9 mm; group III: follicles between 10 and 14 mm and group IV, regressing follicles). In groups II, III and IV, a significant decrease in follicle size was observed after the insertion of the CIDR device. In group I, no further development of dominant follicles was observed until the device was withdrawn. In all cases, the smallest diameter was registered between days 5 and 7 after the beginning of treatment. In conclusion, a detailed characterization of follicular waves using ultrasound and hormone determinations simultaneously in non-ovulating llamas and after the insertion of progesterone releasing devices, is presented.

Chen, Zhigang; Narang, Saran; Ni, Feng. **Solution structure of a llama single-domain antibody with hydrophobic residues typical of the VH/VL interface.** *Biochemistry*. 2002 Jul 9; 41(27): 8570-8579. ISSN: 0006-2960.

NAL call no.: 381 B523

Descriptors: llama, antibody, BrucD4-4, NMR spectroscopy, VH, V(H)H, differentiating from murine and human VHs, molecular structure, surface characteristics, hydrophobicity.

Davis, C. **Alpacas as a retirement career.** *Small Farm Today*. 2002 Mar/Apr; 19(2): 39-40. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: alpacas, llamas, retirement income, fleece, conformation, breeding, care and management, llamas, United States.

Del Campo, M.R.; Toro, F.; von Baer, A.; Montecinos, S.; Donoso, X.; von Baer, L. **Morphology and physiology of llama (*Lama glama*) and alpaca (*Lama Paco*) embryos.** *Theriogenology*. January 2, 2002; 57(1): 581. ISSN: 0093-691X. Note: Proceedings of the Annual Conference of the International Embryo Transfer Society, Foz do Iguassu, Parana, Brazil, January 12-15, 2001.

NAL call no.: QP251.A1T5

Descriptors: llamas, alpacas, embryos, structure, morphology, biochemical physiology.

DuBois, W.R. **Injectable anesthesia in llamas and alpacas.** *Proceedings of the North American Veterinary Conference*. 2002; 16: 166-168. Note: In volume: *Large Animal*. Part of a three volume set. Meeting held January 12-16, 2002, Orlando, Florida.

NAL call no.: SF605.N672

Descriptors: llamas, alpacas, injectable anesthetics.

European College of Veterinary Surgeons. **Eleventh Annual Scientific Meeting of the European College of Veterinary Surgeons, Vienna, Austria, July 5-7, 2002.** *Veterinary Surgery*. May-June, 2002; 31(3): 285-302. ISSN: 0161-3499. Note: Includes abstracts of papers (55) and posters (25) on clinical studies and surgical topics. Animals include llamas, dogs, cats and horses.

NAL call no.: SF911.V43

Descriptors: veterinary surgical methods, clinical studies, various mammals, dogs, cats, llamas, horses.

Farrar, L.H. **Ready. Get set. Show! (Showing alpacas).** *Small Farm Today*. 2002 Mar/Apr; 19(2): 43-44. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: alpacas, competitive shows, conformation, preparing the animals, fleece and fibers quality.

Flores, P.; Garcia Huidobro, J.; Munoz, C.; Bustos Obregon, E.; Urquieta, B. **Alpaca semen characteristics previous to a mating period.** *Animal Reproduction Science*. 2002 Aug 15; 72(3-4): 259-266. ISSN: 0378-4320.

NAL call no.: QP251.A5

Descriptors: alpacas, males, fertility, sperm quality, artificial vagina, sperm color, volume, volume, morphology, protocol for selecting good breeding males.

Abstract: Increasing the knowledge of the semen characteristics in the alpaca will contribute to understanding one of the many factors that affect the poor fertility rate in this species. Ten adult male alpacas, 2.6-10 years of age, average weight 64.7+/-4.7kg were used. The animals were distributed randomly into two groups of five each and submitted alternatively to two semen collections, using an artificial vagina and sexually receptive females. For the first semen collection the animals had a sexual rest period of about 90 and 45 days before the second. Duration of semen collection, color and volume of ejaculate were recorded, and sperm concentration and morphology (light microscopy) were evaluated. Descriptive statistical analyses were used for each variable, considering all samples obtained (n=19). An analysis of variance for animal groups and opportunity of collection were used for quantitative variables. Most frequent color was opalescent white (84.2%). There were no statistical differences among male groups or between semen collections. The average values and standard deviations for the quantitative variables were: 12.3+/-7.2min for semen collection time, 1.8+/-0.8ml for ejaculate volume, $(17.6+/-26.1) \times 10^6$ sperm/ml for sperm concentration and $34.0+/-52.2 \times 10^6$ for total number of sperm per ejaculate. The percentage of normal spermatozoa was 51.0+/-12.4%. From the total abnormalities, that of mid piece segment (14.4%) was the most frequent. These results indicate that male alpaca have poor semen quality, when compared with other domestic species. Nevertheless, for the evaluation of male alpaca as breeders it would be necessary to create a protocol for the selection of them, where phenotypic, behavioral and seminogram aspects are considered. The values reported herein define the characteristics of the alpaca semen that could be considered as the initial base of the seminal analysis to select male alpacas before mating.

Frank, E.N.; Renieri, C.; Hick, M.V.H.; la Manna, V.; Gauna, C.D.; Lauvergne, J.J. **Segregation analysis of irregular spotting and full white in llama.** In: *Proceedings of the 7th World Congress on Genetics Applied to Livestock Production, Montpellier, France, August, 2002 Session 12*. 2002: 0-4. ISBN: 2738010520.

Descriptors: llamas, animal fibers, coat colors, phenotypic relationships, white, irregular spotted, self colored, alleles autosomes, chromosomes crossing, dominance, epistasis, inheritance, genetics, segregation.

Gauly, M.; Vaughan, J. **Endoparasite infections in alpacas (*Lama pacos*) in relation to their genetic background.**

In: *Proceedings of the 7th World Congress on Genetics Applied to Livestock Production, Montpellier, France, August, 2002 Session 7*. &n bsp; 2002: 0-3. ISBN: 2738010520.

Descriptors: 92 alpacas, crias, age differences, 5 different sires, feces survey for parasites, parasitoses, genetic based resistance, helminth ova, *Nematodirus* sp., Trichostrongylidae.

Genin, D.; Abasto, P.; Choque, S.; Magne, J. **Dung ash treatment of a native forage to improve livestock feeding in low-input Andean pastoral systems.** *Livestock Research for Rural Development*. 2002; 14(2): 1-7. ISSN: 0121-3784.

Descriptors: llamas, sheep, livestock feeding study, *Festuca orthophylla*, paja brava bunch grass, alkali treatment of sodium hydroxide + urea or dung ash + urea to improve nutrient digestibility, 4 comparative feeding and digestibility studies, alkali treatments improved nutritive value, feeding management for low-input substance farming, Andean Group.

Gionfriddo, Juliet R. **Cataracts in New World camelids (llamas, alpacas, vicunas, and guanacos).** *Veterinary Clinics of North America Exotic Animal Practice*. 2002 May; 5(2): 357-369. ISSN: 1094-9194.

NAL call no.: SF997.5.E95E97

Descriptors: llamas, alpacas, vicunas, guanacos, South American camelids, eye disorders, treatment, causes.

Gionfriddo, Juliet R.; Blair, Michael. **Congenital cataracts and persistent hyaloid vasculature in a llama (*Lama glama*)**. *Veterinary Ophthalmology*. 2002 Mar; 5(1): 65-70. ISSN: 1463-5216.

NAL call no.: SF891.V47

Descriptors: llama, young animals, case study, bilateral cataracts, surgical correction, tissue treatment, viscoelastic endothelial protectants, anti-inflammatories, irrigating solution.

Abstract: A 9-month-old llama was evaluated for apparent blindness. Bilateral cataracts were diagnosed and cataract surgery was performed on the right eye. At the time of surgery persistent hyperplastic primary vitreous, persistent hyperplastic tunica vasculosa lentis, and a persistent hyaloid artery were observed. Prior to surgery Power Doppler ultrasound revealed a patent tunica vasculosa lentis OS. Despite reports of a poor success rate for llama cataract surgery, through use of careful tissue handling, phacoemulsification, viscoelastic endothelial protectants, anti-inflammatories, and BSS-Plus irrigating solution, vision was successfully restored in both eyes of the llama.

Gomez, G.; Ratto, M.H.; Berland, M.; Wolter, M.; Adams, G.P. **Superstimulatory response and oocyte collection in alpacas**. *Theriogenology*. January 2, 2002; 57(1): 584. ISSN: 0093-691X. Note: Proceedings of the Annual Conference of the International Embryo Transfer Society, Foz do Iguassu, Parana, Brazil, January 12-15, 2001.

NAL call no.: QP251.A1T5

Descriptors: alpacas, females, egg collection, superovulation, hormone treatment, methods, techniques.

Hackenbroich, Ch.; Gerwing, M.; Litzke, L.F. **Chirurgische Therapie einer Femurspiralfraktur beim Lama (*Lama glama*)**. [**Surgical repair of a femur spiral fracture in a llama (*Lama glama*)**.] *Tieraerztliche Praxis Ausgabe G Grosstiere Nutztiere*. 2002; 30(1): 58-62. ISSN: 1434-1220. Note: In German with an English summary.

Descriptors: llama, femur, spiral fracture, surgical repair, case study.

Hamir, A.N.; Smith, B.B. **Severe biliary hyperplasia associated with liver fluke infection in an adult alpaca**.

Veterinary Pathology. 2002 Sep; 39(5): 592-594. ISSN: 0300-9858.

NAL call no.: 41.8 P27

Descriptors: llamas, adult animal, internal parasitic diseases, *Fasciola hepatica*, liver fluke infection, biliary hyperplasia.

Heath, A.M.; Pugh, D.G.; Sartin, E.A.; Navarre, B.; Purohit, R.C. **Evaluation of the safety and efficacy of testicular biopsies in llamas**. *Theriogenology*. 2002 Oct; 58(6): 1125-1130. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, reproductive function, needle biopsy of testes, histologic examination of tissue, safety and efficacy of the procedure, seminiferous tubules, scrotum, body temperature, thermography, histology.

Abstract: Evaluation of the reproductive function of *Lama glama* is generally considered to be a challenging task due to the difficulty of obtaining representative semen samples. One method that has been proposed for evaluation of testicular function in these animals is histologic examination of testicular needle biopsies. This study was undertaken to examine the safety and efficacy of using needle biopsies to assess testicular function in this species. One randomly selected testicle from each of 16 sexually mature llamas was biopsied with a 14-gauge self-firing biopsy instrument. The llamas were evaluated over a 6-week period with thermography for temperature changes of the scrotum. At the end of the 6-week trial, the llamas were castrated and sections of each testis were fixed in Bouin's solution for histologic examination. Immediately prior to castration, an additional biopsy was taken from each testis to compare the tissue obtained via biopsy with sections from the corresponding testis obtained after castration. A qualitative grading scale was used to compare the seminiferous tubules from each testis. No difference was found between the biopsied and the nonbiopsied testes ($P = 0.69$). The percentage of normal tubules between the biopsied and the nonbiopsied sides also did not differ ($P = 0.70$). Furthermore, the percentage of normal seminiferous tubules did not differ between the needle biopsy samples and the corresponding tissue samples obtained at castration ($P = 0.48$). The number of round seminiferous tubules counted in each biopsy section ranged from 3 to 67. There was no significant difference in the thermographic images of the scrotum between the biopsied and the nonbiopsied testes. This study supports testicular biopsies as a safe and useful procedure in the evaluation of testicular function.

Herrera, E.A.; Riquelme, R.A.; Sanhueza, E.M.; Raggi, L.A.; Llanos, A.J. **Use of fetal biometry to determine fetal age in late pregnancy in llamas**. *Animal Reproduction Science*. 2002 Nov; 4(1/2): 101-109. ISSN: 0378-4320.

NAL call no.: QP251.A5

Descriptors: llamas, fetal development, determination of fetal age, gestation period, pregnancy, reproduction biometry, weight, diameter, fetal length, fetal limbs, mathematical models, newborn animals.

Ivany, Jennifer M.; Anderson, David E.; Birchard, Stephen J.; Mattoon, John R.; Neubert, Brad G. **Portosystemic shunt in an alpaca cria.** *Journal of the American Veterinary Medical Association.* June 1, 2002; 220(11): 1652; 1696-1699. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: alpaca, 5 month old cria, diarrhea, poor growth, colonic vein shunt, surgical correction, case study.

Janis, Christine M.; Theodor, Jessica M.; Boisvert, Bethany. **Locomotor evolution in camels revisited: A quantitative analysis of pedal anatomy and the acquisition of the pacing gait.** *Journal of Vertebrate Paleontology.* 14 March, 2002; 22(1): 110-121. ISSN: 0272-4634.

Descriptors: llamas, camels, pacing gait, measurements, metapodials, phalanges, comparison to extinct camelids, Tertiary of North America, Oligocene, early Miocene, evolution.

Jarvinen, J.A.; Miller, J.A.; Oehler, D.D. **Pharmacokinetics of ivermectin in llamas (*Lama glama*).** *Veterinary Record* (London). Mar 2002; 150(11): 344-346. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, ivermectin, pharmacokinetics, pour on formulations, oral administration, controlled release, subcutaneous injection.

Jones, C.J.P.; Abd Elnaeim, M.; Bevilacqua, E.; Oliveira, L.V.; Leiser, R. **Comparison of uteroplacental glycosylation in the camel (*Camelus dromedarius*) and alpaca (*Lama pacos*).** *Reproduction.* 2002 Jan; 123(1): 115-126. ISSN: 1470-1626.

NAL call no.: QP251.J75

Descriptors: camels, alpacas, comparison study, glycosylation of fetal and maternal tissues, interspecies differences, camelid hybrids, placentae, viability of hybrid pregnancies, embryo transplantation.

Abstract: The recent birth of a camel-llama hybrid, after numerous failed attempts, has prompted an investigation into the glycosylation of apposing fetal and maternal tissues of pregnant camels and alpacas. This study was undertaken to determine whether interspecies differences in glycans are factors that may account in part for the difficulty in producing a viable hybrid. Specimens of camel placentae from day 60 to day 375 of gestation and alpaca placentae from day 22 to term (approximately 345 days) were fixed and embedded in resin, and sections were stained with a panel of 19 biotinylated lectins and an avidin--peroxidase revealing system. Several qualitative interspecies differences in tissue glycosylation were found, mainly in the trophoblast, and especially with respect to bi/tri-antennary bisected N-glycan, fucosylated structures, beta-galactosyl residues and sialyl termini. In the maternal uterine epithelium, differences were found mainly in bi/tri-antennary bisected complex N-glycan and beta-galactosyl residues, indicating that there is more conservation of glycosylation in maternal tissues compared with trophoblast. There were also many quantitative differences in the distribution of glycans. It is possible that a failure to effect the normal glycan--glycan complementation that occurs at the cell surface between maternal and fetal tissues during the implantation processes of apposition and adhesion may account in part for the difficulty in establishing a viable pregnancy between these two species.

Kuch, M.; Rohland, N.; Betancourt, J.L.; Latorre, C.; Stepan, S.; Poinar, H.N. **Molecular analysis of a 11,000-year-old rodent midden from the Atacama Desert, Chile.** *Molecular Ecology.* 2002; 11(5): 913-924. ISSN 0962-1083.

NAL call no.: QH540.M64

Descriptors: plants, animals, vicuna, birds, rodents.

Lattanzi, M.; Santos, C.; Chaves, G.; Miragaya, M.; Capdevielle, E.; Judith, E.; Aguero, A.; Baranao, L.

Cryopreservation of llama (*Lama glama*) embryos by slow freezing and vitrification. *Theriogenology.* January 2, 2002; 57 (1): 585. ISSN: 0093-691X. Note: Proceedings of the Annual Conference of the International Embryo Transfer Society, Foz do Iguassu, Parana, Brazil, January 12-15, 2001.

NAL call no.: QP251.A1T5

Descriptors: llamas, embryos, cryopreservation, slow temperature reduction, vitrification, methods and techniques.

Leoni, L.; Miragaya, M.H.; Lager, I.; Lomonaco, M.; Fondevila, N.; Agüero, A.; Baranao, L.; Schudel, A.A. **Bovine Herpes Virus-1 DNA detection in *Lama glama* embryos previously infected and washed.** *Theriogenology*. January 2, 2002; 57(1): 573. ISSN: 0093-691X. Note: Proceedings of the Annual Conference of the International Embryo Transfer Society, Foz do Iguassu, Parana, Brazil, January 12-15, 2001.

NAL call no.: QP251.A1T5

Descriptors: llama, embryos, infectious agent, Bovine Herpes Virus 1, bovine viral disease.

Llanos, Anibal J.; Riquelme, Raquel A.; Sanhueza, Emilia M.; Herrera, Emilio; Gertrudis; Giussani, Dino A.; Parer, Julian T. **Regional brain blood flow and hemispheric oxygen consumption during acute hypoxaemia in the llama fetus.** *Journal of Physiology*. 2002 Feb 1; 538(Pt. 3): 975-983. ISSN: 0022-3751.

NAL call no.: 447.8 J82

Descriptors: llamas, live fetuses, hypoxaemia, cerebral hemispheric oxygen, O₂, Frick principle, hemispheric metabolism.

Abstract: Unlike fetal animals of lowland species, the llama fetus does not increase its cerebral blood flow during an episode of acute hypoxaemia. This study tested the hypothesis that the fetal llama brain maintains cerebral hemispheric O₂ consumption by increasing cerebral O₂ extraction rather than decreasing cerebral oxygen utilisation during acute hypoxaemia. Six llama fetuses were surgically instrumented under general anaesthesia at 217 days of gestation (term ca 350 days) with vascular and amniotic catheters in order to carry out cardiorespiratory studies. Following a control period of 1 h, the llama fetuses underwent 3 x 20 min episodes of progressive hypoxaemia, induced by maternal inhalational hypoxia. During basal conditions and during each of the 20 min of hypoxaemia, fetal cerebral blood flow was measured with radioactive microspheres, cerebral oxygen extraction was calculated, and fetal cerebral hemispheric O₂ consumption was determined by the modified Fick principle. During hypoxaemia, fetal arterial O₂ tension and fetal pH decreased progressively from 24 +/- 1 to 20 +/- 1 Torr and from 7.36 +/- 0.01 to 7.33 +/- 0.01, respectively, during the first 20 min episode, to 16 +/- 1 Torr and 7.25 +/- 0.05 during the second 20 min episode and to 14 +/- 1 Torr and 7.21 +/- 0.04 during the final 20 min episode. Fetal arterial partial pressure of CO₂ (P(a,CO₂), 42 +/- 2 Torr) remained unaltered from baseline throughout the experiment. Fetal cerebral hemispheric blood flow and cerebral hemispheric oxygen extraction were unaltered from baseline during progressive hypoxaemia. In contrast, a progressive fall in fetal cerebral hemispheric oxygen consumption occurred during the hypoxaemic challenge. In conclusion, these data do not support the hypothesis that the fetal llama brain maintains cerebral hemispheric O₂ consumption by increasing cerebral hemispheric O₂ extraction. Rather, the data show that in the llama fetus, a reduction in cerebral hemispheric metabolism occurs during acute hypoxaemia.

Mariasegaram, M.; Pullenayegum, S.; Ali, M.J.; Shah, R.S.; Penedo, M.C.T.; Wernery, U.; Sasse J. **Isolation and characterization of eight microsatellite markers in *Camelus dromedarius* and cross-species amplification in *C. bactrianus* and *Lama pacos*.** *Animal Genetics*. 2002 Oct; 33(5): 385-387. ISSN: 0268-9146.

NAL call no.: QP98.A1A5

Descriptors: camels, dromedaries, alpacas, microsatellite repeats, genetic markers, molecular weight, genetic polymorphism, polymerase chain reaction, PCR, pedigree, molecular sequence data.

Marley, S.E.; Conder, G.A. **The use of macrocyclic lactones to control parasites of domesticated wild ruminants.** In: *Macrocyclic Lactones in Antiparasitic Therapy*. CAB International. Wallingford, UK. 2002: 371-393. ISBN: 0851996175.

NAL call no.: RM412.M33 2002

Descriptors: anthelmintics, disease control, macrocyclic lactones, ivermectin, drug therapy and residues, pharmacokinetics, many animals and parasites tested, alpacas, llamas, guanacos, buffalo, elk, Bactrian camels, dromedary camels, *Amblyomma americanum*, *Bison bonasus*, buffalos, goats, various species of deer, reindeer, *Bunostomum*, *Camelostromylus mentulatus*, *Cephenemyia trompe*, *Chabertia ovina*, *Cooperia*, *Dictyocaulus viviparus*, *Elaphostromylus rangiferi*, *Haematopinus tuberculatus*, *Haemonchus contortus*, *Haemonchus longistipes*, *Hypoderma bovis*, *Hypoderma diana*, *Hypoderma tarandi*, *Ixodes scapularis*, *Linguatula*, *Linognathus africanus*, *Nematodirus*, *Oesophagostomum columbianum*, *Oesophagostomum venulosum*, *Ostertagia ostertagi*, *Otobius megnini*, *Parelaphostromylus tenuis*, *Psoroptes cuniculi*, *Stephanofilaria zaheeri*, *Strongyloides papillosus*, *Toxocara vitulorum*, *Trichostrongylus axei*, *Trichostrongylus colubriformis*, *Trichostrongylus probolurus*, *Trichostrongylus vitrinus*, *Trichuris discolor*, *Trichuris ovis*, *Impalpaia tuberculata*, *Lamanema chavezii*.

McGregor, B.A. **Comparative productivity and grazing behaviour of Huacaya alpacas and Peppin Merino sheep grazed on annual pastures.** *Small Ruminant Research*. June, 2002; 44(3): 219-232. ISSN: 0921-4488

NAL call no.: SF380.I52

Descriptors: Huacaya alpacas, Peppin Merino sheep, improved pasture, grazing preferences, nutrient values of pasture, seasonal affects on fiber characteristics, growth, diameter, curvature, staple strength, resistance to compression, staple crimp, Australia.

Abstract: Adult Huacaya alpaca (mixed sex, mean +/- S.D., age 5.2 +/- 2.7 years, live weight 72.0 +/- 9.5 kg) were grazed with Peppin Merino sheep (castrated male, age 3 +/- 0.1 years, live weight 54.0 +/- 3.9 kg) for 2 years on improved annual pasture at commercial grazing pressures (10-17 dry sheep equivalents/ha) near Melbourne, Australia. Alpacas and sheep gained weight during the first year and then lost weight (proportional loss: alpacas 22%, sheep 20%, NS) before commencing weight gain. Twice the alpacas gained when the sheep lost weight ($P < 0.001$). Alpacas lost weight when green pasture was < 0.5 t DM/ha and gained weight when green pasture exceeded 0.5 t DM/ha. The pasture was not grazed evenly. The behaviour of alpacas indicated a strong preference for short green grazed pasture and they generally avoided long dry grass. The alpacas did not increase the utilisation of the pasture until increased grazing pressure resulted in an expansion of the area utilised. Midside wool and alpaca fibre growth rates were depressed when animals lost weight and increased when animals gained weight. The effects of the adverse nutritional conditions on alpaca were: a significant reduction in clean fibre growth (CFW) 2.86 vs 1.91 kg, $P < 0.001$; clean washing yield (CWY) 95.2 vs 91.5%, $P < 0.001$; mean fibre diameter (MFD) 37.5 vs 35.2 micrometers, $P < 0.01$; staple length (SL) 94 vs 77 mm, $P < 0.001$; SL/MFD ratio 2.50 vs 2.20, $P < 0.001$; an increase in mean fibre diameter coefficient of variation (MFD CV) 23.3 vs 25.1%, $P < 0.05$; fibre curvature (FC) 24.6 vs 26.4 degrees/mm, $P < 0.1$ and no change in staple strength (SS) 54 vs 46 N/ktex; resistance to compression (Rc) 5.1 vs 5.1 kPa; staple crimp (SC) 1.2 vs 1.1 cm⁻¹. The effects on wool were: a significant reduction of CFW 4.12 vs 3.42 kg, $P < 0.001$; CWY 73.7 vs 69.1%, $P < 0.001$; MFD 22.4 vs 20.5 micrometers, $P < 0.001$; SL 96 vs 76 mm, $P < 0.001$; SS 54 vs 40 N/ktex, $P < 0.001$; an increase in MFD CV 16.1 vs 18.0%, $P < 0.005$; FC 97.9 vs 105.5 degrees/mm, $P < 0.005$ and little change in SL/MFD ratio 4.43 vs 4.17, $P < 0.1$; Rc 10.0 vs 10.4 kPa, ns; SC 5.8 vs 5.7 cm⁻¹, ns. The live weight, fibre productivity and fibre attributes of Huacaya alpacas and Merino sheep were substantially affected by seasonal nutritional conditions in a similar manner. The annual clean alpaca fibre growth was affected to a greater extent than the annual wool growth (decline of 33 vs 17%). Under conditions when green pasture availability was < 0.5 t DM/ha, alpacas utilised pasture more effectively than sheep. Managers can manipulate the provision of pasture to manage live weight change and manipulate alpaca productivity and fibre quality.

Messick, Joanne B.; Walker, Pamela G.; Raphael, William; Berent, Linda; Shi, Xun. '*Candidatus Mycoplasma haemodidelphidis*' sp. nov., '*Candidatus Mycoplasma haemolamae*' sp. nov. and *Mycoplasma haemocanis* comb. nov., haemotrophic parasites from a naturally infected opossum (*Didelphis virginiana*), alpaca (*Lama pacos*) and dog (*Canis familiaris*): Phylogenetic and secondary structural relatedness of their 16S rRNA genes to other mycoplasmas. *International Journal Systematic & Evolutionary Microbiology*. May, 2002; 52(3): 693-698. ISSN: 1466-5026.

NAL call no.: QR1.I577

Descriptors: alpaca, opossum, dog, hemotrophic bacteria, newly characterized species, new group of Mycoplasma, phylogenetic affiliation, molecular genetics.

Miragaya, M.H.; Chaves, M.G.; Capdevielle, E.F.; Ferrer, M.S.; Pinto, M.; Rutter, B.; Neild, D.M.; Agüero, A. **In vitro maturation of llama (*Lama glama*) oocytes obtained surgically using follicle aspiration.** *Theriogenology*. January 2, 2002; 57(1): 731. ISSN: 0093-691X. Note: Proceedings of the Annual Conference of the International Embryo Transfer Society, Foz do Iguassu, Parana, Brazil, January 12-15, 2001.

NAL call no.: QP251.A1T5

Descriptors: llama, eggs, oocytes, invitro development, surgical methods and techniques, follicle aspiration.

Nagy, D.W.; Chakwenya, J.; Tyler, J.W.; Holle, J. **A note on colostral immunoglobulin G concentrations vs. subsequent serum concentrations in naturally suckled llama (*Lama glama*) and alpaca (*Lama pacos*) crias.** *Journal of Camel Practice and Research*. 2002; 9(2): 171-172. ISSN: 0971-6777.

NAL call no.: SF997.5.C3J68

Descriptors: alpacas, llamas, newborn animals, colostral immunity, colostrums, IgG, immune serum, immunity.

Nagy, D.W.; Lakritz, J.; Tyler, J.W.; Jarboe, J.; Loiacono, C.M.; Haddad, M.F. **The treatment of suspected cerebrospinal nematodiasis with moxidectin in 3 llamas (*Lama glama*).** *Journal of Camel Practice and Research*. 2002; 9(2): 145 -149. ISSN: 0971-6777.

NAL call no.: SF997.5.C3J68

Descriptors: llamas, suspected cerebrospinal nematodiasis, parasitic nematodes, *Paralaphostrongylus tenuis*, clinical aspects, blood chemistry, blood picture, leukocyte counts, cerebrospinal fluid analysis, drug therapy, moxidectin, case reports, *Paralaphostrongylus*, Illinois, United States.

Neyra, Victor; Chavarry, Elizabeth; Espinoza, Jose R. **Cysteine proteinases Fas1 and Fas2 are diagnostic markers for *Fasciola hepatica* infection in alpacas (*Lama pacos*).** *Veterinary Parasitology*. 2002 Apr 19; 105(1): 21-32. ISSN: 0304-4017.

NAL call no.: SF810.V4

Descriptors: alpacas, antibodies, ELISA, *Fasciola hepatica*, serological assay parameters, immunodiagnostic technique.

Abstract: Circulating antibody against *Fasciola hepatica* antigens was determined by enzyme-linked immunosorbent assay (ELISA) and immunoelectrophoresis in alpacas naturally exposed to *F. hepatica*. Serological assay parameters were established by using sera from eight infected animals and seven controls with no record of this parasitic infection. Excretory--secretory (ES-) products, Fas1- and Fas2-ELISA were used to survey 307 alpacas from a *F. hepatica* endemic area in the Peruvian Andes. Seroprevalence of *F. hepatica* infection varied from 56.7, 64.8 and 66.8% measured by Fas1-, Fas2- and ES-ELISA, respectively. The sensitivity for ES-ELISA was 95%, corresponding Fas1- and Fas2-ELISA sensitivity values were 90 and 95%. In this population, 7% of animals were positive for *F. hepatica* eggs in faeces, other parasites detected were *Trichuris* sp. (40%), *Nematodirus* sp. (34.6%), *Lamanema* sp. (12.8%) and *Eimeria* sp. (11.8%). The results show that *F. hepatica* infected animals elicit circulating antibodies against ES, Fas1 and Fas2. Fas2-ELISA may be proposed as a sensitive assay for the immunodiagnosis of fasciolosis in alpacas.

Parker, Jill E.; Timm, Karen I.; Smith, Bradford B.; Van Saun, Robert J.; Winters, Kerri M.; Sukon, Peerapol; Snow, Christine M. **Seasonal interaction of serum vitamin D concentration and bone density in alpacas.** *American Journal of Veterinary Research*. 2002 Jul; 63(7): 948-953. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: alpacas, males, seasonal variations, serum analysis, calcium, phosphorus, vitamin D, feed concentrations, bone mineral density.

Abstract: **OBJECTIVE:** To evaluate temporal changes in bone mineral density associated with seasonal variation in serum vitamin D, calcium, and phosphorus concentrations in alpacas. **ANIMALS:** 5 healthy mature neutered male alpacas. **PROCEDURE:** Metacarpal bone mineral density was measured at 4 times during a year. Each time alpacas were weighed, blood was collected for determination of serum calcium, phosphorus, and vitamin D concentrations, and samples of feed were analyzed for nutrient content. Vitamin D status was determined by use of an assay that measured serum 25-hydroxycalciferol concentration. Effects of changes in serum vitamin D, calcium, and phosphorus concentration and body weight with season on bone mineral density were determined. **RESULTS:** Bone mineral density, body weight, and serum vitamin D and phosphorus concentrations varied with season. Bone mineral density, serum vitamin D concentration, and body weight also varied among individual alpacas. Serum vitamin D concentration was lower in January than the previous October and increased from May to the following September. The decrease in bone mineral density lagged behind the decrease in serum vitamin D concentration and was lower in May, compared with the previous October. Body weight was lower in May than the previous October or following September. Solar radiation was highest in July and lowest in December. **CONCLUSIONS AND CLINICAL RELEVANCE:** Seasonal changes in bone mineral density are associated with changes in serum vitamin D concentrations in alpacas. Changes in bone mineral density associated with a decline in serum vitamin D concentration may predispose some alpacas to developing fractures minimal trauma.

Parker, Jill E.; Semevolos, Stacy A. **Use of a parainguinal approach for cryptorchidectomy in alpacas.** *Journal American Veterinary Medical Association*. 2002 Jun 15; 220(12): 1835-6, 1797-1798. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, cryptorchidism, surgical treatment, parainguinal incision, case study.

Abstract: Cryptorchidism, is an uncommon condition in llamas and alpacas, and there are no reports detailing surgical management of this condition in llamas or alpacas; however, flank or ventral midline approaches have been mentioned.

Cryptorchid castration was performed by use of a parainguinal approach in 2 alpacas. The retained testicle of each alpaca was found on the ventral aspect of the abdomen, just caudal to the incision in 1 alpaca and at the cranial edge of the incision in the other. The testicle was approximately 1 X 0.5 cm in 1 alpaca and 2 X 1 cm in the other. In an alpaca or llama with a single abdominal testicle and no history of surgery, the parainguinal approach has several advantages, including the likely proximity of the testicle to the incision; the small incision, which can be extended if needed; ease of closure; and minimal aftercare. The retained testicles were small and could be difficult to find from a more distant midline, paramedian, or flank incision.

Pidre, G.A.; Eguinoa, G.; Iribarren, F.E. **Sarcocystosis en llamas (*Lama glama*) en el norte argentino. [Sarcocystosis in llamas (*Lama glama*) in northern Argentina.]** *Veterinaria Argentina*. 2002; 19(186): 430-433. ISSN: 0326-4629. Note: In Spanish with an English summary.

NAL call no.: 41.8 G112

Descriptors: llamas, domesticated animals, sudden deaths, post mortem examination, *Sarcocystis* sp., intercostal muscles, myocardium had parasites, clinical aspects, protozoal infections, Argentina.

Powell, Cynthia C.; Nuhsbaum, Tanja M.; Gionfriddo, Juliet R. **Aqueous misdirection and ciliary block (malignant) glaucoma after cataract removal in a llama.** *Veterinary Ophthalmology*. 2002 Jun; 5(2): 99-101. ISSN: 1463-5216.

NAL call no.: SF891.V47

Descriptors: llama, ciliary block glaucoma, cataract surgery, vitrectomy, surgical complications of cataract surgery, case report.

Abstract: Ciliary block (malignant) glaucoma is caused by the posterior flow of aqueous humor into or behind the vitreous. It is a rare complication of anterior segment surgery in humans. This is a report of ciliary block glaucoma occurring as a postoperative complication of cataract surgery in a llama. Medical management was ineffective in lowering intraocular pressure (IOP). Posterior capsulotomy and anterior hyaloid disruption with a 22-gauge needle, in addition to medical management maintained IOP in the normal range until anterior vitrectomy could be performed. After vitrectomy, glaucoma resolved and medical treatment was no longer necessary.

Prado, Tulio M.; Morgan, Gregor L.; Prado, Maria E.; Bahr, Robert J.; Streeter, Robert N.; Emmett, Gregory. **Case report: Urethrovaginal fistula in a llama.** *Bovine Practitioner*. February, 2002; 36(1): 22-26. ISSN: 0524-1685

NAL call no.: SF779.5.A1B6

Descriptors: llama, female, adult, case study, urinary incontinence, scalding of the perineum and rear limbs, urethrovaginal fistula, surgical correction.

Pugh, D.G. **Care of the pregnant llama.** *Proceedings of the North American Veterinary Conference*. 2002; 16: 188-190. Note: In volume *Large Animal*. Part of a three volume set. Meeting held January 12-16, 2002, Orlando, Florida.

NAL call no.: SF605.N672

Descriptors: *Lama* species, care and management of pregnant females, reproduction in captivity.

Pugh, D.G. **Pregnancy diagnosis using ultrasound in sheep, goats, and llamas.** *Proceedings of the North American Veterinary Conference*. 2002; 16: 193. Note: In volume *Large Animal*. Part of a three volume set. Meeting held January 12-16, 2002, Orlando, Florida.

NAL call no.: SF605.N672

Descriptors: sheep, goats, llamas, ultrasound for pregnancy diagnosis.

Pugh, D.G. **Small ruminant and llama parasite management.** *Proceedings of the North American Veterinary Conference*. 2002; 16: 191-192. Note: In volume *Large Animal*. Part of a three volume set. Meeting held January 12-16, 2002, Orlando, Florida.

NAL call no.: SF605.N672

Descriptors: sheep, goats, llamas, parasites.

Ramos Vara, Jose A.; Miller, Margaret A. **Metastatic pulmonary adenocarcinoma in a llama (*Lama glama*).** *Journal of Veterinary Diagnostic Investigation*. 2002 Jul; 14(4): 328-31 ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llama, adult female, case study, pulmonary adenocarcinoma, neoplastic tissue.

Abstract: An adult female llama with a comminuted fracture of the left femoral head was necropsied. A firm multinodular mass infiltrated skeletal muscle adjacent to the fracture. Multiple, firm, white nodules were in the pulmonary parenchyma and pleura. A single nodule was in the liver. Microscopically, transition from nonneoplastic bronchiolar epithelium to neoplastic epithelium that formed acinar structures was evident at bronchioalveolar junctions. A diagnosis of pulmonary adenocarcinoma was made. Similar neoplastic tissue was in the liver and in the perifemoral mass. Immunohistochemically, neoplastic cells were positive for pan-cytokeratin, cytokeratin 7, and cytokeratin 5/6 antibodies and negative for vimentin and cytokeratins 8/18 and 20.

Ratto, M.H.; Berland, M.; Adams, G.P. **Ovarian superstimulation and ultrasound-guided oocyte collection in llamas.** *Theriogenology*. January 2, 2002; 57(1): 590. ISSN: 0093-691X. Note: Proceedings of the Annual Conference of the International Embryo Transfer Society, Foz do Iguassu, Parana, Brazil, January 12-15, 2001.

NAL call no.: QP251.A1T5

Descriptors: llamas, egg collection, super ovulation, ultrasound techniques, oocyte recovery method.

Renieri, C.; Frank, E.N.; Hick, M.V.H.; la Manna, V.; Gauna, C.D.; Lauvergne, J.J. **Segregation analysis of coat colour phenotypes in llama.** In: *Proceedings of the 7th World Congress on Genetics Applied to Livestock Production, Montpellier, France, August, 2002-Session 12*. 2002; 0-4. ISBN: 2738010520.

Descriptors: llamas, alleles, animal fibers, natural colors, color inheritance, autosomes, chromosomes, crossing, dominance, loci, phenotypic segregations, recessiveness.

Renisio, Jean Guillaume; Perez, Janice; Czisch, Michael; Guenneugues, Marc; Bornet, Olivier; Frenken, Leon; Cambillau, Christian; Darbon, Herve. **Solution structure and backbone dynamics of an antigen-free heavy chain variable domain (VHH) from llama.** *Proteins*. 2002 Jun 1; 47(4): 546-55. ISSN: 1097-0134.

Descriptors: dromedaries, camels, llamas, heavy chain antibody types, VHH, NMR spectroscopy, structure.

Abstract: Camelids, (dromedaries, camels, and llamas) produce heavy-chains antibodies, with their antigen recognition sites composed of a single VH-like domain, referred to as VHH. The solution structure of one of these VHHs domains (VHH-H14), raised against the alpha subunit of the human chorionic gonadotropin hormone (hCG), has been determined by (15)N heteronuclear three-dimensional NMR spectroscopy. The framework is well resolved within the set of 20 best-calculated NMR structures and is close to that of classical VH domains from vertebrate antibodies, consisting of two antiparallel beta-sheets organized in a beta-barrel. Loops display a lower precision, especially the Complementarity Determining Regions (CDRs), involved in antigen recognition. Comparison of the three-dimensional VHH-H14 solution structure with its previously solved crystal structure (Spinelli et al., *Nature Struct. Biol.* 1996;3:752-757) reveals a high similarity to the framework, whereas significant conformational differences occur on CDRs, leading to the assumption that the antigen recognition site is a more mobile part. In order to deepen our insights into the dynamics of VHH-H14 in solution, (15)N relaxation was measured with longitudinal R1 and transverse R2 self-relaxation rates, and (15)N steady-state heteronuclear nuclear Overhauser enhancements (NOE), making it possible to probe picosecond-to-millisecond internal motions. Determination of dynamic parameters (S(2), tau(e), and Rex) through the Lipari-Szabo Model-free approach enables the identification of several regions with enhanced dynamics. Especially, the mobility measurements from NMR confirm that the antigen recognition site is the most mobile part of the VHH-H14 domain on picosecond-to-nanosecond fast time scales. Several residues belonging to the three CDRs are submitted to chemical exchange processes occurring on slow microsecond-to-millisecond time scales, suggesting that the formation of the VHH/antigen complex should be accompanied by structural changes.

Su, Chen; Nguyen, Viet Khong; Nei, Masatoshi. **Adaptive evolution of variable region genes encoding an unusual type of immunoglobulin in camelids.** *Molecular Biology and Evolution*. 2002 Mar; 19(3): 205-215. ISSN: 0737-4038.

NAL call no.: QH506.M642

Descriptors: Camelidae, llamas, dimeric immunoglobulin (Ig) structure, evolution, adaptations, VHH genes, immune function.

Abstract: A typical immunoglobulin (Ig) molecule is composed of four polypeptide chains: two identical heavy (H) chains and two identical light (L) chains. This tetrameric structure is conserved in almost all jawed vertebrate species. However, it has been discovered that camels and llamas (family: Camelidae) possess a type of dimeric Ig that consists of two H chains only. These H chains do not associate with L chains, and they do not have the first constant region (CH1), which is present in the conventional Ig. In spite of these changes, the dimeric Ig maintains the normal immune function. To understand the evolution of the dimeric Ig, we studied the phylogenetic relationships of the variable region

(V(H)H) genes of the dimeric Ig from Camelidae and those (V(H)) of the conventional Ig from mammals. The results showed that the V(H)H genes form a monophyletic cluster within one of the mammalian V(H) groups, group C. We examined the type of selective force in complementarity-determining regions (CDRs) and framework regions (FRs) by comparing the rate of synonymous (dS) and nonsynonymous (dN) substitutions. We found that the results obtained from V(H)H genes were similar to those from V(H) genes in that CDRs showed an excess of dN over dS (indicating positive selection), whereas the reverse was true for FRs (purifying selection). However, when the extent of positive selection or purifying selection was investigated at each codon site, three major differences between V(H)H and V(H) genes were found. That is, very different types of selective force were observed between V(H)H and V(H) genes (1) at the sites that contact the L chain in the conventional Ig, (2) at the sites that interact with the CH1 region in the conventional Ig, and (3) in the H1 loop. Our findings suggest that adaptive evolution has occurred in the functionally important sites of the V(H)H genes to maintain the normal immune function in the dimeric Ig.

Summerfield, N.; Baird, A.N.; Boston, R. **Reference ranges for prothrombin time, activated partial thromboplastin time and platelet count in llamas and alpacas.** *Comparative Clinical Pathology*. 2002 Oct; 11(4): 256-261. ISSN: 1618-5641.

Descriptors: llamas, alpacas, blood factors, platelet counts, prothrombin times, activated partial thromboplastin times, blood clotting, reference values.

Sukemori, Seizi; Kuwayama, Takehito; Ikeda, Shuhei; Yoshida, Yutaka; Sato, Mitsuo; Hanzawa, Kei; Monji, Yasunori; Watanabe, Tadao; Ohmi, Hiroaki; Kurihara, Yoshio; Domeki, Ikuo; Watanabe, Seiki; Maezono, Luis; Flores, Enrique; Ito, S umimaro. **[Shape of hair from genus llama (*Lama*).]** *Journal of Agricultural Science Tokyo Nogyo Daigaku*. 2002 Jun; 47(1): 49-53. ISSN: 0375-9202. Note: In Japanese with an English Summary.

Descriptors: llama, South American camelids, hair morphology, description of hair.

Strauss, Guenter. **Polydaktylie und Arthrogryposis als Ursache einer Dystokie bei einem Vikunja (*Lama vicugna*).** **[Polydactyly and arthrogryposis as cause of dystocia in a vicuna (*Lama vicugna*).**] *Zoologische Garten*. 2002 Sep; 72(5): 372-377. ISSN: 0044-5169. Note: In German with an English summary.

Descriptors: vicuna, arthrogryposis and polydactyly, dystocia, case report.

Tait, S.A.; Kirwan, J.A.; Fair, C.J.; Coles, G.C.; Stafford, K.A. **Parasites and their control in South American camelids in the United Kingdom.** *Veterinary Record* (London). 2002 May; 150(20): 637-638. ISSN: 0042-4900.
NAL call no.: 41.8 V641

Descriptors: alpacas, llamas, parasite control programs, United Kingdom.

Vila, Bibiana. **La silvestria de las vicunas, una característica esencial para su conservación y manejo.** **[The wilderness of the vicunas: An essential issue for conservation and management.]** *Ecologia Australis*. 2002 Jun; 12(1): 79-82. ISSN: 0327-5477. Note: In Spanish.

Descriptors: vicunas, conservation, resource management, population genetics relationships, South America.

von Baer, A.; Del Campo, M.R.; Donoso, X.; Toro, F.; von Baer L.; Montecinos, S.; Rodriguez Martinez, H.; Palasz, A.T. **Vitrification and cold storage of llama (*Lama glama*) hatched blastocysts.** *Theriogenology*. January 2, 2002; 57(1): 489. ISSN: 0093-691X. Note: Proceedings of the Annual Conference of the International Embryo Transfer Society, Foz do Iguassu, Parana, Brazil, January 12-15, 2001.

NAL call no.: QP251.A1T5

Descriptors: llama, blastocysts, cold storage techniques, vitrification, embryos.

Vranken, Wim; Tolkatheev, Dmitri; Xu, Ping; Tanha, Jamshid; Chen, Zhigang; Narang, Saran; Ni, Feng. **Solution structure of a llama single-domain antibody with hydrophobic residues typical of the VH/VL interface.** *Biochemistry*. 2002 Jul 9; 41(27): 8570-8579. ISSN: 0006-2960.

NAL call no: 381 B523

Descriptors: llama, antibody, BrucD4-4, NMR spectroscopy, VH, V(H)H, differentiating from murine and human VHs, molecular structure, surface characteristics, hydrophobicity.

Waguespack, Richard W.; Belknap, Ellen B.; Spano, Joseph S.; Wenzel, James G.W.; Pugh, David. **Analysis of**

synovial fluid from clinically normal alpacas and llamas. *American Journal of Veterinary Research*. April, 2002; 63 (4): 576-578. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, alpacas, reference range values, synovial fluid, arthrocentesis, radiocarpal and tarsocrural joints, total nucleated cell counts, number and percentages of polymorphonuclear (PMN), mononuclear leukocytes, total protein, specific gravity.

Waguespack, R.W.; Belknap, E.B.; Spano, J.S.; Wenzel, J.G.W.; Pugh, D.G. **Normal synovial fluid analysis in the new world camelid (alpaca and llama).** *Proceedings of the 12th International Symposium on Lameness in Ruminants, Orlando, Florida, USA, 9th 13th January 2002*. 2002: 452-453.

Descriptors: llamas, alpacas, joints, synovial fluid, normal values.

Wood, B. **Living our alpaca dreams.** *Small Farm Today*. 2002 Mar/Apr; 19(2): 41. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: alpacas, marketing, herd improvement, management.

Wurzinger, M.; Delgado, J.; Nurnberg, M.; Ugarte, G.; Valle-Zarate, A.; Stemmer, A.; Solkner, J. **Phenotypic and genetic parameters of growth traits in Bolivian llamas.** In: *Proceedings of the 7th World Congress on Genetics Applied to Livestock Production, Montpellier, France, August, 2002 Session 7*. 2002: 0-4. ISBN: 2738010520.

Descriptors: llamas, growth curves, body measurements, genetic correlation, genetic parameters, growth heritability, phenotypic correlation, sex differences.

Zanolari, P.; Tschudi, M.; Rytz, U.; Steiner, A. **Treatment of temporary upward fixation of the patella in an alpaca by abrasion trochleoplasty and imbrication of the medial retinacular fascia.** *Veterinary Record (London)*. 2002 Jun 15; 150(24): 752-754. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: alpaca, female, abrasion trochleoplasty, fascial imbrication, case study, successful surgery.

Abstract: A two-year-old female alpaca suddenly became lame on its right hindlimb. Eight days later clinical and radiographic examinations showed that the patella had become temporarily fixed within the supratrochlear notch of the femur. Under general anaesthesia an abrasion trochleoplasty followed by fascial imbrication was carried out. After two weeks in supporting slings, the animal put full weight on the leg, and six months after the surgery it showed no signs of lameness or recurrence of the upward fixation.

Zulauf, M.; Bergadano, A.; Steiner, A. **Unilaterale laparoskopische Kryptorchidektomie bei einem Lama.** [**Unilateral laparoscopic cryptorchidectomy in a llama.**] *Schweizer Archiv fuer Tierheilkunde*. May, 2002; 144(5): 233-237. Note: In German. ISSN: 0036-7281.

NAL call no.: 41.8 SCH9

Descriptors: llama, cryptorchism, congenital disease, reproductive system disease/male, case study, anesthesia, laparoscopic cryptorchidectomy.

2001

Adolf, J.E.; Dykes, N.L.; Divers, T.J. **The diagnosis and treatment of a thoracic abscess in an alpaca.** *Australian Veterinary Journal*. 2001 Oct; 79(10): 675-679. ISSN: 0005-0423.

NAL call no.: 41.8 AU72

Descriptors: alpaca, case study and report, thoracic abscess, diagnosis, treatment.

Aubin, M.L.; Gionfriddo, J.R.; Mama, K.R.; Powell, C.C. **Analysis of aqueous humor obtained from normal eyes of llamas and alpacas.** *American Journal of Veterinary Research*. July 2001; 62(7): 1060-1062. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, alpacas, eyes fluids, normal values, chemical composition, sodium, potassium, magnesium, chloride, bicarbonates, phosphorus, glucose, osmotic pressure, pH, animal proteins, species differences.

Baldi, Ricardo; Albon, S.D.; Elston, D.A. **Guanacos and sheep: evidence for continuing competition in arid Patagonia.** *Oecologia* (Berlin). 2001 Dec; 129(4): 561-570. ISSN: 0029-8549.

NAL call no.: QL750.O3

Descriptors: guanacos, sheep, feeding behavior, foraging plant choices, interspecific competition, chubut, arid zone, Argentina.

Barr, B.S.; Seco, O.; Axon, J.; Sleeper, M.M.; Baird, A.N. **Successful treatment of pericarditis in a pregnant llama.** *Journal of Veterinary Emergency and Critical Care*. 2001; 11(4): 287-291. ISSN: 1534-6935.

NAL call no.: SF778.J68

Descriptors: 2 year old pregnant female llama, pericarditis, symptoms, tachycardia, muffled heart sounds, tachypnea, lethargy, diagnosis, electrocardiography showed tachycardia, second degree AV block, electrical alternans, cardiac compromise, pleural effusion, successfully treated with intravenous fluids, systemic antimicrobials, systemic anti-inflammatories, thoracocentesis and eventual pericardiocentesis with daily drainage and lavage, case report.

Bonacic, C.; Franklin, W.L. **Camels and llamas.** In: D. MacDonald (Editor). *The Encyclopedia of Mammals*. Andromedia Oxford Ltd. Press Oxford. 2001: 496-499. ISBN: 08871968711.

Descriptors: camelids, Old World camels, dromedary, Bactrian camels, South American camelids, llamas, guanacos, alpacas, vicunas, characteristics, distribution, taxonomic relationships, natural history.

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*. Feb 2001; 12(1): 41-47. ISSN: 0959-4493.

NAL call no.: SF901.V47

Descriptors: dogs, cats, horses, cattle, llamas, skin, biopsy, microorganisms, antibodies, *Mycobacterium bovis* bcg strain, staining, diagnostic techniques, rapid methods, screening, immunostaining.

Bravo, P. Walter; Fowler, Murray E. **Order Artiodactyla, family Camelidae (guanacos, vicunas). Biology and medicine.** In: Murray E. Fowler; Zalmir S. Cubas (Editors). *Biology, Medicine, and Surgery of South American Wild Animals*. Iowa State University Press; Ames. 2001: 392-401. ISBN: 0813828465.

Descriptors: camelids, captive care and management, veterinary care, physical and chemical restraint, sedation, anesthesia, diseases and disorders, South America.

Burgess, R.G. **Alpacas: an alternative lifestyle.** *AgVentures*. June/July 2001; 5(3): 6-9.

NAL call no.: S441.A475

Descriptors: alpacas, livestock raising, care and handling, ranching, profitability.

Butt, T.D.; Macdonald, D.G.; Crawford, W.H. **Persistent right aortic arch in a mature llama.** *Veterinary Record* (London). Jan 27, 2001; 148(4): 118-119. ISSN: 0042-4900

NAL call no.: 41.8 V641

Descriptors: llamas, aorta structure, vascular congenital abnormalities, clinical aspects, bloat, mature animal, case reports.

Buttolph, L.P.; Coppock, D.L. **Project alpaca: intensified alpaca production leads to privatization of key grazing resources in Bolivia.** *Rangelands*. Apr 2001; 23(2) ; 10-18. ISSN: 0190-0528. Note: In English with a Spanish summary.

NAL call no.: SF85.A1R32

Descriptors: alpacas, livestock production, grazing, privatization of grazing systems, tenure systems, Bolivia.

Cafrune, M.M.; Aguirre, D.H.; Rickard, L.G. **First report of *Lamanema chavez* (Nematoda: Trichostrongyloidea) in llamas (*Lama glama*) from Argentina.** *Veterinary Parasitology*. May 22, 2001; 97(2): 165-168. ISSN: 0304-4017.

NAL call no.: SF810.V4

Descriptors: llamas, Molineidae, parasitic nematodes, *Lamanema chavez*, nematode infections, case reports, new geographic records, Argentina.

Campbell, G.S. **Raising alpacas: Easy to raise and easy to love, let alpacas bring you farming bliss.** *Small Farm*

Today. Mar/Apr 2001; 18(2): 36-40. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: alpacas, wool, livestock raising, care and handling.

Carmalt, J.L.; Baptiste, K.E.; Blakley, B. **Suspect coper [copper] toxicity in an alpaca.** *Canadian Veterinary Journal.* July 2001; 42(7): 554-556. ISSN: 0008-5286. Note: In English with a French summary.

NAL call no.: 41.8 R3224

Descriptors: alpacas, copper poisoning, postmortem examinations, liver, heavy metal toxicity, case reports.

Carroll, Gwendolyn L.; Boothe, Dawn M.; Hartsfield, Sandee M.; Martinez, Elizabeth A.; Spann, Angela C.; Hernandez, Adrian. **Pharmacokinetics and pharmacodynamics of butorphanol in llamas after intravenous and intramuscular administration.** *Journal of the American Veterinary Medical Association.* 2001 November 1; 219(9): 1263-1267. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: llamas, butorphanol, intravenous and intramuscular administration, pharmacokinetics, pharmacodynamics, biochemistry.

Castellaro, G.; Leon, F.; Wackwitz, B.; Raggi, A. **Botanical composition of alpaca (*Lama pacos*) diet and degradability of range forages in the central zone of Chile.** In: Martina Gerken; Carlo Renieri (Editors). *Progress in South American Camelids Research. Proceedings of the 3rd European Symposium and SUPREME European Seminar, Goettingen, Germany, 27-29 May 1999.* Wageningen Pers, Wageningen. 2001: 140-148. ISBN: 9074134912. Note: In English with a Spanish summary.

Descriptors: alpaca, diets, forage plant choices, feed preferences, feeding behavior, forage degradability, Chile.

Castrignano, F.; Antonini, M.; Misiti, S.; Cristofanelli, S.; Renieri, C. **SUPREME-Project: sequence of tyrosinase related protein-1 (TRP-1) in alpaca.** In: Martina Gerken; Carlo Renieri (Editors). *Progress in South American Camelids Research. Proceedings of the 3rd European Symposium and SUPREME European Seminar, Goettingen, Germany, 27-29 May 1999.* Wageningen Pers, Wageningen. 2001: 199-206. ISBN: 9074134912. Note: In English with a Spanish summary.

Descriptors: alpacas, nucleic acids, proteins, tyrosinase related protein 1, gene cloning and sequence analysis, molecular genetics.

Cebra, C.K.; Tornsquist, S.J.; Van Saun, R.J.; Smith, B.B. **Glucose tolerance testing in llamas and alpacas.** *American Journal of Veterinary Research.* May 2001; 62(5): 682-686. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, alpacas, glucose tolerance test, blood sugar, species differences, fatty acids, hydrocortisone, insulin ratios.

Celedon, M.; Sandoval, A.; Droguett, J.; Calfio, R.; Ascencio, L.; Pizarro, J.; Navarro, C. **Pesquisa de anticuerpos seroneutralizantes para pestivirus y herpesvirus en ovinos, caprinos y camelidos sudamericanos de Chile. [Survey for antibodies to pestivirus and herpesvirus in sheep, goats, alpacas (*Lama pacos*), llamas (*Lama glama*), guanacos (*Lama guanicoe*) and vicuna (*Vicugna vicugna*) from Chile.]** *Archivos de Medicina Veterinaria* (Valdivia). 2001; 33(2): 165-172. ISSN: 0301-732X. Note: In Spanish with an English summary.

NAL call no.: SF604.A75

Descriptors: alpacas, llamas, guanacos, vicunas, sheep, goats, incidence of viral diseases, herpes virus, pestivirus, antibody survey, disease, Chile.

Chen Xue Long; Zhang Wei; Jin Yu. **[The physical parameters of alpaca (*Lama pacos*) hair.]** *Journal of Northeast Forestry University* (Harbin, China). 2001; 29(6): 46-48. ISSN: 1000-5382. Note: In Chinese with an English summary.

Descriptors: alpacas, hair structure, description of various parameters, hair diameter, length, breaking strength, low medullary index, monotypic scale arrangement, can be used for textiles.

Christensen, J.M.; Limsakun, T.; Smith, B.B.; Hollingshead, N.; Huber, M. **Pharmacokinetics and pharmacodynamics of antiulcer agents in llama.** *Journal of Veterinary Pharmacology and Therapeutics.* Feb 2001;

24(1): 23-33. ISSN: 0140-7783.

NAL call no.: SF915.J63

Descriptors: llamas, gastrointestinal pharmaceutical agents, pharmacokinetics, drug half-life, pharmacodynamics, hydrochloric acid secretion, intravenous administration, oral administration, drug dosage, adverse effects, ranitidine, omeprazole, misoprostol.

Abstract: Plasma concentration time curves following intravenous (i.v.) administration of 1.5 mg/kg of ranitidine, 0.2 mg/kg, 0.4 mg/kg and 0.8 mg/kg of omeprazole, respectively, were analysed in six llamas. Plasma profiles after i.v. administration of both drugs showed plasma concentrations declining in a biexponential manner with a rapid distribution phase. Pharmacokinetics parameters after ranitidine administration to six llamas showed a mean elimination half-life of 1.53 +/- 0.26 h. The mean volume of distribution (V(dss)) in llamas was 1.77 +/- 0.31 L/kg, and mean body clearance in llamas was 0.778 +/- 0.109 L/kg/h. Ranitidine produced only a small transitory (<1 h) decline in acid production when administered i.v. at a dose of 1.5 mg/kg. Omeprazole showed dose-dependent nonlinear pharmacokinetics. The mean half-life of 0.2 mg/kg i.v. omeprazole was shorter than that of 0.4 and 0.8 mg/kg i.v. omeprazole, i.e. 0.61, 0.72 and 1.07 h, respectively. The area under the curve (AUC) and mean residence time (MRT) increased with increasing dose, while clearance decreased as dose increased. The decline in acid production following 0.2 mg/kg i.v. omeprazole was highly variable and did not produce a clinically useful suppression of third compartment acid production. In contrast, both 0.4 mg/kg and 0.8 mg/kg omeprazole i.v. administration significantly reduced third compartment acid production. The reduction in acid production following 0.8 mg/kg omeprazole was not significantly greater than the reduction observed following 0.4 mg/kg dosage. Misoprostol (10 micrograms/kg) was administered i.v. in an absolute alcohol solution. Two animals collapsed following drug administration. While the side-effects could have been produced by either misoprostol or the alcohol vehicle, the clinical changes were more consistent with an adverse drug reaction. Unfortunately, the limitation of UV detection did not provide the sensitivity needed to quantify the amount of misoprostol in llama plasma, and the pharmacokinetics could not be evaluated.

Curtis, C.F.; Chappell, S.J.; Last, R. **Concurrent sarcoptic and chorioptic acariosis in a British llama (*Lama glama*).** *Veterinary Record* (London). Aug 18, 2001; 149(7): 208-209. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, scabies, *Sarcoptes scabiei*, *O Chorioptes*, mange, concurrent infections, symptoms, diagnosis, treatment, case reports, United Kingdom.

Dugdale, A. **Anaesthesia of a pregnant alpaca (*Lama pacos*).** *Veterinary Record* (London). July 7, 2001; 149(1): 28. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: alpacas, pregnancy, anesthesia, anesthetics, case reports.

Galleguillos, M.; Valenzuela, M.A.; Riquelme, R.; Sanhueza, E.; Sanchez, G.; Figueroa, J.P.; Llanos, A.J. **Nitric oxide synthase activity in brain tissues from llama fetuses submitted to hypoxemia.** *Comparative Biochemistry and Physiology. Part A. Molecular and Integrative Physiology*. June 2001; 129A (2/3): 605-614. ISSN: 1095-6433.

NAL call no.: QP1.C6

Descriptors: llamas, chronic hypoxia, altitude, Andes highlands, NO, nitric oxide synthase, fetal response.

Abstract: The fetal llama (*Lama glama*; a species adapted to live in chronic hypoxia in the highlands of the Andes) did not increase cerebral blood flow and reduce the brain oxygen uptake during hypoxemia. Although nitric oxide (NO) is a normal mediator in the regulation of vascular tone and synaptic transmission, NO overproduction by hypoxemia could produce neuronal damage. We hypothesized that nitric oxide synthase (NOS) activity is either maintained or reduced in the central nervous system of the llama fetuses submitted to chronic hypoxemia. Approximately 85% of the Ca(2+)-dependent NOS activity was soluble, at least 12% was associated with the mitochondrial fraction, and less than 5% remains associated with microsomes. To understand the role of NO in chronic hypoxemia, we determined the effect of 24-h hypoxemia on NOS activity in the central nervous system. No changes in activity or the subcellular distribution of NOS activity in brain tissues after hypoxemia were found. We proposed that the lack of changes in NOS activity in the llama under hypoxemia could be a cytoprotective mechanism inherent to the llama, against possible toxic effects of NO.

Gazitua, F.J.; Corradini, P.; Ferrando, G.; Raggi, L.A.; Parraguez, V.H. **Prediction of gestational age by ultrasonic fetometry in llamas (*Lama glama*) and alpacas (*Lama pacos*).** *Animal Reproduction Science*. Apr 30, 2001; 66(1/2):

81-92. ISSN: 0378-4320.

NAL call no.: QP251.A5

Descriptors: llamas, alpacas, prediction, gestation period duration, fetal age prediction, diameter, height, pregnancy, developmental stages, fetometry, ultrasound.

George, J.W.; O'Neill, S.L. **Comparison of refractometer and biuret methods for total protein measurement in body cavity fluids.** *Veterinary Clinical Pathology*. 2001; 30(1): 16-18. ISSN: 0275-6382.

NAL call no.: SF601.A54

Descriptors: horses, cattle, dogs, llamas, cats, body fluids, refractometry, biuret, techniques evaluation, protein content, measurement, conversion tables, mathematical models, quantitative analysis.

Gilsdorf, M.J.; Thoen, C.O.; Temple, R.M.S.; Gidlewski, T.; Ewalt, D.; Martin, B.; Henneger, S.B. **Experimental exposure of llamas (*Lama glama*) to *Brucella abortus*: humoral antibody response.** *Veterinary Microbiology*. July 3, 2001; 81(1): 85-91. ISSN: 0378-1135.

NAL call no.: SF601.V44

Descriptors: llamas, *Brucella abortus*, immune response, experimental infections, humoral immunity, blood chemistry, ELISA, serology, antibodies, virulence, diagnostic techniques.

Abstract: Positive antibody reactions to brucella were observed in the sera of four llamas receiving *Brucella abortus* Strain 19 subcutaneously at 2-3 weeks post-exposure (PE) using five of eight conventional brucella serologic tests and an ISU-ELISA. Positive brucella antibody reactions were detected in sera of four llamas exposed by intraocular instillation (IOI) of 1.02×10^8 (high dose) *B. abortus* Strain 2308 at 16-35 days PE using seven of eight serologic tests or an ISU-ELISA. Brucella antibody was also detected in sera of four llamas exposed by IOI of 9×10^5 (low dose) *B. abortus* using each of four agglutination tests, Complement Fixation test, PCFIA, the rivanol test and the ISU-ELISA at 16-35 days PE. Positive reactions were observed using the Card test, BAPA, SPT, STT, the rivanol test, the PCFIA, and the ISU-ELISA on sera collected on days 42-70 PE, except on one llama, given the low dose; that llama was negative on the PCFIA on day 42. Positive or suspicious reactions were not detected in sera of controls, receiving saline subcutaneously, using the routine tests, with the exception of the CFT. The *B. abortus* Strain 2308 was isolated from tissues of seven of eight llamas exposed to virulent *B. abortus* Strain 2308.

Gonzalez Sch., F.; Islas L., A.; Lopez Rivero, J.L.; Quezada O., M.; Gonzalez H., H. **Histochemical and morphological characterization of Gluteus medius muscle fibres in guanaco (*Lama guanicoe*).** *Lucrai Stiinfice Medicina Veterinara, Universitatea de Stiinte Agricole si Medicina Veterinara "Ion Ionescu de la Brad" Iasi*. 2001; 44(3(1): 12-20. ISSN: 1454-7406. Note: In English with a Rummanian summary.

Descriptors: guanacos, skeletal muscle composition, fibrillar composition by NADH-TR test, oxidative capacity of fibers, Type I, IIA, IIB found, diameter, histochemistry, morphology, muscle fibers, muscles, skeletal muscle.

Healy, Kevin; Helen Kellogg Institute for International Studies. **Llamas, Weavings, and Organic Chocolate: Multicultural Grassroots Development in the Andes and Amazon of Bolivia.** University of Notre Dame Press, Notre Dame, Ind. c2001. xiv, 485 p., [16] p. of plates: ill., maps. Includes bibliographic references p. 447-471 and an index. ISBN: 0268013268.

NAL call no.: HN280.Z9.C644 2001

Descriptors: rural development projects, culture, social conditions, economic conditions, indigeneous peoples, Bolivia.

Heath, A.M.; Navarre, C.B.; Simpkins, A.; Purohit, R.C.; Pugh, D.G. **A comparison of surface and rectal temperatures between sheared and non-sheared alpacas (*Lama pacos*).** *Small Ruminant Research*. Jan 2001; 39(1): 19-3. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: alpacas, heat stress, summer, effects of whole body shearing, body temperature, environmental temperature, relative humidity, body temperature regulation, skin temperature, rectal temperatures, thermoregulation, Alabama.

Abstract: The objective of this research was to determine if whole-body shearing would effect gross thermoregulation in alpacas. Eight mature, intact male alpacas were randomly assigned to one of two groups and maintained in outdoor pastures with adequate artificial shade from June through August (summer climate) in east central Alabama, USA. Group one animals (N = 4) were sheared to remove all fiber to within 2 cm of their skin. Group 2 animals (N = 4) were

left non-sheared. Sheared alpacas tended to have lower rectal temperatures during high ambient temperatures than did non-sheared alpacas ($P = 0.06$). Thermographic studies of the scrotum revealed cooler surface temperatures in sheared versus non-sheared alpacas ($P = 0.05$). Temperatures in the right medial thigh of sheared animals were 0.9 degree C cooler than the thigh region of non-sheared animals in the morning ($P < 0.03$). Right medial thigh temperatures were 1.6 degrees C cooler in sheared alpacas in the afternoon ($P < 0.01$). Significant positive correlations were found in non-sheared animals between ambient temperature and rectal temperature in the morning ($r = 0.612$, $P = 0.014$). In sheared animals during the morning significant positive correlations were established between the Heat Stress Index (HSI) and the right medial thigh surface temperatures ($r = 0.648$, $P = 0.003$), the HSI and rectal temperature ($r = 0.729$, $P = 0.0003$), the ambient temperature and right medial thigh surface temperature ($r = 0.485$, $P = 0.04$), and the ambient temperature and the rectal temperature ($r = 0.823$, $P < 0.0001$). In the afternoon a significant positive correlation was found in the sheared alpacas between the HSI and the right medial thigh surface temperature, rectal temperature and surface scrotal temperature ($r = 0.538$, $P = 0.02$, $r = -0.543$, $P = -0.019$ and $r = 0.522$, $P = 0.045$), respectively. These data indicate that whole-body shearing of alpacas could have a beneficial effect on thermoregulation when used as a preventative measure against heat stress. Shearing may assist heat dissipation resulting in a cooler surface body temperature and rectal temperature in alpacas when challenged by the heat and humidity experienced in the summer months in the southeastern United States.

Hewson, J.; Cebra, C.K. **Peritonitis in a llama caused by *Streptococcus equi* subsp. *zooepidemicus*.** *Canadian Veterinary Journal*. June 2001; 42(6): 465-467.

NAL call no.: 41.8 R3224

Descriptors: llamas, *Streptococcus equi*, intestinal infections, testing, diagnosis, disease monitoring and control.

Irwin, J.A. **Lymphosarcoma in an alpaca.** *Canadian Veterinary Journal*. Oct 2001; 42(10): 805-806. Note: In English with a French summary. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: alpacas, lymphosarcoma, symptoms, histopathology, lesions, hematology, blood chemistry, case reports.

Ivany, J.M.; Anderson, D.E. **Propylene glycol toxicosis in a llama.** *Journal of the American Veterinary Medical Association*. Jan 15, 2001; 218(2): 243-244. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, propylene glycol poisoning, ketosis, microbial flora, case reports.

Kadwell, Miranda; Fernandez, Matilde; Stanley, Helen F.; Baldi, Ricardo; Wheeler, Jane C.; Rosadio, Raul; Bruford, Michael W. **Genetic analysis reveals the wild ancestors of the llama and the alpaca.** *Proceedings of the Royal Society Biological Sciences. Series B*. 2001 Dec; 268(1485): 2575-2584. ISSN: 0962-8452.

NAL call no.: 501 L84B

Descriptors: llamas, alpacas, taxonomy, evolution, phylogeny, genetic analysis, microsatellite DNA, mitochondrial DNA, genetic variation, wild ancestors, South America.

Koenig, J.B.; Watrous, B.J.; Kaneps, A.J.; Adams, J.G.; Parker, J.E. **Otitis media in a llama.** *Journal of the American Veterinary Medical Association*. May 15, 2001; 218(10): 1619-1623. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, otitis media, *Actinomyces pyogenes*, treatment, case report.

Kreil, V.; Luders, C.; Hallu, R.; Reuelto, M.; Betancourt, L. **Farmacocinetica de la ampicilina en alpacas (*Lama pacos*). [Pharmacokinetics of ampicillin in alpacas (*Lama pacos*)]** *Archivos de Medicina Veterinaria (Valdivia)*. 2001; 33(2): 241-246. ISSN: 0301-732X. Note: In Spanish with an English summary.

NAL call no.: SF604.A75

Descriptors: alpacas, antibiotics, ampicillin, pharmacokinetics, drug safety.

Laraway, W. **"It" happens! Selling llama manure.** *Small Farm Today*. Mar/Apr 2001; 18(2): 42-43. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, animal manures, marketing.

Leichner, T.L.; Turner, O.; Mason, G.L.; Barrington, G.M. **Cutaneous metastases of a mammary carcinoma in a llama.** *Canadian Veterinary Journal*. Mar 2001; 42(3): 204-206. ISSN: 0008-5286. Note: In English with a French summary.

NAL call no.: 41.8 R3224

Descriptors: llamas, mammary gland neoplasms, adenocarcinoma, metastasis, skin lesions, case reports.

Livingston, C.K.; Dart, A.J.; Dowling, B.A.; Dart, C.M.; Hodgson, D.R. **Surgical correction of carpal valgus deformity in three alpacas.** *Australian Veterinary Journal*. 2001 Dec; 79(12): 821-824. ISSN: 0005-0423.

NAL call no.: 41.8 AU72

Descriptors: alpacas, forelimb deformity, carpal valgus, surgical correction, case reports.

Lopez V., A.; Morales S., M.S.; Cabrera C., R.; Arias, M. **Ingestion y digestibilidad aparente de forrajes por la llama (*Lama glama*). II. Heno de trebol rosado (*Trifolium pratense*), heno de ballica (*Lolium multiflorum*), paja de poroto (*Phaseolus vulgaris*) y paja de avena (*Avena sativa*). [Intake and apparent digestibility of forages in llamas (*Lama glama*). II. Clover hay (*Trifolium pratense*), ryegrass hay (*Lolium multiflorum*), bean straw (*Phaseolus vulgaris*) and oat straw (*Avena sativa*).]** *Archivos de Medicina Veterinaria* (Valdivia). 2001; 33(2): 145-153. ISSN: 0301-732X. Note: In Spanish with an English summary.

NAL call no.: SF604.A75

Descriptors: llamas, intake and digestibility of forages, forage plant choices, clover hay, ryegrass hay, bean straw.

Marguet, E. **Yenneveldt llama farm.** *Small Farm Today*. July/Aug 2001; 18(4): 68. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, livestock farming.

Mattoon, J.S.; Gerros, T.C.; Brimacombe, M. **Thoracic radiographic appearance in the normal llama.** *Veterinary Radiology and Ultrasound*. Jan/Feb 2001; 42(1): 28-37. ISSN: 1058-8183.

NAL call no.: SF757.8.A4

Descriptors: llamas, thorax, radiography, animal anatomy, dimensions, height, width, spine, ratios, pulmonary artery, veins, trachea.

Murray, S.L.; Lau, K.W.; Begg, A.; Jacobs, K. **Myelodysplasia, hypophosphataemia, vitamin D, and iron deficiency in an alpaca.** *Australian Veterinary Journal*. May 2001; 79(5): 328-331. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, blood disorders, hypophosphatemia, vitamin D, vitamin deficiencies, iron deficiency, anemia, leukopenia, hypocalcemia, case reports.

Navarre, C.B.; Heath, A.M.; Wenzel, J.; Simpkins, A.; Blair, E.; Belknap, E.; Pugh, D.G. **A comparison of physical examination and clinicopathologic parameters between sheared and non-sheared alpacas (*Lama pacos*).** *Small Ruminant Research*. Jan 2001; 39(1): 11-17. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: alpacas, intact males, heat stress, shearing, summer, environmental temperatures, relative humidity, body temperature, body weight, body condition, thermoregulation, blood chemistry, blood serum. urea levels, electrolytes values, sodium, selenium, hydrocortisone, effects of shearing, Alabama.

Abstract: The purpose of this study was to determine the physiological changes associated with chronic heat stress in sheared versus non-sheared alpacas. Fourteen intact male adult alpacas were randomly assigned to one of the two groups: Group S alpacas were sheared to within 2 cm of their skin; Group NS alpacas were not sheared. These animals were maintained from June through August in east central Alabama. Data collected in the morning, every two weeks, included vital signs, body weight, body condition score, complete blood counts, serum chemistries and electrolytes, whole blood selenium, and plasma cortisol. S and NS groups were contrasted using the repeated measures analysis of variance, and pertinent correlations with weather parameters were calculated. Clinical heat stress was not evident in any animals during the study. Significant differences between treatment groups were seen in rectal temperature ($P = 0.0095$), sodium concentration ($P = 0.0219$), and blood urea nitrogen (BUN) ($P = 0.0189$). The mean rectal temperature of the NS group was above the normal range on five sampling times compared to only once for the S group. However, mean sodium and serum urea nitrogen levels were within normal limits in both groups at all sampling times. Rectal

temperature of only the S group was positively correlated to weather parameters. Sodium of both S and NS groups and BUN of the NS group were negatively correlated with weather parameters. This study indicates that there are differences between sheared and non-sheared alpacas in physical examination and clinicopathologic parameters that can be correlated with changes in ambient conditions. These differences suggest that non-sheared alpacas are less heat tolerant than sheared alpacas. Therefore, shearing is recommended for animals exposed to similar conditions.

Navarre, C.B.; Ravis, W.R.; Nagilla, R.; Simpkins, A.; Duran, S.H.; Pugh, D.G. **Pharmacokinetics of phenylbutazone in llamas following single intravenous and oral doses.** *Journal of Veterinary Pharmacology and Therapeutics*. June 2001; 24(3): 227-231. ISSN: 0140-7783.

NAL call no.: SF915.J63

Descriptors: llamas, phenylbutazone, pharmacokinetics, intravenous injection, oral administration.

Navarre, C.B.; Ravis, W.R.; Campbell, J.; Nagilla, R.; Duran, S.H.; Pugh, D.G. **Stereoselective pharmacokinetics of ketoprofen in llamas following intravenous administration.** *Journal of Veterinary Pharmacology and Therapeutics*. June 2001; 24(3): 223-226. ISSN: 0140-7783.

NAL call no.: SF915.J63

Descriptors: llamas, ketoprofen, intravenous injection, pharmacokinetics, isomers.

Pelliza, A.; Willems, P.; Manacorda, M. **Dietary structural types of polygastric herbivores at different environments and seasons.** *Journal of Range Management*. July 2001; 54(4): 330-337. ISSN: 0022-409X. Note: In English with a Spanish summary.

NAL call no.: 60.18 J82

Descriptors: cattle, sheep, goats, *Lama guanicoe*, seasonal variation, feeds, selective grazing, forage, feces composition, forage digestibility, vegetation, botanical composition, pastures, species differences, Argentina.

Abstract A classification of dietary structural types that represents different arrangements of forage classes is proposed. It may be especially useful for interpreting and comparing herbivore diets from different environments. As an example, a data set with the botanical composition of 55 pooled fecal samples determined by microhistological analysis was analyzed. These samples came from 4 species of range herbivores (cattle, sheep, goat, and guanaco -*Lama guanicoe* -), from 9 different environments of Northern Patagonia (Argentina) during 3 seasons. Based on plant characteristics related with the capacity of the animals to eat and digest each plant and with the occasional or permanent presence of them in the vegetation, the information was grouped into 5 forage classes: woody plants, perennial grasses, annual grasses, grasslikes, and forbs. A principal component analysis of the grouped data was conducted. The graphic representations evidenced the gradual changes in the structure of the data. Later, working over the subspace defined by the 3 first principal component axes, a hierarchical classification was performed that resulted in 9 dietary structural types. These types represented variation that resulted from the interaction of pasture differences, species of herbivore and season. This concept is an abstraction developed from the experience, to extend its utility beyond the particular cases.

Rulofson, F.C.; Atwill, E.R.; Holmberg, C.A. **Fecal shedding of *Giardia duodenalis*, *Cryptosporidium parvum*, *Salmonella* organisms, and *Escherichia coli* O157:H7 from llamas in California.** *American Journal of Veterinary Research*. Apr 2001; 62(4): 637-642. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, *Escherichia coli*, *Giardia duodenalis*, *Cryptosporidium parvum*, *Salmonella*, feces shedding, incidence, age differences, animal husbandry, risk factors, California.

Sarno, R.J.; Franklin, W.L.; O'Brien, S.J.; Johnson, W.E. **Assessing genetic differentiation between an island and mainland population of guanacos in southern Chile utilizing mtDNA and microsatellite markers.** *Animal Conservation*. 2001; 4(2): 93-101. ISSN: 1367-9430.

NAL call no.: QH75.A1 A54

Descriptors: guanacos, blood sampling, genetic assessment, genetic drift in inbreed populations, genetic diversity in mainland populations, mitochondrial DNA, comparison study, 15 microsatellite loci amplified, Terra del Fuego, Torres del Paine, Chile.

Saskatchewan. Agriculture Development Fund and the Saskatchewan Llama Association Wool Pool. **Phase II: Wool**

Pool Membership. Published by the Fund., [2001] [5] p. Note: "Agriculture Development Fund; Final report; 20000153." "Prepared by: Saskatchewan Llama Association Wool Pool."

NAL call no.: HD9430.C23S24 2001

Descriptors: camelids, llamas, fiber industry, Saskatchewan, Canada.

Skidmore, Julian A.; Billah, M.; Short, R.V.; Allen, W.R. **Assisted reproductive techniques for hybridization of camelids.** *Reproduction Fertility and Development.* 2001; 13(7-8): 647-652. ISSN: 1031-3613.

NAL call no.: QP251.R47

Descriptors: camelids, animal hybrids, hybridization techniques, assisted reproduction techniques.

Smith, B.B.; Van Saun, R.J. **Seasonal changes in serum calcium, phosphorus, and vitamin D concentrations in llamas and alpacas.** *American Journal of Veterinary Research.* Aug 2001; 62(8): 1187-1193. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, alpacas, seasonal variation, blood serum, calcium, phosphorus, cholecalciferol, age and sex differences.

Tornquist, S.J.; Cebra, C.K.; Van Saun, R.J.; Smith, B.B.; Mattoon, J.S. **Metabolic changes and induction of hepatic lipidosis during feed restriction in llamas.** *American Journal of Veterinary Research.* July 2001; 62(7): 1081-1087.

IS2001SN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, liver diseases, lipidosis, restricted feeding, clinical aspects, blood chemistry, liver, biopsy, lactation, weight losses, fat mobilization, bile acids, aspartate aminotransferase, l-iditol-dehydrogenase, gamma glutamyltransferase, insulin, hydrocortisone.

Wensvoort, J.; Kyle, D.J.; Orskov, E.R.; Bourke, D.A. **Biochemical adaptation of camelids during periods where feed is withheld.** *Rangifer.* 2001; 21(1): 45-48. ISSN: 0333-256X.

Descriptors: camelids, adaption to feed restriction, starvation, fasting metabolic mechanisms, dietary requirements.

2000

Aba, M.A.; Kindahl, H.; Forsberg, M.; Quiroga, M.; Auza, N. **Levels of progesterone and changes in prostaglandin F₂alpha release during luteolysis and early pregnancy in llamas and the effect of treatment with flunixin meglumine.** *Animal Reproduction Science.* Apr. 28, 2000; 59(1/2): 87-97. ISSN: 0378-4320.

NAL call no.: QP251.A5

Descriptors: llamas, progesterone, prostaglandins, luteolysis, pregnancy, flunixin, hormone secretion, blood chemistry, dosage, intravenous injection, metabolites, estradiol.

Anderson, David E. *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000] 348 p., ill. (some col.).

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, conference proceedings, Camelidae, diseases, surgery, reproduction.

Anderson, D.E. **Assessment of fetal well-being in the camelid.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 312-316.

NAL call no.: SF997.5.C3O35 2000

Descriptors: ultrasonography, fetal ECG, fetal cardiocography, fetal distress, diagnosis, prevention.

Anderson, D.E. **Camelid vaccination protocol.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 109-110.

NAL call no.: SF997.5.C3O35 2000

Descriptors: camelid, disease protection, vaccination, *Clostridium*, rabies, leptospira, equine rhinovirus and influenza,

E. coli, North America.

Anderson, D.E. **Common surgical procedures in camelids.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 90-100.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, common surgical procedures, castration, gastrointestinal surgery, anesthesia, cesarean section, tooth root abscess, angular limb deformities.

Anderson, D.E. **Diagnosis of infertility in camelids.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 302-306.

NAL call no.: SF997.5.C3O35 2000

Descriptors: camelids, body condition, sexual maturity, reproductive diseases, infertility, breeding management, effects of heat stress, breeding behavior.

Anderson, D.E. **Diagnostic tools in practice.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 321-324.

NAL call no.: SF997.5.C3O35 2000

Descriptors: gastrointestinal anatomy, laparoscopy, llamas, alpacas, physical examination, ultrasound, radiographs, fluid analysis.

Anderson, D.E.; Silveira, F. **Effects of percutaneous liver biopsy in alpacas and llamas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 120-127.

NAL call no.: SF997.5.C3O35 2000

Descriptors: alpacas, llamas, percutaneous liver biopsy, effects, serum biochemical analysis, diagnosis of liver disease, clinical trial.

Anderson, D.E. **Field anesthetic techniques for camelids.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 309-311.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, anesthetics, epidural, sedation, lidocaine, xylazine, butorphanol, ketamine, yohimbine, tolazoline, atapamezole.

Anderson, D.E. **Heat stress in llamas and alpacas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 343-347.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, clinical signs, 10 recommended prevention measures, North America.

Anderson D.E. **Hypothyroidism: What is it and does it exist in llamas and alpacas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 338-340.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, hypothyroidism, thyroid hormone levels, normal ranges of TT4, TT3.

Anderson, D.E.; Gerken, D. **Investigation of hepatotoxic effects of Fumonisin (Mycotoxin) ingestion in alpacas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 128-129.

NAL call no.: SF997.5.C3O35 2000

Descriptors: alpacas, liver diseases, biliary hyperplasia, Fumonisin, overstocking, nutrition imbalance, chronic stress, research needs, North America.

Anderson, D.E. **Liver disease, metabolism, and digestion in llamas and alpacas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 111-119.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, sheep, alpacas, metabolism, digestion, liver disease, anamnesis, etiology, Oregon, feeding, case study, lipidasis, diagnosis.

Anderson, D.E. **Management of dystocia in small ruminants including camelids.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 282-293.

NAL call no.: SF997.5.C3O35 2000

Descriptors: camelids, dystocia, surgical treatment, cesarean section, uterine torsion, birthing problems, post-operative care.

Anderson, D.E. **Periapical tooth root infections in South American camelids.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 87-89.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, facial swellings, diagnosis, treatment options, teeth roots, radiograph, tooth removal.

Anderson, D.E.; Silveira, F. **Prolactin study.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 280: ill.

NAL call no.: SF997.5.C3O35 2000

Descriptors: prolactin, llamas, 5 day treatment, graph, case study.

Anderson, D.E. **Rickets - What's that?** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 179-182.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, rickets, vitamin D crias, North America, research needs.

Anderson, D.E. **Trouble-shooting nutrition for camelids.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 325-328.

NAL call no.: SF997.5.C3O35 2000

Descriptors: camelids, local geography, feeding practices, nutritional status, pasture, water quality, social behavior, hay.

Aubry, P.; Swor, T.M.; Lohr, C.V.; Tibary, A.; Barrington, G.M. **Septic orchitis in an alpaca.** *Canadian Veterinary Journal.* Sept 2000; 41(9): 704-706. ISSN: 0008-5286. Note: Summary in French.

NAL call no.: 41.8 R3224

Descriptors: alpacas, orchitis, testes, *Streptococcus zooepidemicus*, sepsis, histopathology, case report.

Bank, M.S.; Franklin, W.L.; Sarno, R.J. **Assessing the effect of radiocollars on juvenile guanaco survival.** *Oecologia.* 2000; 124(2): 232-234. ISSN 0029-8549.

NAL call no.: QL750.O3

Descriptors: guanacos, young animals, radio collars tracking devices, behavior, monitoring of movement of animals, effects of device on survival, no adverse effects seen.

Beier, E. III.; Lehenbauer, T.W.; Sangiah, S. **Clinical efficacy of fenbendazole against gastrointestinal parasites in llamas.** *Small Ruminant Research.* Apr 2000; 36(1): 17-23. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: llamas, nematodirus, *Strongyloides*, *Trichuris*, *Capillaria*, nematode infections, helminth ova, feces

composition, fenbendazole, oral administration, efficacy.

Beier, E. III.; Lehenbauer, T.W.; Sangiah, S. **Oral pharmacokinetics of fenbendazole in llamas, South American Camelids.** *Small Ruminant Research.* Aug 2000; 37(3): 209-214. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: llamas, fenbendazole, pharmacokinetics, oral administration, blood plasma, absorption, drug excretion, species differences.

Belknap, E.B.; Collins, J.K.; Larsen, R.S.; Conrad, K.P. **Bovine viral diarrhea virus in New World camelids.** *Journal of Veterinary Diagnostic Investigation.* Nov 2000; 12(6): 568-570. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, bovine diarrhea virus, detection, herds, case report.

Belknap, E.B.; Larsen, R.S.; Navarre, C.; Heath, A.M.; Pugh, D.G. **Complications of recumbency in New World camelids.** *Compendium on Continuing Education for the Practicing Veterinarian.* Feb 2000; 22(2): s42-s47. ISSN: 0193-1903.

NAL call no.: SF601.C66

Descriptors: llamas, trauma, duration, ulcers, eyes, anorexia, rumen flora, blood picture, blood chemistry, metabolic disorders, respiration, therapy.

Belknap, E.B.; C.B. Navarre; D.G. Pugh; R.S. Larsen; C.K. Cebra. **Recumbent New World camelids: General diagnostics and types of recumbency.** *Compendium on Continuing Education for the Practicing Veterinarian.* Jan 2000; 22(1): 36-55. ISSN: 0193-1903.

NAL call no.: SF601.C66

Descriptors: llamas, alpacas, guanaco, *Lama guanicoe*, vicunas, symptoms, clinical examination, differential diagnosis, treatment, septicemia, congenital abnormalities, cardiac insufficiency, tick paralysis, gastrointestinal diseases.

Bennett, M.M. **Veterinary handling for llamas and alpacas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 183-190.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, training, restraint, containment, catch pens, handling, behavior, chutes, injections.

Bickers, R.J.; Templer, A.; Cebra, C.K.; Kaneps, A.J. **Diagnosis and treatment of torsion of the spiral colon in an alpaca.** *Journal of the American Veterinary Medical Association.* Feb 1, 2000; 216(3): 380-382. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: alpacas, colon, torsion, colic, diagnosis, treatment, case reports.

Bonacic, C.; Gimpel, J.; Bas, F. **Conservation and sustainable use of the guanaco (*Lama guanicoe*) in Chile.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 212-232.

NAL call no.: SF997.5.C3O35 2000

Descriptors: sustainable use, captive farming, guanaco hematology, C3 ulcers, Chile, Patagonia, wild animal population, conflicts with sheep herding.

Bonacic, C. **Sustainable use of the vicuna (*Vicugna vicugna*) in Chile.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 191-211.

NAL call no.: SF997.5.C3O35 2000

Descriptors: sustainable use for fiber, captive farming, puna, Aymaras, natural history, conservation and management, Chile.

Bravo, P.W. **Breeding soundness examination of the male lamoid.** *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 247-251.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, reproductive organs, breeding history, clinical evaluation of males for breeding.

Bravo, P.W.; Callo, M.; Garnica, J. **The effect of enzymes on semen viscosity in llamas and alpacas.** *Small Ruminant Research.* Sept 2000; 38(1): 91-95. Includes refs. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: llamas, alpacas, collagenase, plasmin, hyaluronidase, trypsin, semen characteristics, viscosity, spermatozoa, viability, motility, acrosomes.

Abstract: The effect of four enzymes: collagenase, fibrinolysin, hyalurodinase, and trypsin were recorded on the viscosity, motility, percent live spermatozoa and acrosome integrity of llama and alpaca semen. Semen samples were collected using a modified artificial vagina for each of the five llamas and five alpacas. A 25% solution of the of enzyme at a concentration of 1 mg/ml was added to the ejaculate. Analysis of variance was used to determine differences in eliminating viscosity and alterations in motility, percent live spermatozoa and the acrosomal integrity at 0 (time of semen collection), 2 and 5 min. In llama and alpaca semen, collagenase eliminated viscosity in 100 and 99% of the samples, respectively. Correspondingly, fibrinolysin in 89 and 59%; hyalurodinase in 88 and 36%; and trypsin in 55 and 68% of the samples ($p < 0.05$). In the llama sperm, motility decreased ($p < 0.05$) with the addition of fibrinolysin (28%), trypsin (13%), hyalurodinase (12%), and collagenase (4%). In alpaca semen, the enzymes used had no effect on sperm motility. Percent live spermatozoa variably decreased after the addition of fibrinolysin, hyalurodinase and trypsin. There was no significant difference in the acrosome integrity in llama and Alpaca males following the addition of the enzymes. Overall, collagenase had little or no influence in decreasing motility, percent live spermatozoa and acrosome integrity, whereas, it was effective in eliminating semen viscosity.

Bravo, P.W.; Mayta, M.M.; Ordonez, C.A. **Growth of the conceptus in alpacas.** *American Journal of Veterinary Research.* Dec 2000; 61(12): 1508-1511. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: alpacas, conceptus growth, ultrasonography, embryonic development, progesterone, blood serum, twinning.

Bravo, P.W. **The post-partum interval of the female lamoid.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 20 00.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 307-308.

NAL call no.: SF997.5.C3O35 2000

Descriptors: alpacas, llamas, uterine involution, resumption of ovarian activity, sexual receptivity, postpartum, reproductive cycle.

Bravo, P.W. **Induction of parturition in the female lamoid.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 273.

NAL call no.: SF997.5.C3O35 2000

Descriptors: alpacas, llamas, reproductive, management, PGF treatment.

Bravo, P.W. **Male lamoid semen evaluation.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 252-256.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, male reproductive tract, preputial trauma, testicular abnormalities, cryptorchidism, heat stress, artificial vagina, semen characteristics.

Bravo, P.W. **Pregnancy diagnosis of the female lamoid.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 268-272.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, sexual behavior, rectal palpitation, progesterone levels, ballotment, ultrasonography, laparoscopy, pregnancy diagnosis.

Brown, B.W. **A review on reproduction in South American camelids.** *Animal Reproduction Science*. Mar 15, 2000; 58(3/4): 169-195. ISSN: 0378-4320.

NAL call no.: QP251.A5

Descriptors: llamas, alpacas, vicunas, guanaco, sexual reproduction, mating behavior, physiology, endocrinology, embryo mortality, conception rate, histology, luteolysis, ovarian follicles, ovulation, corpus luteum, ova viability, libido, artificial in semination, semen quality, freezing, animal breeding, literature reviews.

Cebra, C.K. **Hyperglycemia, hyponatremia, and hyperosmolarity in 6 neonatal llamas and alpacas.** *Journal of the American Veterinary Medical Association*. Dec 1, 2000; 217(11): 1701-1704. Includes refs. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, newborn animals, hyperglycemia, hyponatremia, osmolarity, clinical aspects, diagnosis and treatment case report.

Cebra, C.K.; Heidel, J.R.; Cebra, M.L.; Tornquist, S.J.; Smith, B.B. **Pathogenesis of *Streptococcus zooepidemicus* infection after intratracheal inoculation in llamas.** *American Journal of Veterinary Research*. Dec 2000; 61(12): 1525-1529. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, *Streptococcus zooepidemicus*, bacteremia, pathogenesis, experimental infection, trachea, inoculum density, disease models, clinical aspects, lesions.

Coleby, Pat. ***Natural Goat & Alpaca Care***. 2nd ed. Landlinks Press, Collingwood, Vic. c2000. viii, 352 p., ill. ISBN: 0643065253.

NAL call no.: SF383.C65 2000

Descriptors: goats, alpaca, general care and management, diseases, nutrition.

Costarella, C.E.; Anderson, D.E. **Ileocecolic intussusception in a one month old female llama.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000*. Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 329-334.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llama, female cria, abdominal pain, case study.

Cousins, D.V.; Williams, S.N.; Hope, A.; Eamens, G.J. **DNA fingerprinting of Australian isolates of *Mycobacterium avium* subsp. *paratuberculosis* using IS900 RFLP.** *Australian Veterinary Journal*. Mar 2000; 78(3): 184-190. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: *Mycobacterium paratuberculosis*, DNA fingerprinting, restriction fragment length polymorphism, restriction endonucleases, genetic diversity, sheep, cattle, goats, alpacas, Rhinocerotidae.

Davis, W.C.; Heirman, L.R.; Hamilton, M.J.; Parish, S.M.; Barrington, G.M.; Loftis, A.; Rogers, M. **Flow cytometric analysis of an immunodeficiency disorder affecting juvenile llamas.** *Veterinary Immunology and Immunopathology*. Apr 19, 2000; 74(1/2): 103-120. ISSN: 0165-2427.

NAL call no.: SF757.2.V38

Descriptors: llamas, alpacas, flow cytometry, immunological deficiency, immune system, monoclonal antibodies, leukocytes, monocytes, immunoglobulins B lymphocytes, T lymphocytes, development.

Domina, F.; Venza, M.; di Pietro, S.; Caja, A.; de Majo, M.; Morgante, M. **Aspetti morfologici delle cellule ematiche di alpaca (*Lama pacos*) allevati allo stato semibrado. [Haematological patterns of semifree-ranging alpacas (*Lama pacos*).]** *Selezione Veterinaria*. 2000; (Supplemento): 1195-1200. ISSN: 0037-1521. Note: In Italian with an English summary.

Descriptors: alpacas, blood components, hemoglobin, cell types, cell ultrastructure, cell morphology, cell descriptions, basophils, eosinophils, erythrocytes, lymphocytes, monocytes, neutrophils, platelets.

Evans, C.N. **Domperidone field study.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000*. Ohio State University. College of Veterinary Medicine.

Columbus, Ohio. [2000]: 276-279.

NAL call no.: SF997.5.C3O35 2000

Descriptors: camelid, gestation, domperidone, drug effects, fescuetoxicosis, lactation.

Fowler, M.E. **Diagnostic methods for alpacas & llamas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 20-32. Includes a letter (p. 31-32) with a questionnaire requesting conferees fill out the incidence of certain diseases they may have encountered in these species.

NAL call no.: SF997.5.C3O35 2000

Descriptors: alpacas, llamas, diagnostic procedures, monoclonal antibodies, rabies, enterotoxins, *Clostridium perfringens*, polymerase chain reaction, antigen identification, DNA probes, serologic tests, tuberculosis, paratuberculosis, foot and mouth disease, vesicular stomatitis, rabies, brucellosis, other bacteria, ultrasonography, endoscopy, CT scans, blood typing, immunocompetency.

Fowler, M.E. **Hematology and biochemistry of South American Camelids.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 14-19.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, vicunas, blood, sera, chemical values, hemoglobin, erythrocytes, leucocytes, oxygen carrying capacity, serum chemistry, glucose, urea nitrogen, creatinine, calcium, phosphorus, albumin, globulin fibrinogen, comparative charts.

Fowler, M.E.; Frost, B. **Prevalence of selected diseases of llamas and alpacas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 38-46.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, cases diagnosed, zoonoses, 16 diseases, rabies, FMD, vesicular stomatitis, blue tongue, bovine virus, retinal degeneration, leptospirosis, TB, Johne's disease, brucellosis, caseous lymphadenitis.

Fowler, M.E. **Restraint and behavior of camels.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 143-153.

NAL call no.: SF997.5.C3O35 2000

Descriptors: camels, offensive/defensive behaviors, restraint, chemical restraint.

Frezzio, M.K.; Anderson, D.E. ***Parelaphostrongylus tenuis* (miningal work infection in camelids.)** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 155-161.

NAL call no.: SF997.5.C3O35 2000

Descriptors: conference proceedings, Camelidae, diseases, llamas, alpacas, life cycle, clinical disease, diagnoses, therapy, prognosis, prevention, meningeal brain worm.

Gionfriddo, J.R.; Davidson, H.; Asem, E.K.; Krohne, S.G. **Detection of lysozyme in llama, sheep, and cattle tears.** *American Journal of Veterinary Research.* Oct 2000; 61(10): 1294-1297. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, sheep, cattle, tears, lysozyme, species differences.

Gionfriddo, J.R.; Melgarejo, T.; Morrison, E.A.; Alinovi, C.A.; Asem, E.K.; Krohne, S.G. **Comparison of tear proteins of llamas and cattle.** *American Journal of Veterinary Research.* Oct 2000; 61(10): 1289-1293. ISSN: 0001-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, cattle, tears, protein analysis, pH, protein content, proteinases, species differences.

Glewski, T.; Cheville, N.F.; Rhyan, J.C.; Miller, L.D.; Gilsdorf, M.J. **Experimental *Brucella abortus* induced abortion in a llama: pathologic effects.** *Veterinary Pathology.* Jan 2000; 37(1): 77-82. ISSN: 0300-9858.

NAL call no.: 41.8 P27

Descriptors: llamas, *Brucella abortus*, experimental infection, brucellosis, abortion, pathology, fetus.

Hamir, A.N; Timm, K.I.; Smith, B.B. **Thrombosis of the splenic vein in llamas (*Lama glama*).** *Veterinary Record* (London). Feb 19, 2000; 146(8): 226-228. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, thrombosis, veins, spleen, age differences.

Heller, M.; Anderson, D.; Silveira, F. **Streptococcal peritonitis in a young dromedary camel.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 335-337.

NAL call no.: SF997.5.C3O35 2000

Descriptors: dromedary camels, case report, *Streptococcus zooepidemicus*.

Hendrix, D.V.H.; Bochsler, P.N.; Saladino, B.; Cawrse, M.A.; Thomas, J. **Malignant teratoid medulloepithelioma in a llama.** *Veterinary Pathology*. Nov 2000; 37(6): 680-683. ISSN: 0300-9858.

NAL call no.: 41.8 P27

Descriptors: llamas, neoplasms, eyes, clinical aspects, histopathology, case report, immunohistochemistry.

Holland, M.S.; Kennedy, F.A.; Holland, R.E. **Companion animals as reservoirs of eaeA+ *Escherichia coli*.** *Journal of Veterinary Diagnostic Investigation*. Jan 2000; 12(1): 78-80. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: puppies, kittens, kids, alpacas, iguana, miniature pigs, *Escherichia coli*, reservoir hosts, diarrhea.

Jakes, K.A. **Fiber research at the Ohio State University.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 62-72.

NAL call no.: SF997.5.C3O35 2000

Descriptors: alpacas, llamas, sheep fleece, wool fibers, quality, fiber industry development.

Jasper, C.; Jasper, J.; Holdmeyer, R. **River bluff alpacas: a division of Wildlife Farms, Inc.** *Small Farm Today*. Mar/Apr 2000; 17(2): 43-45. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: alpacas, family farms, Missouri.

Jianlin, H.; Mburu, D.; Ochieng, J.; Kaufmann, B.; Rege, J.E.O.; Hanotte, O. **Application of new world camelidae microsatellite primers for amplification of polymorphic loci in Old World camelids.** *Animal Genetics*. Dec 2000; 31(6): 404-406. Refs. ISSN: 0268-9146.

NAL call no.: QP98.A1A5

Descriptors: llamas, alpacas, dromedaries camels, microsatellites, genetic polymorphism. loci evaluation, biochemical techniques, DNA, polymerase chain reaction. nucleotide sequences, molecular sequence data.

Johnson, C.R.; Baird, A.N.; Baird, D.K.; Wenzel, J.G.W. **Long-bone fractures in llamas: six cases (1993-1998).** *Journal of the American Veterinary Medical Association*. Apr 15, 2000; 216(8): 1291-1293. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, bone fractures, tibia, radius, femur, humerus, clinical aspects, radiography, treatment, prognosis, fracture fixation, postoperative complications, age differences, case report.

Johnson, L. **Llama herd health.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [20 00]: 47-56.

NAL call no.: SF997.5.C3O35 2000

Descriptors: neonatal care, immunization options, nutrition, parasite control, model program, reproduction, various care procedures.

Johnson, L.W. **Clinical examination of llamas and alpacas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 1-19.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, body size/weight, wool quality, body confirmation, temperament, restraint, veterinary exam, physical exam, skin, face, rectal and oral exams, body fluid sampling.

Johnson, L.W. **EPE: What's it all about?** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 82-83.

NAL call no.: SF997.5.C3O35 2000

Descriptors: eperythrozoonosis, red blood cell rickettsial parasite, hemolytic anemia, diagnosis, treatment, oxytetracycline.

Kramsky, J.A.; Miller, D.S.; Hope, A.; Collins, M.T. **Modification of a bovine ELISA to detect camelid antibodies to *Mycobacterium paratuberculosis*.** *Veterinary Microbiology.* Dec 20, 2000; 77(3/4): 333-337. ISSN: 0378-1135. Note: In the special issue: *Paratuberculosis (Johne's Disease)* / edited by R. Chiodini. Paper presented at a colloquium held February 14-18, 1999, Melbourne, Australia.

NAL call no.: SF601.V44

Descriptors: alpacas, llamas, *Mycobacterium avium paratuberculosis*, detection methods, ELISA, diagnosis disease outbreaks, IgG, herds, assays.

Abstract: *Mycobacterium avium* subsp. *paratuberculosis* infection, or Johne's disease, reportedly has a low prevalence in South American camelid populations. Recently, however, single cases in the United States as well as an outbreak of the disease in Australian alpacas (*Lama pacos*) have been described. To provide a rapid and cost-effective method of diagnosing Johne's disease in this species, the bovine Parachek Johne's Absorbed EIA (CSL, Vic., Australia) was modified to create a camelid-specific serum antibody assay. An anti-llama IgG conjugated to horseradish peroxidase replaced the anti-bovine immunoglobulin. Checkerboard titration of principal reagents was performed using serum from nine tissue and/or fecal culture-positive camelids. Optimal dilutions of key components were determined in order to provide clear discrimination between positive and negative controls. Completion of a kinetic assay determined the optical density at which the enzyme-substrate reaction should be stopped. A herd of 100 camelids with no history of disease or exposure to *M. a. paratuberculosis*, a subset of which were tissue and/or fecal culture-negative, was tested to establish a cut-off value. Sample results were expressed as a percentage of the results for control sera by transforming optical density values to ELISA values (EV%). A preliminary EV% cut-off of 20 was established. Using this prototype assay, culture-positive animals showed significantly different antibody responses from culture-negative animals. These results indicate that this camelid-specific ELISA, once refined, may be a useful tool for screening camelid herds for *M. a. paratuberculosis* infection.

Leveille, R. **Tendon ultrasonography in llama/alpacas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 177-178.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llama, alpacas, anatomy, ultrasonography, procedures, linear-array, 7.5MHz transducer, tendon descriptions.

Levot, G. **Resistance and the control of lice on humans and production animal.** *International Journal of Parasitology.* Mar 2000; 30(3): 291-297. Includes refs. Note: Paper presented at the Annual Conference of the Australian Society for Parasitology held September 26-30, 1999, Yeppoon, Queensland, Australia.

NAL call no.: QH547.I55

Descriptors: man, cattle, sheep, poultry, goats, alpacas, *Bovicola ovis*, *Phthiraptera*, ectoparasitoses, pest resistance, insect control, insecticides, ectoparasiticides, insecticide resistance.

Abstract: *Phthiraptera* (lice) are specialised insects adapted to parasitise many warm-blooded vertebrates, including domestic animals and humans. Often, attempts by the host to alleviate the irritation created by lice, causes derangement of the hair/fur coat. Unless treated, this derangement may cause economic losses due to hide damage and/or downgrading of wool/hair/fur. In 1981, application of aqueous insecticide solutions (dipping) for the control of sheep

body lice (*Bovicola ovis*) was largely superseded by off-shears pyrethroid "pour-on" treatments. By 1985, several field failures with these products were found to be due to low-level (20x) insecticide resistance. In 1990, high-level (640x) resistance was diagnosed in a New South Wales population. However, despite 30+ years use, organophosphate-based products are still usually effective. Until recently, cattle lice caused little concern. Treatments were applied mainly for aesthetic reasons when cattle were to be presented for sale, and also to prevent damage to fences by rubbing cattle. However, the introduction of quality-management programmes have raised awareness of the economic losses due to hide damage associated with lice infestations. Emerging industries such as emu and alpaca farming have raised the pest status of other louse species, and necessitated insecticidal intervention. In humans, attempts to control head lice, *Pediculus humanus capitis*, infestations have repeatedly failed around the world.

Linden, R.H.J. van der; Geus, B. de; Frenken, L.G.J.; Peters, H.; Verrips, C.T. **Improved production and function of llama heavy chain antibody fragments by molecular evolution.** *Journal of Biotechnology*. July 14, 2000; 80(3): 261-270. ISSN: 0168-1656.

NAL call no.: QH442.J69

Descriptors: llamas, recombinant proteins, biochemical techniques, *Saccharomyces cerevisiae*, yeasts, recombinant antibodies, DNA shuffling.

Macher, R. **Llamas at the Grand National.** *Small Farm Today*. Mar/Apr 2000; 17(2): 46-48. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, alpacas, agricultural shows, competitions.

March, P.A. **Congenital deafness.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000*. Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 141-142.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, phenotypic characteristics, deafness, BAER headphone method, criar.

Mattoon, J.; Adams, J.G.; Brimacombe, M. **Echocardiography in normal llamas and alpacas: A preliminary study.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000*. Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 84-86.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, echocardiography, normal animal data.

Mattoon, J.S.; Gerros, T.C.; Brimacombe, M. **Thoracic radiographic appearance in the normal llama.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000*. Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 73-81.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llama, normal animals, radiography, descriptions of normal parameters, measurements data table.

McCauley, C.T.; Campbell, G.A.; Cummings, C.A.; Drost, W.T. **Ossifying fibroma in a llama.** *Journal of Veterinary Diagnostic Investigation*. Sept 2000; 12(5): 473-476. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, fibroma, skull, nose, asphyxia, clinical aspects, diagnosis, case report.

Meadows, L.E.; Knowlton, F.F. **Efficacy of guard llamas to reduce canine predation on domestic sheep.** *Wildlife Society Bulletin*. Fall 2000; 28(3): 614-622. ISSN: 0091-7648.

NAL call no.: SK357.A1W5

Descriptors: llamas, sheep, coyotes predation, predator control, guard animals, Utah.

Miller, D.S.; Collins, M.T.; Smith, B.B.; Anderson, P.R.; Kramsky, J.; Wilder, G.; Hope, A. **Specificity of four serologic assays for *Mycobacterium avium* ss *paratuberculosis* in llamas and alpacas: a single herd study.** *Journal of Veterinary Diagnostic Investigation*. July 2000; 12(4): 345-353. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, alpacas, *Mycobacterium paratuberculosis*, serology, ELISA, antibody testing, immunodiffusion tests, diagnostic value, diagnostic test accuracy.

Monahan, C. ***Parelaphostrongylus tenuis* in the Ohio River Valley and parasitology in llamas and alpacas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 154.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, *Parelaphostrongylus tenuis*, parasitic nematode, diagnostic tests, fecal samples, sugar centrifugation, albendazoles.

Nuhsbaum, M.T.; Gionfriddo, J.R.; Powell, C.C.; Aubin, M.L. **Intraocular pressure in normal llamas (*Lama glama*) and alpacas (*Lama pacos*).** *Veterinary Ophthalmology.* 2000; 3(1): 31-34. Includes refs. ISSN: 1463-5216.

URL: www.blackwell-science.com/products/journals/jnltitle.htm

NAL call no.: SF891.V47

Descriptors: llamas, alpacas, eyes, pressure, measurement, species differences, age differences, spatial variation, age groups, statistical analysis.

Orlandi, C. **Ovarian physiology.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 263-267.

NAL call no.: SF997.5.C3O35 2000

Descriptors: anatomy, ovulation, follicular dynamics, pregnancy, hormones.

Orlandi, C. **Sperm viability.** Ohio State University. College of Veterinary Medicine. In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 257-262.

NAL call no.: SF997.5.C3O35 2000

Descriptors: fertility, semen quality and characteristics, artificial collection techniques, electroejaculation, artificial vagina.

Paschke, J. **Llama raising.** *Small Farm Today.* Mar/Apr 2000; 17(2): 52-53. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, animal husbandry.

Pearson, E.G.; Snyder, S.P. **Pancreatic necrosis in New World camelids: 11 cases (1990-1998).** *Journal of the American Veterinary Medical Association.* July 15, 2000; 217(2): 241-244. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, pancreatic diseases, necrosis, clinical aspects, pathology, postmortem examinations, amylases, triacylglycerol lipase, enzyme activity, case reports.

Perez, P.; Maino, M.; Guzman, R.; Vaquero, A.; Kobrich, C.; Pokniak, J. **Carcass characteristics of llamas (*Lama glama*) reared in Central Chile.** *Small Ruminant Research.* July 2000; 37 (1/2): 93-97. Includes refs. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: llamas, carcass composition and quality, body composition, sex differences, liveweight, carcass weight, dressing percentage, body fat thickness, moisture content, protein content, extracts, ash, Chile.

Abstract: Body and carcass composition were studied on 10 male and 10 female naturally reared llamas (*Lama glama*). Half the animals were young (9-12 months) and the other half adult (>3 year). The average live weights for young and adult males were 104.4 and 100.6 kg, and for females 67.6 and 104.6 kg, respectively. Average carcass weights for the four groups were 58.9, 56.2, 36.8 and 56.7 kg, respectively. Carcass composition for males and females was similar, but males had slightly higher dressing percentages than females (56.1 and 55.8 vs. 54.1 and 54.2 for young and adult males and females respectively). Carcass length and fat depth at the loin and proportions of cuts in the carcass were similar for both the sexes, except for leg and tail, which were proportionately heavier in young females compared to the other groups. The composition of meat on fresh basis was: moisture 70.2% protein 20.5%, ether extract 8.23% and ash 3.4%. Age and sex seemed to have no effects on the body and carcass characteristics studied nor on the chemical composition of meat.

Pugh, D.G.; Navarre, C.B. **Herd health programs for llamas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 57-61.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, vaccination, parasites, dentistry, feet, reproduction, meningeal worm infection, ivermectin, clorsulon, dormamectin, North America.

Pugh, D.G. **Reproductive evaluation of the male llama.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 235-246.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, internal secondary sex glands, neutering, castrations, scrotum, testicles, epididymis, semen collection and quality.

Purdy, S.R. **The alpaca eye study.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 165-176.

NAL call no.: SF997.5.C3O35 2000

Descriptors: alpaca, eye anatomy, globe, eyelids, cornea, conjunctiva, third eyelid, sclera, pupil, iris and pupillary ruff, lens, aqueous and vitreous humor, and ocular fundus.

Purdy, S.R. **Diagnosis and treatment of uterine infections in alpacas: A study in progress.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 294-297.

NAL call no.: SF997.5.C3O35 2000

Descriptors: alpacas, *E. coli*, uterine infections, infertility, breeding practices, North America, research.

Purdy, S.R. **Uterine infections in alpacas and llamas: Diagnosis and treatment.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 298-301.

NAL call no.: SF997.5.C3O35 2000

Descriptors: alpacas, llamas, uterine infections, diagnosis, treatment, indwelling uterine infuser, prevention, breeding practices.

Read, M.R.; Duke, T.; Toews, A.R. **Suspected tolazoline toxicosis in a llama.** *Journal of the American Veterinary Medical Association.* Jan 15, 2000; 216(2): 227-229. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, narcotic antagonists, poisoning, intravenous injection, clinical aspects, xylazine, case reports.

Reigh, C. **So you want a buy a llama.** *Small Farm Today.* Mar/Apr 2000; 17(2): 49-51. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, purchasing, assessing a healthy animal.

Reigh, C. **What you need to know about owning llamas.** *Small Farm Today.* July/Aug 2000; 17(4): 32-33. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, animal husbandry, anecdotal information, care, handling.

Renaudeau d'Arc, N.; Cassini, M.H.; Vila, B.L. **Habitat use by vicunas *Vicugna vicugna* in the Laguna Blanca Reserve (Catamarca, Argentina).** *Journal of Arid Environments.* Oct 2000; 46(2): 107-115. ISSN: 0140-1963.

NAL call no.: QH541.5.D4J6

Descriptors: vicunas, grazing, feeding preferences, vegetation, Stipa, habitats, quantitative analysis, diurnal variation. semiarid zones, *Acantholippia hastulata*, *Fabiana densa*, *Baccharis bolivianensis*, *Adesmia horridiuscula*, Argentina.

Sackstедера, M.; Lehmkuhl, L.B., Anderson, D.E.; Mattoon, J.S.; Meurs, K.M.; Bonagura, J.D. **Retrospective analysis**

of cardiac disease in camelids. In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 130-138.

NAL call no.: SF997.5.C3O35 2000

Descriptors: camelids, heart diseases, mitral regurgitation, pulmonary hypertension, dilated cardiomyopathy, pericardial effusion, heart failure, case histories, North America.

Saltet, J.; Dart, A.J.; Dart, C.M.; Hodgson, D.R. **Ventral midline caesarean section for dystocia secondary to failure to dilate the cervix in three alpacas.** *Australian Veterinary Journal.* May 2000; 78(5): 326-328. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, caesarean section, dystocia, cervix, placental retention, uterine prolapse, case report.

Sarno, R.J.; David, V.A.; Franklin, W.L.; O'Brien, S.J.; Johnson, W.E. **Development of microsatellite markers in the guanaco, *Lama guanicoe*: utility for South American camelids.** *Molecular Ecology.* 2000; 9: 1922-1924.

NAL call no.: QH540.M64

Descriptors: guanacos, camelids, genetic markers, microsatellite markers, potential for assessing genetic diversity, natural resource management.

Sarno, R.J., Franklin, W.L.; O'Brien, S.J.; Johnson, W.E. **Using genetic markers for the conservation of the wild South American camelids.** In: B.P. González; F.M. Bas; C.G. Tala; A.W. Iriarte (Editors). *Manejo sustentable de la vicuña y el guanaco: Actas del Seminario Internacional.* [Sustainable Management of the Vicuna and Guanaco: Proceedings of an International Seminar.] Servicio Agrícola y Ganadero. Santiago. 2000: 47-54.

Descriptors: camelids, guanacos, vicunas, wild animal conservation, genetic markers, genetic diversity monitoring techniques, populations, natural resource management, South America.

Sharpe, M.; Wittum, T. **An epidemiologic investigation of morbidity and mortality in llama and alpaca crias in Ohio.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 281.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, morbidity and mortality patterns, data from birth to weaning, 2 farms, Ohio.

Smith, B.B.; Timm, K.I.; Reed, P.J.; Christensen, M. **Use of cloprostenol as an abortifacient in the llama (*Lama glama*).** *Theriogenology.* Aug 2000; 54(3): 497-505. Includes refs. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, cloprostenol, intramuscular injection, drug effects, induced abortion, adverse effects, gestation period, blood plasma, progesterone, pharmacokinetics, half-life.

Timm, K.I.; Hamir, A.N.; Mattoon, J.S.; Smith, B.B. **The geriatric llama: A baseline study.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000.* Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 33-37.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, baseline data, geriatric animals, 36 animals, blood values, necropsy findings, complete blood count, chemistry panel, serum vitamin D, T3 & T4, sodium pentobarbital, euthanasia.

Tornquist, S.J.; Dodson, L.; Lanning, D.V. **Effect of temperature, storage time, and sample type on sorbitol dehydrogenase activity in llama serum and plasma.** *Veterinary Clinical Pathology.* 2000; 29(1): 16-18. ISSN: 0275-6382.

NAL call no.: SF601.A54

Descriptors: llamas, blood serum, blood plasma, blood sampling, sample processing, storage, enzyme activity, diagnostic techniques, liditol dehydrogenase, temperature effects.

Uzal, F.A.; Assis, R.A.; Chang Reissig, E. **Malignant oedema in a guanaco (*Lama guanicoe*).** *Veterinary Record* (London). Sept 16, 2000; 147(12): 336. Includes refs. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: *Lama guanicoe*, guanaco, edema, *Clostridium septicum*, *Clostridium novyi*, susceptibility, case report, Argentina.

Van Saun, R.J.; Callihan, B.R.; Tornquist, S.J. **Nutritional support for treatment of hepatic lipidosis in a llama.** *Journal of the American Veterinary Medical Association*. Nov 15, 2000; 217 (10): 1531-1535. Includes refs. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, lipidosis, liver, liver diseases, treatment, nutritional support, aminoacids, blood chemistry, hematology, case report.

Vaughan, J.L.; Lonsdale, R.A.; Jackson, G.; Ryan, D.P. **Congenital caudal vertebral malformations in the alpaca (*Lama pacos*).** *Australian Veterinary Journal*. June 2000; 78(6): 412-415. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, congenital abnormalities, progeny, tail malformations, inheritance, case reports.

Weaver, D.M.; Tyler, J.W.; Marion, R.S.; Wallace, L.M.; Nagy, J.K.; Holle, J.M. **Evaluation of assays for determination of passive transfer status in neonatal llamas and alpacas.** *Journal of the American Veterinary Medical Association*. Feb 15, 2000; 216(4): 559-563. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, newborn animals, passive immunity, IgG, immunodiffusion tests, gamma glutamyltransferase, blood proteins, serum albumin, globulins, sodium sulfite, turbidity.

Weaver, D.M.; Tyler, J.W.; Scott, M.A.; Wallace, L.M.; Marion, R.S.; Holle, J.M. **Passive transfer of colostral immunoglobulin G in neonatal llamas and alpacas.** *American Journal of Veterinary Research*. July 2000; 61(7): 738-741. Includes refs. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, alpacas, newborn animals, IgG, colostral immunity, failure, half-life, hypogammaglobulinemia, species differences, Missouri.

Wentz, P.A.; Belknap, E.B.; Pugh, D.G. **Bovine viral diarrhea virus in llamas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000*. Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 139-140.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, BDV, bovine viral diarrhea, alahamatherol, Flaviviridae, Pestivirus, experimental infection.

Willis, A.M.; Anderson, D.E.; Gemensky, A.J.; Wilkie, D.A.; Silveira, F. **Evaluation of intraocular pressure in eyes of clinically normal llamas and alpacas.** *American Journal of Veterinary Research*. Dec 2000; 61(12): 1542-1544. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, alpacas, eyes, internal pressure, normal values, measurement estimation, age and sex differences, diurnal variation, species differences.

Willis, A.M.; Anderson, D.E.; Gemensky, A.J.; Silveira, F. **Evaluation of intraocular pressure in normal eyes of llamas and alpacas.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000*. Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 164.

NAL call no.: SF997.5.C3O35 2000

Descriptors: llamas, alpacas, camelids, intraocular pressure, measurements, tonometry, eye disease.

Wilson, Tim; Wilson, Kelly. **The things we do for love.** In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000*. Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 348.

NAL call no.: SF997.5.C3O35 2000

Descriptors: prosthetic leg, alpaca, camelid.

Wisner, E.R. **CT/MRI**. In: *The Ohio State University College of Veterinary Medicine Presents Camelid Medicine, Surgery and Reproduction, March 22-25, 2000*. Ohio State University. College of Veterinary Medicine. Columbus, Ohio. [2000]: 101-105.

NAL call no.: SF997.5.C3O35 2000

Descriptors: camelids, computed tomography, nuclear magnetic resonance imaging, contrasts, hemorrhage, intracranial mass lesions, edema, black and white images.

Wuliji, T.; Davis, G.H.; Dodds, K.G.; Turner, P.R.; Andrews, R.N.; Bruce, G.D. **Production performance, repeatability and heritability estimates for live weight, fleece weight and fiber characteristics of alpacas in New Zealand**. *Small Ruminant Research*. Aug 2000; 37(3): 189-201. Includes refs. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: alpacas, body weight, fleece weight, staple, fiber quality of body regions, breaking strength, resistance, seasonal variation, sex differences, color.

1999

Aba, M.A.; Quiroga, M.A.; Auza, N.; Forsberg, M.; Kindahl, H. **Control of ovarian activity in llamas (*Lama glama*) with medroxyprogesterone acetate**. *Reproduction in Domestic Animals*. Dec 1999; 34(6): 471-476. ISSN: 0936-6768.

NAL call no.: SF105.A1Z8

Descriptors: llamas, ovaries, medroxyprogesterone, ovarian development, ovarian follicles, estrous cycle, synchronized females, blood chemistry, blood plasma, estradiol, progesterone, corpus luteum, mating, life expectancy, prostaglandins, hydrocortisone, LH.

Anderson, D.E.; Grubb, T.; Silveira, F. **The effect of short duration transportation on serum cortisol response in alpacas (*Lama pacos*)**. *Veterinary Journal* (London). Mar 1999; 157(2): 189-191. ISSN: 1090-0233.

NAL call no.: SF601.V484

Descriptors: alpacas, transporting animals. stress, blood chemistry, hydrocortisone, duration, time, heart rate, animal behavior.

Abstract: This research project evaluated the changes in serum cortisol in six male and six female alpacas in response to transportation of short duration. All alpacas were subjected to trailer transportation for 30 min. Serum samples were obtained prior to transportation, immediately after transportation, and after a 4-h recovery period. Heart rate was recorded at each time interval and observations of individual behavioural characteristics were recorded. Data were analysed using analysis of variance. Heart rate was not significantly changed by transportation stress. Serum cortisol concentration was significantly higher after transportation, but had returned to baseline concentration after the 4-h recovery period. Behavioural characteristics were not associated with changes in serum cortisol concentration.

Anderson, D.E.; Silveira, F. **Effects of percutaneous liver biopsy in alpacas and llamas**. *American Journal of Veterinary Research*. Nov 1999; 60(11): 1423-1425. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: alpacas, llamas, liver biopsy, blood proteins, adverse effects, l-iditol-dehydrogenase.

Baer, L. von; Hellemann, C. **Cryopreservation of llama (*Lama glama*) semen**. *Reproduction in Domestic Animals*. May 1999; 34(2): 95-96. ISSN: 0936-6768.

NAL call no.: SF105.A1Z8

Descriptors: llamas, semen, cryopreservation, surfactants, freezing, spermatozoa, motility, evaluation, fertility, thawing, semen diluents, semen preservation, fecundity.

Bank, M.S.; Lawrence, R.K.; Franklin, W.L.; Ortega, I.M. **Importance of wetland habitats to people and wildlife in the grazing agroecosystem of southern Chile**. *Vida Silvestre Neotropical*. 1999; 7(1): 43-45.

Descriptors: wildlife, humans, wetland habitats, value in agroecosystems, natural resources, resource management, Chile.

Barlow, A.M.; Mitchell, K.A.; Visram, K.H. **Bovine tuberculosis in llama (*Lama glama*) in the UK**. *Veterinary*

Record (London). Nov 27, 1999; 145(22): 639-640. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, *Mycobacterium bovis*, tuberculosis, diagnosis, isolation, susceptibility, United Kingdom.

Brunschwig, G. **Conduite des petits ruminants dans les cordilleres latino-americaïnes: comparaison des Andes centrales du Perou et de l'Altiplano du Guatemala.** [Performance of small ruminants in Latin American mountains: comparison of the central Andes in Peru and the Altiplano in Guatemala.] In: *Livestock Farming Systems: Integrating Animal Science Advances into the Search for Sustainability. Proceedings of the Fifth International Symposium on Livestock Farming Systems, Posieux, Fribourg, Switzerland, 19-20 August, 1999.* 2000: 160-163. ISBN: 9074134793. Note: In French with an English summary.

Descriptors: alpacas, llamas, goats, sheep, compared typology, animal breeding systems, meat production, wool production, influence of natural environments on management and rearing, Guatemala, puna of Peru.

Cafrune, M.M.; Aguirre, D.H.; Rickard, L.G. **Recovery of *Trichuris tenuis* chandler, 1930, from camelids (*Lama glama* and *Vicugna vicugna*) in Argentina.** *Journal of Parasitology.* Oct 1999; 85(5): 961-962. ISSN: 0022-3395.

NAL call no.: 448.8 J824

Descriptors: llamas, vicunas, *Trichuris*, animal parasitic nematodes, trichuriasis, disease prevalence, seasonal variation, feces, helminth ova, new geographic records, new host records, fecal egg count, Argentina.

Cardwell, J.M.; Thorne, M.H. **Hydronephrosis and ureteral duplication in a young alpaca.** *Veterinary Record* (London). July 24, 1999; 145(4): 104-107. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: alpacas, kidney diseases, ureter, congenital abnormalities, duplication, case reports, histopathology.

Cashman, T.; Dart, A.J.; O'Shea, A.; Hodgson, D.R. **Management of bilateral flexural deformity of the metacarpophalangeal joints in three alpaca crias.** *Australian Veterinary Journal.* Aug 1999; 77(8): 508-510. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, newborn animals, joints deformities, congenital abnormalities, treatment, surgery, complications, case report, conservative treatment.

Costarella, C.E.; Anderson, D.E. **Ileocecolic intussusception in a one-month-old llama.** *Journal of the American Veterinary Medical Association.* June 1, 1999; 214(11): 1672-1673. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, intussusception, young animals, diagnosis, treatment, resection, case report, anastomosis.

Drew, M.L.; Meyers-Wallen, V.N.; Acland, G.M.; Guyer, C.L.; Steinheimer, D.N. **Presumptive Sry-negative XX sex reversal in a llama with multiple congenital anomalies.** *Journal of the American Veterinary Medical Association.* Oct 15, 1999; 215(8): 1134-1139. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, congenital female genitalia abnormalities, sex reversal, genes, case report.

Duff, J.P.; Maxwell, A.J.; Claxton, J.R. **Chronic and fatal fascioliasis in llamas in the U.K.** *Veterinary Record* (London). Sept 11, 1999; 145(11): 315-316. Includes refs. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, *Fasciola hepatica*, fascioliasis, chronic and fatal infections, disease control, cattle, sheep, United Kingdom.

Franklin, W.L.; Johnson, W.E.; Iriarte, J.A.; Sarno, R.J. **Ecology of the Patagonian mountain lion, *Felis concolor patagonica*, in southern Chile.** *Biological Ecology.* 1999; 10: 41-47.

Descriptors: puma, *Felis concolor patagonica*, wild animals, natural ecology, preferred prey species, natural history, predators of guanacos, predator/prey relationships, Chile.

Fraser, M.D. **A comparison of the diet composition of guanacos (*Lama guanicoe*) and sheep when grazing swards with different clover: grass ratios.** *Small Ruminant Research.* May 1999; 32(3): 231-241. Includes refs. ISSN: 0921-

4488.

NAL call no.: SF380.I52

Descriptors: *Lama guanicoe*, sown grasslands, sheep, mixed grazing, mixed pastures, *Lolium perenne*, *Trifolium repens*, selective grazing, plant height, biomass, organic matter, fiber content, crude protein, leaves, stems, flowers, diets, botanical composition, United Kingdom.

Abstract: An experiment was conducted to compare the diet composition of guanacos and sheep when grazing grass/clover swards containing different amounts of clover. Experimental plots were prepared with clover: grass ratios of 40:60 (Low), 60:40 (Medium) and 80:20 (High). Two separate grazing trials were then conducted with these plots at two different sward heights. 20 cm (Tall) and 10 cm (Short). Sward composition and herbage biomass were determined for each plot using quadrat cuts, and the sward surface of each plot was characterised using a vertical point quadrat. Diet samples were collected using five animals of each species fistulated at the oesophagus. The sheep diet contained significantly more clover than the guanaco diet when the animals grazed the Medium plot of the Tall trial (31% versus 10%, $P < 0.05$) and the Low plot of the Short trial (56% versus 25%, $P < 0.05$). Statistically significant differences in the amounts of green grass leaf, dead grass leaf, grass vegetative stem, dead clover leaf and clover petiole in diets consumed by the two animal species were also recorded during the experiment. The sward composition and diet composition results obtained were used to calculate selectivity indices for individual dietary components. Both species strongly selected green grass leaf. In contrast, there was no consistent pattern to the selectivity indices for green clover leaf, although the response of the guanacos to this component was generally more negative than that of the sheep. The results of this study suggest that grazing by guanacos has the potential to improve the nutritive value of grass/clover swards for sheep, particularly if the sward being grazed initially contains more grass than clover.

Gerros, T.C.; Andreasen, C.B. **Analysis of transtracheal aspirates and pleural fluid from clinically healthy llamas (*Lama glama*).** *Veterinary Clinical Pathology*. 1999; 28(1): 29-32. ISSN: 0275-6382.

NAL call no.: SF601.A54

Descriptors: llamas, trachea, pleura, body fluids, blood cells, radiography, thorax, fibrinogen, cytology, macrophages, vacuoles, lymphocytes, neutrophils, eosinophils, epithelium, bacteria, specific gravity, glucose, lactic acid, chemical composition, protein content, refractive index.

Gilbert, J. **The lowdown on llamas.** *Small Farm Today*. Feb/Mar 1999; 16(1): 21-23. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, thoughts on managing this alternative livestock species.

Gorman, T.; Arancibia, J.P.; Lorca, M.; Hird, D.; Alcaino, H. **Seroprevalence of *Toxoplasma gondii* infection in sheep and alpacas (*Lama pacos*) in Chile.** *Preventive Veterinary Medicine*. June 11, 1999; 40(3/4): 143-149. ISSN: 0167-5877.

NAL call no.: SF601.P7

Descriptors: sheep, alpacas, *Toxoplasma gondii*, infections, seroprevalence, antibodies, serological surveys, diagnosis, geographical variation, sex differences, immunodiagnosis, Chile.

Hamor, R.E.; Severin, G.A.; Roberts, S.M. **Intraocular melanoma in an alpaca.** *Veterinary Ophthalmology*. 1999; 2(3): 193-196. ISSN: 1463-5216.

NAL call no.: SF891.V47

Descriptors: alpacas, melanoma, eye diseases, eyes, case report, symptoms, biochemical markers, clinical aspects, new host records, immunological deficiency, morphology, histology.

Hinrichs, K.; Buoen, L.C.; Ruth, G.R. **XX/XY chimerism and freemartinism in a female llama co-twin to a male.** *Journal of the American Veterinary Medical Association*. Oct 15, 1999; 215(8): 1140-1141. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, freemartinism, chimerism, blood cells, twins, female animal genitalia, case report.

Holmes, L.A.; Frame, N.W.; Frame, R.K.; Duff, J.P.; Lewis, G.C. **Suspected tremorgenic mycotoxicosis (ryegrass staggers) in alpacas (*Lama pacos*) in the UK.** *Veterinary Record* (London). Oct. 16, 1999; 145(16): 462-463. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: alpacas, ryegrass staggers, mycotoxicoses, endophytes, toxins, dry conditions, outbreaks, United Kingdom.

Jarvinen, J.A.; Dubey, J.P.; Althouse, G.C. **Clinical and serologic evaluation of two llamas (*Lama glama*) infected with *Toxoplasma gondii* during gestation.** *Journal of Parasitology*. Feb 1999; 85(1): 142-144. ISSN: 0022-3395.

NAL call no.: 448.8 J824

Descriptors: llamas, *Toxoplasma gondii*, toxoplasmosis, experimental infections, pregnancy, transplacental transmission, transmammary transmission, clinical aspects, seroprevalence, antibodies, blood serum, colostrum.

Jarvinen, J.A. **Prevalence of *Eimeria macusaniensis* (Apicomplexa: Eimeriidae) in midwestern *Lama* spp.** *Journal of Parasitology*. Apr 1999; 85(2): 373-376. ISSN: 0022-3395.

NAL call no.: 448.8 J824

Descriptors: llamas, alpacas, guanacos, *Eimeria*, coccidiosis, disease prevalence, feces, oocysts, species differences, age differences, North Central states of the United States.

Judson, G.J.; Feakes, A. **Vitamin D doses for alpacas (*Lama pacos*).** *Australian Veterinary Journal*. May 1999; 77(5): 310-315. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: South Australia, alpacas, cholecalciferol, vitamin supplements, dosage, vitamin D, 25,26-dihydroxycholecalciferol, nutritional state, winter, seasonal variations, phosphorus, calcium, retinol, vitamin E, alkaline phosphatase, growth rate, rickets, vitamin deficiencies.

Kaneps, A.J.; Huber, M.J.; Snyder, S.P. **Comparison of autogenous cancellous bone grafts obtained from the sternum and proximal portion of the tibia of llamas.** *Journal of the American Veterinary Medical Association*. Aug 1, 1999; 215(3): 362-365. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, tibia, sternum, autografts, volume, animal anatomy, surgery, histology.

Kovacs, B.Z.; Gauly, M.; Stranzinger, G. **Synaptonemal complex investigations on llamas (*Lama glama*) with differing fertility recordings.** *Journal of Animal Breeding and Genetics*. June 1999; 116(3): 235-242. ISSN: 0931-2668.

NAL call no.: 442.8 Z35

Descriptors: llamas, fecundity, synaptonemal complex, chromosome pairing, chromosome analysis, leukocytes, mitosis, meiosis, gametes, gametogenesis, sex differences, recombination, karyotypes, males.

La Perle, K.M.D.; Silveria, F.; Anderson, D.E.; Blomme, E.A.G. **Dalmeny disease in an alpaca (*Lama pacos*): sarcocystosis, eosinophilic myositis and abortion.** *Journal of Comparative Pathology*. Oct 1999; 121(3): 287-293. ISSN: 0021-9975.

NAL call no.: 41.8 J82

Descriptors: alpacas, sarcocystis, protozoal infections, myositis, abortion, case report, United States, Peru.

Lillich, J.D.; Roush, J.K.; DeBowes, R.M.; Mills, M.J. **Interlocking intramedullary nail fixation for a comminuted diaphyseal femoral fracture in an alpaca.** *Veterinary and Comparative Orthopaedics and Traumatology*. May 1999; 12(2): 81-84. ISSN: 0932-0814.

NAL call no.: SF910.5.V4

Descriptors: alpacas, femur, bone fractures, fracture fixation, nails, case report.

Mama, K.R.; A.E. Wagner, A.E.; Parker, D.A.; Hellyer, P.W.; Gaynor, J.S. **Determination of the minimum alveolar concentration of isoflurane in llamas.** *Veterinary Surgery*. Mar/Apr 1999; 28(2): 121-125. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: llamas, isoflurane, anesthesia, heart rate, respiration rate, blood pressure, blood, blood gases, pH, hematocrit, blood proteins, recovery, duration, animal behavior.

Marcelina, E. **Alpacas: An attractive & amicable acquisition for your land.** *AgVentures*. Dec 1999/Jan 2000; 3(6): 6-8, 10-13.

NAL call no.: S441.A475

Descriptors: alpacas, animal husbandry, animal production, markets.

Marriott, M.R.; Dart, A.J.; Macpherson, C.; Hodgson, D.R. **Repair of canial cruciata ligament rupture in an alpaca.** *Australian Veterinary Journal*. Oct 1999; 77(10): 654-655. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, ligaments, rupture, autografts, suture, stifle, treatment, case reports.

Marriott, M.R.; Dart, A.J.; Macpherson, C.; Hodgson, D.R. **Total ear canal ablation and lateral bulla osteotomy in an alpaca.** *Australian Veterinary Journal*. May 1999; 77(5): 301-302. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, otitis media, ablation, ears, surgical operations, case reports.

Massa, K.L.; Murphy, C.J.; Hartmann, F.A.; Miller, P.E.; Korsower, C.S.; Young, K.M. **Usefulness of aerobic microbial culture and cytologic evaluation of corneal specimens in the diagnosis of infectious ulcerative keratitis in animals.** *Journal of the American Veterinary Medical Association*. Dec 1, 1999; 215(11): 1671-1674. Includes refs. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: dogs, horses, cats, birds, llamas, cornea, keratitis, diagnosis, cell culture, cytology, diagnostic value.

McCracken, Thomas O.; Kainer, Robert A.; Spurgeon, Thomas Leslie. *Spurgeon's Color Atlas of Large Animal Anatomy: The Essentials*. 1st ed. Lippincott Williams & Wilkins, Philadelphia. c1999. xix, 160 p. col. ill. ISBN: 0683306731.

NAL call no.: SF761.M35 1999 Ov

Descriptors: large animal anatomy, veterinary, atlas.

Muntz, F.H.A. **Oxalate-producing pulmonary aspergillosis in an alpaca.** *Veterinary Pathology*. Nov 1999; 36(6): 631-632. ISSN: 0300-9858.

NAL call no.: 41.8 P27

Descriptors: alpacas, aspergillosis, *Aspergillus niger*, *Candida albicans*, calcium oxalate, crystals, case report.

Navarre, C.B.; Pugh, D.G.; Heath, A.M.; Simpkins, S.A. **Analysis of first gastric compartment fluid collected via percutaneous paracentesis from healthy llamas.** *Journal of the American Veterinary Medical Association*. Mar 15, 1999; 214(6): 812-815. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, body fluids, stomach, collection, sampling technique, percutaneous paracentesis, characteristics, safety, efficacy.

Obreque, V.; Mancilla, R.; Garcia-Huidobro, J.; Cothran, E.G.; Hinrichsen, P. **Thirteen new dinucleotide microsatellites in Alpaca.** *Animal Genetics*. Oct 1999; 30(5): 397-398. ISSN: 0268-9146.

NAL call no.: QP98.A1A5

Descriptors: alpacas, microsatellites, nucleotide sequences, alleles, heterozygosity, polymerase chain reaction, genetic polymorphism.

Molecular sequence data: genbank/af14076, genbank/af140768, genbank/af140769, genbank/af140770, genbank/af140771, genbank/af140772, genbank/af140773, genbank/af140774, genbank/af140775, genbank/af140776, genbank/af140777, genbank/af140778, genbank/af140779.

Paolicchi, F.; Uguieta, B.; Valle, L. del; Bustos-Obregon, E. **Biological activity of the seminal plasma of alpacas: stimulus for the production of LH by pituitary cells.** *Animal Reproduction Science*. Jan 8, 1999; 54(3): 203-210. ISSN: 0378-4320.

NAL call no.: QP251.A5

Descriptors: alpacas, seminal plasma, LH, hormone secretion, ovulation, anterior pituitary, cells, bioassays.

Pelant, R.K.; Chandra, B.; Pu, J.B.; Lohani, M.; Suknaphasawat, N.; Xu, G. **Small ruminants in development: the Heifer Project International experience in Asia.** *Small Ruminant Research*. Nov 1999; 34(3): 247-257. Includes refs.

Note: In the special issue: *Role of Small Ruminants in the Supply of Animal Products* / edited by G.F.W. Haenlein and M.H. Fahmy. Proceedings of the special symposium in conjunction with the 8th World Conference on Animal Production, June 28-July 4, 1998, Seoul, South Korea. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: goats, sheep, small ruminants, animal production, community development, voluntary services, breed differences, livestock numbers, Asia.

Abstract: For more than half a century, Heifer Project International (HPI), a charitable organization headquartered in Little Rock, AR, has been providing livestock and training in animal husbandry and sustainable agriculture to developing areas throughout the world. Since 1944, more than four million families have been assisted. More than 20 different kinds of food- and income-producing animals have been provided for communities and families in over 110 countries worldwide. Annually, HPI has projects in approximately 40 countries. Intensive training in animal husbandry, environmentally sound animal agriculture practices and community development are all part of HPI's program. HPI has had a long history with using small ruminants, from sheep and goats to llamas and alpacas, around the world. Small ruminants are of a most convenient size and prolificacy for the small holders that HPI typically partners with, and they are among the most diverse and multipurpose of all livestock species. In Asia, HPI uses small ruminants in development programs in the People's Republic of China, the Democratic People's Republic of Korea, Thailand, India, Sri Lanka, Nepal, Bangladesh, Vietnam and Indonesia. All of these programs are with limited resource families living in marginal, rural conditions. The programs are geared toward increasing peoples' income and nutritional status, while enhancing their dignity and benefitting the ecology.

Penedo, M.C.T.; Caetano, A.R.; Cordova, K. **Eight microsatellite markers for South American camelids.** *Animal Genetics.* Apr 1999; 30(2): 166-167. ISSN: 0268-9146.

NAL call no.: QP98.A1A5

Descriptors: llamas, alpacas, guanacos, microsatellites, genetic markers, DNA libraries, nucleotide sequences, gene frequency, heterozygosity, polymerase chain reaction, genetic polymorphism.

Molecular sequence data: genbank/af091122, genbank/af091123, genbank/af091124, genbank/af091125, genbank/af091126, genbank/af091127, genbank/af091128, genbank/af091129.

Penedo, M.C.T.; Caetano, A.R.; Cordova, K.I. **Six microsatellite markers for South American camelids.** *Animal Genetics.* Oct 1999; 30(5): 399. Includes refs. ISSN: 0268-9146

NAL call no.: QP98.A1A5

Descriptors: llamas, alpacas, microsatellites, genetic markers, nucleotide sequences, alleles, gene frequency, heterozygosity.

Molecular sequence data: genbank/af142656, genbank/af142657, genbank/af142658, genbank/af142659, genbank/af142660, genbank/af142661.

Pizarro R., Ramon (Pizarro Rodriguez). *Camelidotecnia: Camelidos Sudamericanos, Alpaca, Guanaco, Llama, Vicuna.* 1. ed. [Peru?: s.n., 1999] xxii, 206 p., ill. (some col.), maps. Includes refs. p. 197-200. ISBN: 997291500X. Note: In Spanish.

NAL call no.: SF401.L35P59 1999

Descriptors: llamas, alpacas, guanacos, vicunas, South America.

Pugh, D.G.; Navarre, C.B.; Ruffin, D.C.; Belknap, E.B. **A review of diagnostic procedures in llamas and alpacas.** *Veterinary Medicine.* July 1999; 94(7): 654-659. ISSN: 8750-7943.

NAL call no.: 41.8 M69

Descriptors: llamas, alpacas, diagnostic techniques, cerebrospinal fluid, gastric juices, body fluids, collection, liver, biopsy, bone marrow, catheterization, peritoneal fluid.

Pugh, D.G. **Small ruminant medicine for the small animal veterinarian.** *Proceedings of the North American Veterinary Conference.* 1999; 13: 318-320. Note: Meeting held on Jan. 9-13, 1999, Orlando, Florida.

NAL call no.: SF605.N672

Descriptors: llamas, sheep, goats, small animal practice.

Puntel, M.; Fondevila, N.A.; Blanco-Viera, J.; O'Donnell, V.K.; Marcovecchio, J.F.; Carrillo, B.J.; Schudel, A.A.

Serological survey of viral antibodies in llamas (*Lama glama*) in Argentina. *Journal of Veterinary Medicine, Series B.* Apr 1999; 46(3): 157-161. ISSN: 0931-1793.

NAL call no.: 41.8 Z52

Descriptors: bluetongue virus, llamas, serological surveys, antibodies, bovine adenovirus, bovine herpesvirus 1, bovine diarrhea virus, bovine enterovirus, bovine leukemia virus, aphthovirus, rotavirus, incidence, seroprevalence, Argentina.

Raggi, L.A.; Ferrando, G.; Parraguez, V.H.; MacNiven, V.; Urquieta, B. **Plasma progesterone in alpaca (*Lama pacos*) during pregnancy, parturition and early postpartum.** *Animal Reproduction Science.* Jan 29, 1999; 54 (4): 245-249. ISSN: 0378-4320.

NAL call no.: QP251.A5

Descriptors: alpacas, pregnancy, parturition, postpartum period, progesterone, blood plasma.

Sarno, R.J.; Clark, W.R.; Bank, M.S.; Prexl, W.S.; Johnson, W.E.; Behl, M.J. **Juvenile guanaco survival: management and conservation implications.** *Journal of Applied Ecology.* 1999; 36(6): 937-945.

URL: <http://www.blackwell-synergy.com/doi/abs/10.1046/j.1365-2664.1999.00449.x>

NAL call no.: 410 J828

Descriptors: guanacos, young animals, reproductive capacity, conservation, population levels, natural resource management, sustained yields, juvenile factors, sex, birthrate, mean monthly snowfall, adult female behaviors, radio-collar study of juveniles, Torres del Paine National Park, Chile.

Sarno, R.J.; Franklin, W.L. **Maternal expenditure in the polygynous and monomorphic guanaco: suckling behavior, reproductive effort, yearly variation, and influence on juvenile survival.** *Behavioral Ecology.* 1999; 10(1): 41-47. ISSN: 1465-7279 (online). ISSN: 1045-2249 (print).

URL: <http://beheco.oxfordjournals.org/cgi/content/abstract/10/1/41>

Descriptors: guanacos, reproduction, birth weights, suckling behaviors, polygynous monomorphic animals, survival rates, influences on survival of juveniles, no sex bias in maternal behaviors, comparison study, Chile.

Sarno, R.J.; Franklin, W.L. **Population density and annual variation in birth mass of guanacos in southern Chile.** *Journal of Mammalogy.* 1999; 80: 1158-1162. ISSN: 1545-1542.

NAL call no.: 410 J823

Descriptors: guanacos, reproductive potential, populations levels, year-to-year fluctuations in numbers of births, natural resource management, Chile.

Schmidtman, E.T.; Tabachnick, W.J.; Hunt, G.J.; Thompson, L.H.; Hurd, H.S. **1995 Epizootic of vesicular stomatitis (New Jersey serotype) in the western United States: an entomologic perspective.** *Journal of Medical Entomology.* Jan 1999; 36(1): 1-7. ISSN: 0022-2585.

NAL call no.: 421 J828

Descriptors: vesicular stomatitis virus, serotypes, epidemics, horses, cattle, llamas, disease distribution, disease transmission, disease vectors, hematophagous insects, epidemiology, seasonality, western states, United States.

Abstract: Entomologic and epizootic data are reviewed concerning the potential for transmission of vesicular stomatitis (VS) virus by insects, including field data from case-positive premises in New Mexico and Colorado during the 1995 outbreak of the New Jersey serotype (VSNJ). As with previous outbreaks of VSNJ in the western United States, the 1995 epizootic illustrated that risk of exposure is seasonal, increasing during warm weather and decreasing with onset of cool weather; virus activity spread from south to north along river valleys of the southwestern and Rocky Mountain states; clinical disease was detected most commonly in horses, but also occurred in cattle and 1 llama; and most infections were subclinical. Overall, 367 case-positive premises were identified during the 1995 outbreak, with foci of virus activity along the Rio Grande River south of Albuquerque, NM, in southwestern Colorado, and along the Colorado River near Grand Junction, CO. The establishment of a 16-km (10-mile) radius zone of restricted animal movement around confirmed positive premises, along with imposition of state and international embargoes, created economic hardship for livestock owners and producers. The importance of defining the role of blood-feeding insects as biological vectors of VSNJ virus relative to risk factors that promote high levels of insect transmission, such as the presence of livestock along western river valleys, blood feeding activity, and frequent transport of animals for recreational purposes, is emphasized as a basis for developing effective disease management.

Sivasankar, M. **Immunodeficiency syndrome in a 3-year-old llama.** *Canadian Veterinary Journal*. Apr 1999; 40(4): 271-272. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: llamas, immunological deficiency, respiratory diseases, diagnosis, age, case reports.

Sutmoller, P.; Taylor, Paul. **An Assessment of the Risk of Disease Transmission by Llama Embryos.** [United States?: s.n., 1999?] 22 leaves, ill.

NAL call no.: SF997.5.L35S88 1999

Descriptors: llamas, diseases, disease transmission, embryos as a disease reservoir, risk assessment, Chile.

Thurmon, J.C.; Sarr, R.; Denhart, J.W. **Xylazine sedation antagonized with tolazoline.** *Compendium on Continuing Education for the Practicing Veterinarian*. Jan 1999; 21(1, Suppl.): S11-S20. ISSN: 0193-1903.

NAL call no.: SF601.C66

Descriptors: ruminants, xylazine, preanesthetic medication, alpha adrenergic receptors, muscle relaxants, analgesics, antagonists, dosage, anesthesia, cattle, llamas, conduction anesthesia, pain, butorphanol.

Timm, K.I.; Watrous, B.J.; Smith, B.B. **Radiographic contrast gastrointestinal study of the neonatal llama.** *Veterinary Radiology & Ultrasound*. Nov/Dec 1999; 40(6): 596-604. ISSN: 1058-8183.

NAL call no.: SF757.8.A4

Descriptors: llamas, newborn animals, stomach, contrast media, duodenum, small intestine, colon, transit time, reticular groove, barium, radiography, crias, duodenal ampulla.

Tornquist, S.J.; Van Saun, R.J.; Smith, B.B.; Cebra, C.K.; Snyder, S.P. **Hepatic lipidosis in llamas and alpacas: 31 cases (1991-1997).** *Journal of the American Veterinary Medical Association*. May 1, 1999; 214(9): 1368-1372. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, lipidosis, liver cells, risk factors, clinical aspects.

Weaver, D.M.; J.W. Tyler, J.W.; Marion, R.S.; Casteel, S.W.; Loiacono, C.M.; Turk, J.R. **Subclinical copper accumulation in llamas.** *Canadian Veterinary Journal*. June 1999; 40(6): 422-424. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: llamas, copper, poisoning, mineral supplements, liver, blood serum, gamma glutamyltransferase, l iditol dehydrogenase, aspartate aminotransferase, case reports.

1998

Anonymous. **The lure of llamas on your land.** *AgVentures*. Feb/Mar 1998; 2(1): 26, 28-29.

NAL call no.: S441.A475

Descriptors: llamas, animal production, animal husbandry.

Aba, Marcelo Alfredo. **Hormonal interrelationships in reproduction of female llamas and alpacas.** *Acta Universitatis Agriculturae Sueciae. Veterinaria*, 1401-6257; no. 35. Swedish University of Agricultural Sciences, Uppsala. 1998. 1 v. (various pagings): ill. ISBN: 9157654409.

NAL call no.: SF615.A28 no. 35

Descriptors: llamas, alpacas reproduction, endocrine aspects, progesterone, physiological effect.

Andreasen, C.B.; Pearson, E.G.; Smith, B.B.; Gerros, T.C.; Lassen, E.D. **Normal reference intervals and the effects of time and feeding on serum bile acid concentrations in llamas.** *Journal of Veterinary Diagnostic Investigation*. Apr 1998; 10(2): 174-178. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, bile acids, serum, blood chemistry, feed intake, time, fasting, temporal variation, sex differences.

Anderson, D.E.; Leveille, R.; Scrivani, P.; Bromel, C. **Performing percutaneous liver biopsy in alpacas and llamas.** *Veterinary Medicine*. Feb 1998; 93(2): 190, 192-193, 195. ISSN: 8750-7943.

NAL call no.: 41.8 M69

Descriptors: alpacas, llamas, liver biopsy, animal anatomy, veterinary equipment, complications.

Bakker, M.L.; Gordon, I.J.; Milne, J.A. **Effects of sward structure on the diet selected by guanacos (*Lama guanicoe*) and sheep (*Ovis aries*) grazing a perennial ryegrass-dominated sward.** *Grass and Forage Science*. Mar 1998; 53(1): 19-30. Includes refs. ISSN: 0142-5242.

NAL call no.: 60.19 B773

Descriptors: guanacos, sheep, *Lolium perenne*, grass sward, plant height, stems, selective grazing, cutting height, leaves, leaf sheaths, grassland management, Scotland.

Bank, M.S.; Franklin, W.L. **Mountain lion (*Puma concolor patagonica*) feeding observations and attacks on guanacos (*Lama guanicoe*).** *Mammalia*. 1998; 62(4): 599-605. ISSN: 0026-1461.

NAL call no.: 410 M31

Descriptors: guanacos, South American mountain lion, *Puma concolor patagonica*, prey/predator relationships, predator feeding behaviors, attacks on guanacos, populations controls, resource management.

Bennett, J.; Kennel, A.; Stanhope, C.R. **Surgical correction of an acquired vaginal stricture in a llama, using a carbon-dioxide laser.** *Journal of the American Veterinary Medical Association*. May 1, 1998; 212(9): 1436-1437. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, vagina, abnormalities, laser surgery, case reports.

Bergman, D.L.; Huffman, L.E.; Paulson, J.D. **North Dakota's cost-share program for guard animals.** *Proceedings of the Vertebrate Pest Conference*. 1998; 18: 122-125. ISSN: 0507-6773.

NAL call no.: SB950.A1V4

Descriptors: guard dogs, livestock, llamas, donkeys, predator control.

Castellaro G, G.; Garcia-Huidobro, P. de A.J.; Salinas, P. **Alpaca liveweight variations and fiber production in Mediterranean range of Chile.** *Journal of Range Management*. Sept 1998; 51(5): 509-513. ISSN: 0022-409X.

NAL call no.: 60.18 J82

Descriptors: alpacas, grazing, botanical composition, biomass, mediterranean climate, body weight, liveweight gain, weight losses, growth curve, age differences, sex differences, staple, fleece weight, growth rate, metabolizable energy, protein content, crude protein, Chile.

Abstract: A study of liveweight changes of alpaca adult males, females, and their progeny, was conducted through 3 seasons under continuous grazing on natural grasslands on the Mediterranean range of the Chilean Central Zone. Liveweight changes were positive and highest in spring (100 to 200 g day⁻¹), moderate during winter (50 to 100 g day⁻¹), and negative only at the end of summer and in fall (-110 to -150 g day⁻¹). Weight gains of new born alpacas were greatest (110 to 150 g day⁻¹) in the first 90 days after birth and then decreased slightly, reaching values of 75 g day⁻¹ at 8.5 months old. Weight gains stabilized at 10 to 20 g day⁻¹ at 3-years of age. The average annual fibre production was 1.57 and 236 kg in females and males, respectively; staple length varied between 8 and 10 cm.

Cavalcanti, S.M.C.; Knowlton, F.F. **Evaluation of physical and behavioral traits of llamas associated with aggressiveness toward sheep-threatening canids.** *Applied Animal Behaviour Science*. Dec 28, 1998; 61 (2): 143-158. ISSN: 0168-1591.

NAL call no.: QL750.A6

Descriptors: llamas, aggressive behavior, dogs, leadership, awareness, body weight, predation, predator control, social behavior.

Cebra, C.K.; Cebra, M.L.; Garry, F.B.; Larsen, R.S.; Baxter, G.M. **Acute gastrointestinal disease in 27 new world camelids: clinical and surgical findings.** *Veterinary Surgery*. Mar/Apr 1998; 27(2): 112-121. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: llamas, alpacas, gastrointestinal diseases, clinical aspects, surgery, survival, mortality, treatment, pathology, blood chemistry, metabolism, pH.

Cicchino, A.C.; Munoz-Cobenas, M.E.; Bulman, G.M.; Diaz, J.C.; Laos, A. **Identification of *Microthoracius mazzai***

(Phthiraptera: Anoplura) as an economically important parasite of alpacas. *Journal of Medical Entomology*. Nov 1998; 35(6): 922-930. ISSN: 0022-2585.

NAL call no.: 421 J828

Descriptors: Anoplura, redescription, morphology, taxonomy, ectoparasites, alpacas, lice infestation losses, moxidectin, insect control, Peruvian Andes.

Abstract: The hematophagous sucking louse *Microthoracius mazzai* Werneck, 1932, is redescribed and identified as a parasite of alpacas, *Lama pacos* L. Specimens were collected on animals 10-14 mo old, located on a large community farm at 4,600 m above sea level in the Peruvian Andes. In total, 26 scanning electron microscope (SEM) figures are included that highlight salient and differential characteristics, especially the unique elongated spindle-shaped head, which is almost as long as its abdomen. Alpacas, 1 of the 4 species of South American camelids, are important for their production of high-quality wool in the Andes Mountain range countries, especially Peru and Bolivia; to a lesser degree Chile; and more recently Argentina, where breeding and disease control programs are receiving increased technical support. Information is given on the prevalence of lice infestations in the flock, clinical signs, and economic losses. We report the efficacy of moxidectin (SC, 200 mcg/kg, b.w.) in a repeated treatment program of 7-10 d, which is currently used for mange control in these ruminants.

Cole, D.N.; Spildie, D.R. **Hiker, horse and llama trampling effects on native vegetation in Montana, USA.** *Journal of Environmental Management*. May 1998; 53(1): 61-71. ISSN: 0301-4797.

NAL call no.: HC75.E5J6

Descriptors: llamas, horses, hikers, *Equisetum*, *Vaccinium*, vegetation, ground cover, hiking, trampling, trail traffic, tourism, National Forests, mountain areas, soil degradation, equations, Montana, ecotourism, Lolo National Forest, soil exposure.

Davis, R.; Keeble, E.; Wright, A.; Morgan, K.L. **South American camelids in the United Kingdom: population statistics, mortality rates and causes of death.** [Erratum: Feb 28, 1998, 142(9): 223.] *Veterinary Record* (London). Feb 14, 1998; 142(7): 162-166. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, alpacas, guanacos, animal health, livestock numbers, mortality, causes of death, surveys, age, sex, United Kingdom.

DeLuca, T.H.; Patterson, W.A. IV.; Freimund, W.A.; Cole, D.N. **Influence of llamas, horses, and hikers on soil erosion from established recreation trails in western Montana, USA.** *Environmental Management*. Mar/Apr 1998; 22(2): 255-262. ISSN: 0364-152X.

NAL call no.: HC79.E5E5

Descriptors: llamas, horses, hikers, comparison, environmental impacts, pack and trail animals, Montana.

Dey, Dennis H.; Alberta Agriculture, Food, and Rural Development. Alberta Farm Business Management Initiative. **Commercial Alpaca Industry.** Alberta Agriculture, Food and Rural Development: Alberta Farm Business Management Initiative, [Edmonton, Alta.?]. [1998] 11 p.

NAL call no.: SF401.A4C66 1998

Descriptors: alpaca farming, economic aspects, agricultural diversification, Alberta, Canada.

Fowler, Murray E. **Medicine and Surgery of South American Camelids: Llama, Alpaca, Vicuna, Guanaco.** 2nd ed. Iowa State University Press, Ames. 1998. vii, 549 p., ill. ISBN: 0813803977.

NAL call no.: SF997.5.L35F68 1998

Descriptors: Genus *Lama*, camelids, diseases, treatment, diagnosis, llamas, vicuna, alpaca, surgery.

Frank, N.; Couetil, L.L.; Clarke, K.A. **Listeria monocytogenes and Escherichia coli septicemia and meningoencephalitis in a 7-day-old llama.** *Canadian Veterinary Journal*. Feb 1998; 39(2): 100-102. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: llamas, *Listeria monocytogenes*, *Escherichia coli*, septicemia, meningoencephalitis, cerebrospinal fluid, blood, passive immunity, symptoms, drug therapy.

Fraser, M.D.; Baker, D.H. **A comparison of voluntary intake and in vivo digestion in guanacos (*Lama guanicoe*) and sheep given fresh grass.** *Animal Science*. Dec 1998; 67(pt. 3): 567-572. Includes refs. ISSN: 1357-7298.

NAL call no.: SF1.A56

Descriptors: *Lama guanicoe*, sheep, species differences, voluntary intake, zero grazing, *Lolium perenne*, maturity stage, green feed, organic matter, fiber content, crude protein, digestibility, feeding preferences.

Fraser, M.D. **Diet composition of guanacos (*Lama guanicoe*) and sheep (*Ovis aries*) grazing in grassland communities typical of UK uplands.** *Small Ruminant Research*. June 29, 1998; 29(2): 201-212. Includes refs. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: guanacos, sheep, Poaceae, forbs, stems, inflorescences, seeds, mosses, grazing, feed intake, forage, botanical composition, plant communities, biomass, grass sward, feeding preferences, United Kingdom.

Fraser, M.D.; Moorby, J.M. **Plasma biochemical values in the guanaco (*Lama guanicoe*) and a comparison with the sheep.** *Animal Science*. Feb 1998; 66(pt. 1): 209-216. Includes refs. ISSN: 1357-7298.

NAL call no.: SF1.A56

Descriptors: guanacos, blood plasma, ewes, species differences, blood sugar, metabolites, 3-hydroxybutyric acid, blood protein, serum albumin, globulins, urea, amino nitrogen.

Gerros, T.C. **Recognizing and treating urolithiasis in llamas.** *Veterinary Medicine*. June 1998; 93 (6): 583-584, 586, 588, 590. ISSN: 8750-7943.

NAL call no.: 41.8 M69

Descriptors: llamas, urolithiasis, urethra, etiology, clinical aspects, pathogenesis, diagnosis, treatment, postoperative care, disease prevention, silica, hydroxyapatite, magnesium ammonium phosphate.

Gustafson, L.L., Franklin, W.L.; Sarno, R.S.; Hunter, R.H.; Johnson, W.E.; Young, K.M.; Behl, M.J. **Predicting early mortality of newborn guanacos by birthweight and hematological parameters.** *Journal of Wildlife Management*. 1998; 62(1): 24-35. ISSN: 0022-541X.

URL: <http://www.wildlife.org/publications>

NAL call no.: 410 J877

Descriptors: guanacos, neonates, reproduction, birth weights, blood parameters, predicting early deaths, survivability of newborns.

Hamir, A.N.; Moser, G. **Immunohistopathological findings in an adult llama with listeriosis.** *Veterinary Record* (London). Oct 24, 1998; 143(17): 477-479. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, *Listeria monocytogenes*, immunohistochemistry, histopathology, report.

Hamir, A.N.; Habecker, P.L.; C. Tillman, C. **Pancreatic necrosis in a llama.** *Veterinary Record* (London). June 6, 1998; 142(23): 644-645. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, pancreatitis, pancreas, necrosis, case report.

Hilton, C.D.; Pugh, D.G.; Wright, J.C.; Waldrige, B.M.; Simpkins, S.A.; Heath, A.M. **How to determine and when to use body weight estimates and condition scores in llamas.** *Veterinary Medicine*. Nov 1998; 93(11): 1015-1018. ISSN: 8750-7943.

NAL call no.: 41.8 M69

Descriptors: llamas, body weight, body condition, estimation, accuracy.

Hutchinson, J.M.; M.D. Salman, M.D.; Garry, F.B.; Johnson, L.W.; Keefe, T.J. **Characterization of plasma immunoglobulin G concentrations of llamas.** *American Journal of Veterinary Research*. Apr 1998; 59(4): 406-409. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, IgG, blood plasma, normal values, age differences, sex differences, body condition, animal husbandry, farms, variation.

Iniguez, L.C.; Alem, R.; Wauer, A.; Mueller, J. **Fleece types, fiber characteristics and production system of an outstanding llama population from southern Bolivia.** *Small Ruminant Research.* Aug 1998; 30(1): 57-65. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: llamas, fiber quality, diameter, medullation, fleece, grazing systems, botanical composition, swamps, mountain grasslands, extensive livestock farming, coat, color, sex differences, staple, breaking strength, Bolivia, kjara fleece, thampull, fleece.

King, M.R.; D.A. Hendrickson, D.A.; Southwood, L.L.; Trumble, T.N.; Johnson, L.W. **Laparoscopic ovariectomy in two standing llamas.** *Journal of the American Veterinary Medical Association.* Aug 15, 1998; 213(4): 523-525. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, ovariectomy, laparoscopy, complications, surgical techniques.

Lama Owners Directory. [International Llama & Alpaca Directory.] Able Pub., Manhattan, KS. [1998?-] v.: ill.

NAL call no.: SF401.L6L38

Descriptors: llama breeders, directories, United States, Canada.

Lichtenwalner, A.B.; Woods, G.L.; Weber, J.A. **Male llama choice between receptive and nonreceptive females.** *Applied Animal Behaviour Science.* Sept 1998; 59(4): 349-356. Includes refs. ISSN: 0168-1591.

NAL call no.: QL750.A6

Descriptors: llamas, mating behavior, teasing, male animals.

Lopez, A.; Maiztegui, J.; Cabrera, R. **Voluntary intake and digestibility of forages with different nutritional quality in alpacas (*Lama pacos*).** *Small Ruminant Research.* July 8, 1998; 29(3): 295-301. ISSN: 09 21-4488.

NAL call no.: SF380.I52

Descriptors: alpacas, voluntary intake, digestibility, forage, feed intake, dry matter, hay, *Festuca*, ryegrass hay, clover hay, wheat straw, fiber content, hemicelluloses, cellulose, organic matter, nutritive value, Chile.

Lopez, M.J.; Markel, M.D.; Dubielzig, R. **Urinary obstruction in a hermaphroditic llama.** *Journal of the American Veterinary Medical Association.* Mar 1, 1998; 212(5): 710-712. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, newborn animals, hermaphroditism, urination disorders, blockage, urethra, organ duplication, case reports.

Lopez, S.; Llamazares, E.; Gonzalez, J.S. **Determination of ammonia nitrogen in the urine of small ruminants.** *Journal of the Science of Food and Agriculture.* Sept 1998; 78(1): 95-101. ISSN: 0022-5142.

NAL call no.: 382 So12

Descriptors: sheep, goats, ammonia, ammonium nitrogen, urine, urine analysis, colorimetry, distillation, titration, urea.
Abstract: The objective of the present work was to compare colorimetric and distillation-titration methods to determine the ammonia-nitrogen (NH₃-N) concentration in sheep and goat urine samples. Colorimetric methods used were based on the indophenol reaction, whereas titrimetric methods were based on the alkali distillation of ammonia from the urine and its titrimetric determination with a standard acid. Colorimetric methods were only reliable when urine samples were diluted at least 1: 20. Both colorimetric and alkali-distillation methods gave quantitative recoveries with standard NH₃-N solutions, but when NH₃-N was determined in urine samples there was a significant discrepancy between analytical methods on the measured concentrations. These were between 1.3 and 10-fold (on average 2.6-fold) higher with alkali distillation than with the colorimetric method. The difference between concentrations measured by both analytical methods was significantly related ($R^2 = 0.990$; $p < 0.001$) to the concentration of urea in the urine samples. To study the effect of urea concentration, standard solutions containing variable concentrations of urea and NH₃-N were prepared, and NH₃-N concentration determined by both methods. Concentrations measured by colorimetry were similar to the actual concentrations irrespective of the urea concentration of the solutions. In urea-free solutions, alkali-distillation methods gave values similar to the actual concentrations, but when urea was present observed values were consistently higher than the expected concentrations. The overestimation increased with the urea concentration of the

solutions, with a significant ($P < 0.001$) relationship between both variables. Colorimetric methods were more reliable to measure $\text{NH}_3\text{-N}$ concentrations in urine samples containing high urea concentrations.

Morrow, C.K.; Barrington, G.M.; Johnson, L.W.; Hendrickson, D.A. **How to perform laparoscopic ovariectomy in llamas and alpacas.** *Veterinary Medicine*. Mar 1998; 93(3): 295-296, 298. ISSN: 8750 -7943.

NAL call no.: 41.8 M69

Descriptors: llamas, alpacas, ovariectomy, laparoscopy.

Navarre, C.B. **Neonatology of the South American camelid.** *Proceedings of the North American Veterinary Conference*. 1998; 12: 1063-1064.

NAL call no.: SF605.N672

Descriptors: llamas, alpacas, newborn animals, young animal diseases, colostrum.

Otto, K.A.; Short, C.E. **Pharmaceutical control of pain in large animals.** *Applied Animal Behaviour Science*. Aug 1998; 59(1/3): 157-169. ISSN: 0168-1591.

NAL call no.: QL750.A6

Descriptors: cattle, horses, sheep, goats, pigs, llamas, analgesics, pain, responses, animal behavior, dosage, animal welfare, species differences, conduction anesthesia, agonists, literature reviews.

Palmer, J.L.; Dykes, N.L.; Love, K.; Fubini, S.L. **Contrast radiography of the lower urinary tract in the management of obstructive urolithiasis in small ruminants and swine.** *Veterinary Radiology & Ultrasound*. May/June 1998; 39(3): 175-180. ISSN: 1058-8183.

NAL call no.: SF757.8.A4

Descriptors: goats, sheep, calves, pigs, llamas, radiography, urinary tract, urolithiasis, treatment, urethra, veterinary medicine, veterinary equipment, techniques, contrast media.

Quist, C.F.; Dutton, D.M.; Schneider, D.A.; Prestwood, A.K. **Gastrointestinal ulceration and pulmonary aspergillosis in a llama treated for parelaphostrongylosis.** *Journal of the American Veterinary Medical Association*. May 1, 1998; 212(9): 1438-1441. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, *Parelaphostrongylus tenuis*, nematode infections, ulcers, *Aspergillus fumigatus*, lungs, corticoids, ceftiofur, cimetidine, drug therapy, case report, Georgia (U.S.)

Rodgerson, D.H.; Baird, A.N.; Lin, H.C.; Pugh, D.G. **Ventral abdominal approach for laparoscopic ovariectomy in llamas.** *Veterinary Surgery*. July/Aug 1998; 27(4): 331-336. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: llamas, female animals, ovariectomy, surgical techniques, evaluation, postoperative complications.

Smith, B.B.; Van Saun, R.J.; Reed, P.J.; Craig, A.M.; Youngberg, A. **Blood mineral and vitamin E concentrations in llamas.** *American Journal of Veterinary Research*. Aug 1998; 59(8): 1063-1070. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, blood chemistry, calcium, phosphorus, iron, copper, zinc, selenium, vitamin E, nutrient content, mineral content, iron binding capacity, transferrin, normal values, age differences, pregnancy.

Smith, B.B. **An overview of selected diseases and drug needs in the llama and alpaca industries.** *Veterinary and Human Toxicology*. 1998; 40(suppl.1): 29-34. ISSN: 0145-6296.

NAL call no.: SF601.A47

Descriptors: alpacas, llamas, dosage, peptic ulcers, need for new drugs, various diseases.

Stang, B.V.; Koller, L.D. **Neopterin values in selected groups of normal animals.** *Research in Veterinary Science*. July/Aug 1998; 65(1): 87-88. ISSN: 0034-5288.

NAL call no.: 41.8 R312

Descriptors: dairy cattle, llamas, dogs, cats, rats, horses, racehorses, thoroughbred, blood plasma, blood chemistry, neopterin, normal values, species differences.

Abstract: To establish baseline information on neopterin concentrations in livestock, companion and laboratory animals

and identify the factors that may influence these concentrations, blood samples were taken from normal dairy cattle, horses, llamas, dogs, cats and rats of varying ages and sexes. In addition, neopterin concentrations in normal, adult equines were compared with those found in racing Thoroughbreds. There were no differences due to sex, sexual maturity, pregnancy, castration, or age. For all ages and sexes combined, mean neopterin concentrations were significantly lower in llamas (2.27 +/- 0.33 nmol litre⁻¹) and rats (2.13 +/- 0.21 nmol litre⁻¹) when compared with the other species tested. Racing Thoroughbreds demonstrated higher neopterin values than adult equines not in training (3.54 +/- 0.64 vs 3.13 +/- 1.02 nmol litre⁻¹).

Stevens, J.B.; Thoen, C.O.; Rohonczy, E.B.; Tessaro, S.; Kelly, H.A.; Duncan, J.R. **The immunological response of llamas (*Lama glama*) following experimental infection with *Mycobacterium bovis*.** *Canadian Journal of Veterinary Research*. Apr 1998; 62(2): 102-109. ISSN: 0830-9000.

NAL call no.: SF601.C24

Descriptors: llamas, *Mycobacterium bovis*, experimental infection, dosage, immune response, skin tests, ELISA, diagnostic techniques, evaluation, mortality, serology, antigens, lesions, immunodiagnosis, clinical aspects, symptoms, postmortem examinations.

Tyler, J.W.; Middleton, J.R.; Barbee, D.D.; Parish, S.M. **Conservative management of a ruptured gastrocnemius muscle in a male llama.** *Canadian Veterinary Journal*. Nov 1998; 39(11): 712-713. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: llamas, skeletal muscle, rupture, treatment, immobilization, limbs, case report.

Van Hoogmoed, L.; Rakestraw, P.C.; Snyder, J.R.; Harmon, F.A. **Role of nitric oxide in in-vitro contractile activity of the third compartment of the stomach in llamas.** *American Journal of Veterinary Research*. Sept 1998; 59(9): 1166-1169. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, stomach, stomach motility, smooth muscle, muscle contraction, electrical stimulation, in-vitro, nitric oxide, neurotransmitters, inhibition, atropine, beta blockers, indometacin, apamin, antagonists, contractility, guanethidine, n-omega-nitro-L-arginine-methyl- ester, nitric oxide antagonists.

Van Hoogmoed, L.; Snyder, J.R.; Vasseur, P. **Surgical repair of patellar luxation in llamas: 7 cases (1980-1996).** *Journal of the American Veterinary Medical Association*. Mar 15, 1998; 212 (6): 860-865. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, stifle, animal anatomy, patella, dislocations, surgery, prognosis.

Van Hoogmoed, L.; Roberts, G.; Snyder, J.R.; Yarbrough, T.; Harmon, F. **Use of computed tomography to evaluate the intestinal tract of adult llamas.** *Veterinary Radiology & Ultrasound*. Mar/Apr 1998; 39(2): 117-122. ISSN: 1058-8183.

NAL call no.: SF757.8.A4

Descriptors: llamas, computed tomography, digestive tract, barium sulfate, colic, ulcers, animal anatomy.

Waldrige, B.M.; Pugh, D.G.; Paxton, R.; Spano, J.S. **Measurement of passive transfer in neonatal llamas.** *Equine Practice*. Feb 1998; 20(2): 6, 8-9. ISSN: 0162-8941.

NAL call no.: SF951.E62

Descriptors: llamas, newborn animals, passive immunity, IgG, blood serum, measurement, blood proteins, immunodiffusion tests, electrophoresis, gamma glutamyltransferase, immunoprecipitation tests.

Waldrige, B.M.; Davidson, M.L.; Rolsma, M.; Navarre, C.B.; Heath, A.M.; Pugh, D.G. **Rabies in a llama.** *Veterinary Medicine*. Oct 1998; 93(10): 934-936. ISSN: 8750-7943.

NAL call no.: 41.8 M69

Descriptors: llamas, rabies, rabies virus, differential diagnosis, aggressive behavior, case report.

Walters, P. **The huggable Alpaca.** *AgVentures*. Apr/May 1998; 2(2): 14-15, 18-22, 24.

NAL call no.: S441.A475

Descriptors: alpacas, alternative farming, animal fibers, animal production.

Watson, A.E.; Christensen, N.A.; Blahna, D.J.; Archibald, K.S. **Comparing manager and visitor perceptions of llama use in wilderness.** *Research paper RMRS [Rocky Mountain Research Station]*. Sept 1998; (10) 7 p.

NAL call no.: aSD144.A14R472

Descriptors: wilderness trips using pack llamas, visitors acceptance, managers perceptions.

Wherrit, I.; Milde, F. **Alpacas of Tolst Hills Farm.** *Small Farm Today*. Feb/Mar 1998; 15 (1): 33-34. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: description, breeding farm for alpacas, Iowa.

Wright, A.; Davis, R.; Keeble, E.; Morgan, K.L. **South American camelids in the United Kingdom: reproductive failure, pregnancy diagnosis and neonatal care.** *Veterinary Record* (London). Feb 28, 1998; 142(9): 214-215. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, alpacas, guanacos, reproductive disorders, pregnancy diagnosis, newborn animals, animal husbandry, dipping, umbilicus, abortion, fetal death, perinatal mortality, United Kingdom.

1997

Alden, J. **About llamas.** *Small Farm Today*. Feb/Mar 1997; 14(1): 28-29. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, livestock enterprises, small farms, alternative livestock.

Anderson, D.E.; McLaughlin, R.M. **Fascia lata autograft for treatment of congenital cranial cruciate ligament deficiency in a llama.** *Journal of the American Veterinary Medical Association*. Mar 15, 1997; 210(6): 811-813. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, newborn animals, ligaments, stifle, tibia, skeletomuscular anomalies, autografts, case report.

Anderson, D.E.; Midla, L.T.; Scrivani, P.V.; Rosario, J.; Leveille, R.; Long, J.F.; Hull, B.L. **Multifocal polyostotic aneurysmal bone cysts in a llama.** *Journal of the American Veterinary Medical Association*. Mar 15, 1997; 210(6): 808-810. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, bone diseases, cysts, vascular diseases, femur, bone fractures, case reports.

Andrews, A.H. **Suspected nutritional deficiency causing anaemia in llamas (*Lama glama*).** *Veterinary Record* (London). Feb 8, 1997; 140(6): 153-154. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, nutrient deficiencies, anemia, copper, blood plasma, treatment, case reports.

Atlee, B.A.; Stannard, A.A.; Fowler, M.E.; Willemse, T.; Ihrke, P.J.; Olivry, T. **The histology of normal llama skin.** *Veterinary Dermatology*. Sept 1997; 8(3): 165-176. ISSN: 0959-4493.

NAL call no.: SF901.V47

Descriptors: llamas, skin, coat, histology, thickness, skin glands, shedding, body regions, smooth muscle, blood vessels, species differences, pili muscles.

Barlough, J.E.; Madigan, J.E.; Turoff, D.R.; Clover, J.R.; Shelly, S.M.; Dumler, J.S. **An *Ehrlichia* strain from a llama (*Lama glama*) and llama-associated ticks (*Ixodes pacificus*).** *Journal of Clinical Microbiology*. Apr 1997; 35(4): 1005-1007. ISSN: 0095-1137.

NAL call no.: QR46.J6

Descriptors: llama, *Ehrlichia phagocytophila* genogroup, ticks, *Ixodes pacificus*.

Abstract: An *Ehrlichia* WDS identified in the blood of a diseased llama (*Lama glama*). Sequencing of its 16S rRNA gene showed the *Ehrlichia* to be closely related to members of the *Ehrlichia phagocytophila* genogroup. The agent was also found in a pool of ticks (*Ixodes pacificus*) collected at the llama site.

Barrington, G.M.; Parish, S.M.; Tyler, J.W. **Chronic weight loss in an immunodeficient adult llama.** *Journal of the American Veterinary Medical Association.* Aug 1, 1997; 211(3): 294-298. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, immunological deficiency, weight losses, age, symptoms, diagnosis, treatment, case reports.

Birutta, Gale. **A guide to raising llamas: care, showing, breeding, packing, profiting.** *A Storey Animal Handbook.* c1997; vi, 327 p., ill. ISBN: 0882669540.

NAL call no.: SF401.L6B57 1997

Descriptors: llamas, general care and management, competitive showing.

Bravo, P.W.; Flores, U.; Garnica, J.; Ordonez, C. . **Collection of semen and artificial insemination of alpacas.** *Theriogenology.* 47(3): 619-626. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: alpacas, semen characters, artificial vagina, laparoscopy, cervix, artificial insemination, spermatozoa, pregnancy rate.

Abstract: Semen collection and artificial insemination have not yet been fully developed in the alpaca. Thus, we collected semen from 7 males using a modified artificial vagina placed inside a dummy. Forty adult female alpacas, previously induced to ovulate with hCG, were artificially inseminated with fresh undiluted semen by laparoscopy or by cervix. The Chi-square test was used to determine differences in the fertility rate of the 2 insemination methods. The mean duration of copulation, semen volume, sperm concentration and the percentages of live spermatozoa and normal spermatozoa were 21.6 min, 1.9 ml, 147,500/mm³ 69.6% and 75.9%, respectively. There were 6.7% abnormal heads, 12.3% abnormal tails and 3.8% cytoplasmic droplets. The consistency of semen was viscous and formed a coagulum. The pH was 7.2, and the semen was milky white in color. The duration of copulation was comparable to natural copulation, and semen characteristics reflected those of the natural ejaculate. The percentage of pregnancy was 68%, with no differences due to method of semen deposition (laparoscopy, 67%; cervix, 73%).

Bravo, P.W.; Flores, D.; Ordonez, C. **Effect of repeated collection on semen characteristics of alpacas.** *Biology of Reproduction.* Sept 1997; 57(3): 520-524. ISSN: 0006-3363.

NAL call no.: QL876.B5

Descriptors: alpacas, semen characters, ejaculate volume, spermatozoa, abnormalities, mating frequency, copulation, sperm motility, sperm concentration, sperm viability.

Bravo, P.W.; Garnica, J.; Fowler, M.E. **Immunoglobulin G concentrations in periparturient llamas, alpacas and their crias.** *Small Ruminant Research.* Dec 1, 1997; 26(1/2): 145-149. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: llamas, alpacas, parturition, prepartum period, postpartum period, IgG, blood serum, colostrum, milks, newborn animals, species differences, sex differences.

Cebra, C.K.; Cebra, M.L.; Garry, F.B.; Johnson, L.W. **Surgical and nonsurgical correction of uterine torsion in New World camelids: 20 cases (1990-1996).** *Journal of the American Veterinary Medical Association.* Sept 1, 1997; 211(5): 600-602. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, uterine torsion, surgical operations, medical treatment, complications, case reports, celiotomy, transvaginal manipulation, dam rolling.

Coulton, M.A.; McClintock, S.A.; Hodgson, D.R. **Sporodesmin toxicosis in an alpaca.** *Australian Veterinary Journal.* Feb 1997; 75(2): 136-137. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, *Pithomyces chartarum* mycotoxins, mycotoxicoses, feces, symptoms, case reports, photosensitization, *Lolium perenne*, paddocks, grazing, hematology, clinical aspects. blood chemistry, treatment, biopsy, histopathology, fungal spores, diagnosis, zinc, methionine.

Curtis, C.; Dart, A.J.; Rawlinson, R.J.; Hodgson, D.R. **Hypertrophic osteopathy in an alpaca.** *Australian Veterinary Journal.* Jan 1997; 75(1): 61-62. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, bone diseases, hypertrophy, symptoms, case reports.

Dart, A.J.; Dart, C.M.; Hodgson, D.R. **Surgical management of a ruptured bladder secondary to a urethral obstruction in an alpaca.** *Australian Veterinary Journal*. Nov 1997; 75(11): 793-795. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, urethra, blockage, bladder, rupture, surgical operations, urinary calculi, case reports.

Duke, T.; Egger, C.M.; Ferguson, J.G.; Frketic, M.M. **Cardiopulmonary effects of propofol infusion in llamas.** *American Journal of Veterinary Research*. Feb 1997; 58(2): 153-156. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, injectable anesthetics, dosage effects, cardiovascular system, anesthesia, blood pressure, heart rate, respiration rate, cardiac output, blood gases.

Feizabadi, M.M.; Robertson, I.D.; Hope, A.; Cousins, D.V.; Hampson, D.J. **Differentiation of Australian isolates of *Mycobacterium paratuberculosis* using pulsed-field gel electrophoresis.** *Australian Veterinary Journal*. Dec 1997; 75(12): 887-889. Includes refs. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: *Mycobacterium paratuberculosis*, strain differences, pulsed field electrophoresis, DNA, genetic variation, cattle, alpacas, sheep, goats, Australia.

Franklin, W.L.; Bas, F.M.; Bonacic, C.F.; Cunazza, C.P.; Soto, V.N. **Striving to manage Patagonia guanacos for sustained use in the grazing agroecosystems of southern Chile.** *Wildlife Society Bulletin*. 1997; 25: 65-73.

URL: <http://www.wildlife.org/publications>

NAL call no.: SK357.A1W5

Descriptors: guanacos, Patagonian, wildlife resource management, sustained use, populations management, grazing agroecosystems, Chile.

Gauly, Matthia; Brinkmann, Ursula. *New World Camelidae*. Parey, Berlin. 1997. xii, 173 p., ill. ISBN: 3826331443.

NAL call no.: SF401.L6N48 1997

Descriptors: llamas, alpacas, vicunas, guanacos, descriptions, characteristics, taxonomy.

Genin, D.; Tichit, M. **Degradability of Andean range forages in llamas and sheep.** *Journal of Range Management*. July 1997; 50(4): 381-385. ISSN: 0022-409X.

NAL call no.: 60.18 J82

Descriptors: llamas, sheep, forage, digestibility, grasses, shrubs, dry matter, degradation, kinetics, Andean highlands, arid lands, in sacco dry matter degradation, Bolivia.

Abstract: In sacco dry matter degradability (DMD) of the most commonly consumed range forages by llamas and sheep in the arid highlands of Bolivia was measured during the wet and dry seasons to determine if llamas exhibit a higher digestive ability than sheep. Results showed that degradability of low quality forages (DMD below 60% in sheep) was 20 to 30% higher for llamas than sheep, while no significant differences were found for highly digestible forages. There was a high correlation between DMD in llamas and sheep with a coefficient of determination of 0.96. Parameters of degradation curves indicated that llamas did not have higher microbial activity than sheep, since there was no consistent difference in degradation rates of the studied forages. Nonetheless, significantly higher potential degradability and effective degradability found in this study suggested that the longer retention time in the forestomach of llamas may be responsible for higher digestibility of poor quality forages.

Gionfriddo, J.R.; Gionfriddo, J.P.; Krohne, S.G. **Ocular diseases of llamas: 194 cases (1980-1993). [Erratum: Aug 15, 1997, 211(4): 469.].** *Journal of the American Veterinary Medical Association*. June 15, 1997; 210(12): 1784-1787. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, eye diseases, disease prevalence, susceptibility, disease resistance, disease surveys, cattle, horses, North America.

Goff, A. **Llama wool production: graduating from cottage industry status.** *Small Farm Today*. Feb/Mar 1997;

14(1): 30-31. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llama, wool production, economic factors.

Hamir, A.N.; Andreasen, C.B; Pearson, E.G. **Endogenous lipid pneumonia (Alveolar histiocytosis) and hydrocephalus in an adult llama (*Lama glama*)**. *Veterinary Record* (London). Nov 1, 1997; 141 (18): 474-475. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, pneumonia, hydrocephalus, histopathology, lesions, case reports.

Hamir, A.N.; Pierce, V.; Richardson, D. **Intraosseous hemangiosarcoma with metastasis in a three month old llama**. *Journal of Veterinary Diagnostic Investigation*. Apr 1997; 9(2): 210-213. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, young animals, sarcoma, blood vessels, metastasis, phalanges, lymph nodes, thorax, histopathology, case reports.

Hinrichs, K.; Horin, S.E.; Buoen, L.C.; Zhang, T.Q.; Ruth, G.R. **X-chromosome monosomy in an infertile female llama**. *Journal of the American Veterinary Medical Association*. May 15, 1997; 210 (10): 1503-1504. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, X chromosome, monosomy, female infertility, symptoms, sexual behavior, conformation, case reports.

International Llama & Alpaca Directory: Llama Owners Location Guide. 3rd ed. [Able Publishers, Manhattan, KS, 1997?] 60 p., col. ill., maps.

NAL call no.: SF401.L6I58 1997

Descriptors: llama breeders, alpacas, directories, United States, Canada.

International Llama Association (ILA). **ILA Conference**: [program and proceedings]. The Association, [Denver, Colo.], 1997. v.: ill.

NAL call no.: SF401.L6I57

Descriptors: llamas, conference.

Johnston, N.A.; Parish, S.M. ; Tyler, J.W.; Tillman, C.B. **Evaluation of serum gamma-glutamyltransferase activity as a predictor of passive transfer status in crias**. *Journal of the American Veterinary Medical Association*. Nov 1, 1997; 211 (9): 1165-1166. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, young animals, colostral immunity, assessment, age differences, gamma glutamyltransferase, blood serum, enzyme activity, IgG, algorithms, stepwise regression. failure of passive transfer.

Jonsson, N.N.; Rozmanec, M. **Tick paralysis and hepatic lipidosis in a llama**. *Australian Veterinary Journal*. Apr. 1997; 75(4): 250-253. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: llamas, tick paralysis, *Ixodes holocyclus*, envenomation, lipidosis, clinical aspects, pathology, postmortem examinations, energy metabolism, case reports.

Konkle, D.M.; Nelson, K.M.; Lunn, D.P. **Nonsocomial transmission of *Cryptosporidium* in a veterinary hospital**. *Journal of Veterinary Internal Medicine*. Nov/Dec 1997; 11 (6): 340-343. ISSN: 0891-6640.

NAL call no.: SF601.J65

Descriptors: calves, foals, llamas, cryptosporidiosis, case reports, nosocomial infections, veterinarians, *Cryptosporidium parvum*, diarrhea, horizontal transmission, Wisconsin.

Llama Banner Presents Jewels of...: Herdshire Reference Manual. Llama Banner, [Manhattan, Kan.], 1997. v.: ill.

NAL call no.: SF401.L6L553

Descriptors: llamas, llamas breeding, United States periodical.

Leguia-Puente, G. **Acute and subacute fasciolosis of alpacas (*Lama pacos*) and treatment with triclabendazole.** *Tropical Animal Health and Production*. Feb 1997; 29(1): 31-32. ISSN: 0049-4747.

NAL call no.: SF601.T7

Descriptors: alpacas, triclabendazole, drug efficacy.

Lillich, J.D.; Anderson, D.E. **Facilitated ankylosis for treatment of septic arthritis of the distal interphalangeal joint in a llama.** *Australian Veterinary Journal*. Sept 1997; 75(9): 636-638. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: llamas, septic arthritis, wounds, joint disease, phalanges, treatment, case reports.

Lin, H.C.; Baird, A.N.; Pugh, D.G.; Anderson, D.E.; Gaughan, E.M. **Effects of carbon dioxide insufflation combined with changes in body position on blood gas and acid-base status in anesthetized llamas (*Lama glama*).** *Veterinary Surgery*. Sept/Oct 1997; 26(5): 444-450. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: llamas, laparoscopy, anesthesia, carbon dioxide, position, blood gases, acid base equilibrium, gas exchange, xylazine, ketamine, halothane.

Long, P.O. **The birth of a healthy llama.** *Equine Practice*. Jan 1997; 19(1): 14-15. ISSN: 0162-8941.

NAL call no.: SF951.E62

Descriptors: llamas, pregnancy, parturition, animal health, dystocia, uterine torsion.

Martinez, Z.; Iniguez, L.C.; Rodriguez, T. **Influence of effects on quality traits and relationships between traits of the llama fleece.** *Small Ruminant Research*. Apr 1997; 24(3): 203-212. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: llamas, fleece, fiber quality, diameter, medullation, age differences, color, representative sampling, staple, undercoat, sex differences, fleece weight, crimp, body weight, guard hairs, kemp.

Mattoon, J.S.; Gerros, T.C.; Parker, J.E.; Carter, C.A.; Lamarche, R.M. **Upper airway obstruction in a llama caused by aberrant nasopharyngeal bots (*Cephenemyia* sp.).** *Veterinary Radiology & Ultrasound*. Sept/Oct 1997; 38(5): 384-386. ISSN: 1058-8183.

NAL call no.: SF757.8.A4

Descriptors: llamas, blockage, nasopharynx, respiratory diseases, *Cephenemyia*, parasitoses, diagnosis, radiography, ivermectin, drug therapy, case reports.

Memon, M.A.; Stevens, D.K. **Termination of unwanted pregnancy in a llama with cloprostenol and subsequent pregnancy: a case report.** *Theriogenology*. Feb 1997; 47(3): 615-618. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, induced abortion, cloprostenol, blood serum, progesterone, female, fertility, case report.

Abstract: A 5 yr old female llama was presented by its owner for an elective abortion. The llama was accidentally bred to an unknown, and possibly related, male about 2.5 mo prior to presentation. The pregnancy was first confirmed by ultrasonography then cloprostenol (150 micrograms im) was administered once. Cloprostenol, an analogue of prostaglandin F2 alpha, was chosen in preference to natural PGF2 alpha due to reported adverse reactions in llamas to this abortifacient. Blood serum progesterone levels decreased rapidly from 5.7 to < 0.2 ng/ml at 0 to 60 h post injection, respectively. The aborted fetus was expelled at approximately 108 h after the injection. Twenty days post abortion the llama was rebred. At 27 and 87 d post breeding, pregnancy was indicated first by male refusal and then by elevated serum progesterone concentrations and was confirmed by ultrasonography. Following a 355 d gestation period, a male cria was born. This case provides evidence that an abortion can be induced with cloprostenol without an adverse effect on future fertility in the llama.

Namken, J.C. **On 'top' of the world: Bolivian co-op helps producers improve & market alpaca fiber.** *Rural Cooperatives*. Nov/Dec 1997; 64(6): 16-21, 28 ISSN: 1088-8845.

NAL call no.: aHD1491.U6R87

Descriptors: alpacas, cooperative activities, fiber markets, Bolivia.

National Geographic Television. ***Spitting Mad: Guanacos of South America***. 1997. National Geographic Society Television and Films, Washington, DC. Note: William L. Franklin was a Scientific Consultant for this video.

Descriptors: guanacos, general descriptions, historical information, behavior, habitat, life history, national wildlife resource, role in lives of indigenous people, value of fiber.

Rae, M. **Alpacas: wooly & wonderful**. *Small Farm Today*. Feb/Mar 1997; 14(1): 27. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: alpacas, livestock enterprises, small farms.

Rogers, K.; Barrington, G.M.; Parish, S.M. **Squamous cell carcinoma originating from a cutaneous scar in a llama**. *Canadian Veterinary Journal*. Oct 1997; 38(10): 643-644. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: llamas, scars, carcinoma, skin, wounds, healing, metastasis, case reports, nonhealing wounds.

Russel, A.J.F.; Redden, H.L. **The effect of nutrition on fibre growth in the alpaca**. *Animal Science*. June 1997; 64(pt.3): 509-512. ISSN: 1357-7298.

NAL call no.: SF1.A56

Descriptors: alpacas, animal fibers, growth, fiber quality, plane of nutrition, fiber weight, length and diameter.

Russel, Marion. **Value-Added Processing of Alpaca Fibre**. Saskatchewan Agriculture and Food, [Saskatchewan]. [1997] 2 p.

NAL call no.: HD9904.C23 S27 1997

Descriptors: woolen goods industry, Saskatchewan, alpacas, textiles, Canada.

Sands, J.D. **Alpacas: attractive investment attractive lifestyle**. *AgVentures*. June/July 1997; [1(1)?]: 28-32.

NAL call no.: S441.A475

Descriptors: alpacas, livestock farming.

Sartin, E.A.; Waldrige, B.M.; Carter, D.W.; Herrera, G.A.; Toivio-Kinnucan, M.; Lenz, S.D.; Pugh, D.G.; Wolfe, D.F.; Sundberg, J.P. **Gastric squamous cell carcinoma in three llamas**. *Journal of Veterinary Diagnostic Investigation*. Jan 1997; 9(1): 103-106. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, carcinoma, stomach, stomach mucosa, metastasis, symptoms, histopathology, case reports, Alabama.

Van Hoogmoed, L.; Snyder, J.R.; Roberts, G.; Harmon, F.A. **Unilateral nephrectomy in a juvenile llama**. *Veterinary Surgery*. Nov/Dec 1997; 26(6): 497-501. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: llamas, nephrectomy, ectopia, ureter, clinical aspects, computed tomography, diagnostic value, diagnosis, surgery, case reports.

Waldrige, B.M.; Pugh, D.G. **Reproductive techniques in female lamoids**. *Veterinary Medicine*. July 1997; 92(7): 651-652, 654. ISSN: 8750-7943.

NAL call no.: 41.8 M69

Descriptors: llamas, alpacas, female animals, ultrasonography, pregnancy diagnosis, biopsy, uterus, culture techniques, diagnostic techniques, uterine lavage.

Waldrige, B.M.; Lin, H.C.; DeGraves, F.J.; Pugh, D.G. **Sedative effects of medetomidine and its reversal by atipamezole in llamas**. *Journal of the American Veterinary Medical Association*. Dec 15, 1997; 211(12): 1562-1565. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, medetomidine, narcotic antagonists, drug effects, drug antagonism, efficacy, dosage, anesthesia, blood gases, heart rate, respiration rate, adverse effects, sedation.

Welles, E.G.; Pugh, D.G.; Wenzel, J.G.W.; Waldrige, B.; Hanson, R. **Liver biopsy in llamas**. *Equine Practice*. Mar

1997; 19(3): 24-28. ISSN: 0162-8941.

NAL call no.: SF951.E62

Descriptors: llamas, liver, biopsy, safety.

Wheeler, J.C.; Hoces, R.D. **Community participation, sustainable use, and vicuna conservation in Peru.** *Mountain Research and Development*. Aug 1997; 17(3): 283-287. ISSN: 0276-4741.

NAL call no.: GB500.M68

Descriptors: vicuna, natural resource management, wildlife conservation, Peru.

1996

Anderson, Barbara Norris. **Llama Babies: Up, Dry, and Nursing.** A+ Llamas, Salem, OR. c1996. 183 p., ill. ISBN: 0965479102.

NAL call no.: SF401.L6A54 1996

Descriptors: llamas, newborn care, infancy, parturition, Oregon, anecdotes

Anderson, D.E.; Gaughan, E.M.; Baird, A.N.; Lin, H.C.; Pugh, D.G. **Laparoscopic surgical approach and anatomy of the abdomen in llamas.** *Journal of the American Veterinary Medical Association*. Jan 1, 1996; 208(1): 111-116. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, laparoscopy, animal anatomy, abdomen.

Beck, C.; Dart, A.J.; Collins, M.B.; Hodgson, D.R.; Parbery, J. **Polioencephalomalacia in two alpacas.** *Australian Veterinary Journal*. Nov 1996; 74(5): 350-352. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, polioencephalomalacia, clinical aspects, symptoms, treatment, postmortem examinations, case reports.

Bedford, S.J.; Hawes, M.; Paradis, M.R.; Mort, J.D.; Hinrichs, K. **Peritonitis associated with passage of the placenta into the abdominal cavity in a llama.** *Journal of the American Veterinary Medical Association*. Dec 1, 1996; 209(11): 1914-1916. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, peritonitis, placental retention, placenta, abdomen, wounds, vagina, dystocia, case reports.

Belcher, S. **Llamas are fun.** *Small Farm Today*. Oct/Nov 1996; 13(5): 20-23. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, alternative livestock enterprises, small farms, exotic animals.

Bravo, P.W.; Stewart, D.R.; Lasley, B.L.; Fowler, M.E. **Hormonal indicators of pregnancy in llamas and alpacas.** *Journal of the American Veterinary Medical Association*. June 15, 1996; 208(12): 2027-2030. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, pregnancy diagnosis, estrone, blood serum, urine, relaxin, progesterone.

Bravo, P.W.; Bazan, P.J.; Troedsson, M.H.T. ; Villalta, P.R.; Garnica, J.P. **Induction of parturition in alpacas and subsequent survival of neonates.** *Journal of the American Veterinary Medical Association*. Nov 15, 1996; 209(10): 1760-1762. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: alpacas, newborn animals, survival, viability, parturition, induction, dexamethasone, oxytocin, prostaglandins, dosage effects, estrone, progesterone, blood plasma, urine, fetal death.

Cafrune, M.M.; Rebuffi, G.E.; Gaido, A.B.; Aguirre, D.H. **Fasciola hepatica in semi-captive vicunas (*Vicugna vicugna*) in north west Argentina.** *Veterinary Record* (London). July 27, 1996; 139(4): 97. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: vicunas, *Fasciola hepatica*, feces, parasitism, rectum, infestation, helminth ova in feces, symptoms,

disease prevalence, semi-captive animals, Argentina.

Carraro, D.B.; Dart, A.J.; Hudson, N.P.H.; Dart, C.M.; Hodgson, D.R. **Surgical correction of anorectal atresia and rectovaginal fistula in an alpaca cria.** *Australian Veterinary Journal.* Nov 1996; 74(5): 352-354. ISSN: 0005-0423.
NAL call no.: 41.8 Au72

Descriptors: alpacas, anorectal atresia, fistula, surgery, young animals, case reports.

Carter, Berry. **Llama: Down Under: Alpaca, Llama, Guanaco, Vicuna.** Agmedia, East Melbourne. c1996. viii, 151 p., [4] p. of plates, ill. (some col.). ISBN: 0730665607.

NAL call no.: QL737.U54C37 1996

Descriptors: llamas, guanaco, alpaca, vicuna, animal production, Australia.

Cebra, C.K.; Cebra, M.L.; Garry, F.B.; Belknap, E.B. **Forestomach acidosis in six New World camelids.** *Journal of the American Veterinary Medical Association.* Mar 15, 1996; 208(6): 901-904. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, acidosis, forestomach, symptoms, diagnosis, treatment, feed grains, case reports.

Cebra, C.K.; Garry, F.B.; Cebra, M.L. **Tick paralysis in eight New World camelids.** *Veterinary Medicine.* July 1996; 91(7): 673-676. ISSN: 8750-7943.

NAL call no.: 41.8 M69

Descriptors: llamas, alpacas, tick paralysis, *Dermacentor*, symptoms, diagnosis, treatment, case reports, Colorado, South Dakota.

Cebra, M.L.; Cebra, C.K.; Garry, F.B. **Tooth root abscesses in New World camelids: 23 cases (1972-1994).** *Journal of the American Veterinary Medical Association.* Aug 15, 1996; 209(4): 819-822. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, tooth diseases, abscesses, symptoms, medical treatment, surgery, prognosis, case reports.

Chauvet, A.E.; Shelton, G.D.; Darien, B.J. **Vitamin E deficiency associated with myopathy in a llama.** *Progress in Veterinary Neurology.* 1996; 7(4): 149-152. ISSN: 1061-575X.

NAL call no.: SF895.P76

Descriptors: llamas, vitamin deficiencies, vitamin E, polymyositis, symptoms, diagnosis, treatment, case reports.

Christensen, J.M.; Smith, B.B.; Murdane, S.B.; Hollingshead, N. **The disposition of five therapeutically important antimicrobial agents in llamas.** *Journal of Veterinary Pharmacology and Therapeutics.* Dec 1996; 19(6): 431-438. ISSN: 0140-7783.

NAL call no.: SF915.J63

Descriptors: llamas, ampicillin, tobramycin, trimethoprim, sulfamethoxazole, enrofloxacin, cephalosporins, intravenous injection, pharmacokinetics, dosage, drug excretion, ceftiofur.

Christopher, M.M.; Belknap, E.B.; Meyer, D.J.; Lackey, M.N.; Vap, L.M. **Comparison of methods for sodium and potassium determination in llama urine.** *American Journal of Veterinary Research.* Jan 1996; 57(1): 5-30. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, urine, sodium, potassium, flame photometry, atomic absorption spectrophotometry, analytical methods, comparison studies, indirect ion selective electrode potentiometry, direct ion selective electrode potentiometry.

Campo, M.R. del; Campo, C.H. del; Ginther, O.J. **Vascular provisions for a local utero-ovarian cross-over pathway in New World camelids.** *Theriogenology.* Oct 15, 1996; 46 (6): 983-991. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: alpacas, llamas, females, uterus, ovaries, luteolysis, venous circulation, pregnancy, veins, arteries, oviducts, ovarian circulation.

Abstract: The right uterine horn of alpacas causes luteolysis in the right ovary, whereas the left horn causes luteolysis in both ovaries. Female reproductive tracts were studied in 32 adult llamas, 12 adult alpacas, and 21 mid-gestation

female fetuses to determine if there is a dichotomy in the vascular anatomy between the 2 sides. Adult tracts were studied by either injection of colored latex into the veins and arteries followed by tissue clearing or by injection of colored fluids during transillumination. Fetal uteri were studied by transillumination. The angioarchitecture of the ovarian vascular pedicle was similar to that reported for ewes. There was no vessel comparable to the middle uterine artery, which is the largest uterine artery in the other farm species. A striking difference from the uterine vascular of other farm species was the presence of a major branch of the right uterine artery that crossed the cranial intercornual area to supply much of the left uterine horn. A corresponding major vein originated from the left horn, crossed the mid-line, and terminated as a branch of the right uterine vein. Thus, the vascular anatomy indicated that much venous blood from the left horn drained to the right side. This was confirmed by injection of colored fluid into a small venous branch at the tip of the left horn. The prominent cross-over vessels were observed in the fetal uteri, and the diameter of the left uterine fetal horn (6.7 +/ - 0.6 mm) was greater (p<0.001) than the diameter of the right horn (5.8 +/ - 0.5 mm). The presence of a large cross-over vein traversing from the left horn to the right side is compatible with the hypothesis that the left horn can exert luteolytic control over the corpus luteum in the right ovary through a veno-arterial pathway. The area of veno-arterial transfer of the luteolysin from a vein containing blood from the left horn into an artery supplying the right ovary was not defined in this study. However, the results provide an anatomical basis for functional testing of the cross-over hypothesis and defining the area of venoarterial transfer in camelids.

Dart, A.J.; Kinde, H.; Hodgson, D.R.; Peauroi, J.R.; Selby, A.W.; Maas, J.; Fowler, M.E. **Serum alpha-tocopherol, vitamin A, and blood selenium concentrations, and glutathione peroxidase activity in llamas fed alfalfa hay.** *American Journal of Veterinary Research.* May 1996; 57(5): 689-692. ISSN: 0002-9645
NAL call no.: 41.8 Am3A.

Descriptors: llamas, alfalfa hay, ruminant feeding, alpha tocopherol, retinol, precursors, selenium, blood serum, vitamin A, glutathione peroxidase, enzyme activity.

Davis, I.A.; McGaffin, J.R.; Kuchinka, G.D. **Intravenous catheterization of the external jugular vein in llamas.** *Compendium on Continuing Education for the Practicing Veterinarian.* Mar 1996; 18(3): 330-336. ISSN: 0193-1903.
NAL call no.: SF601.C66

Descriptors: llamas, jugular vein, catheterization, catheters.

Dowling, P.M.; Ferguson, J.G.; Gibney, R.F. **Pharmacokinetics of gentamicin in llamas.** *Journal of Veterinary Pharmacology and Therapeutics.* Apr 1996; 19(2): 161-163. ISSN: 0140-7783.
NAL call no.: SF915.J63

Descriptors: llamas, gentamicin, pharmacokinetics, drug toxicity, nephrotoxicity, dosage.

Ferguson, J. **Bone sequestration and treatment of pathological fractures in llamas.** *Proceedings of the North American Veterinary Conference.* 1996; 10: 668. Note: Meeting held Jan. 13-17, 1996, Orlando, Florida.
NAL call no.: SF605.N672

Descriptors: llamas, bone fractures, treatment.

Fisher, D.J.; Zinkl, J.G. **Eperythrozoonosis in a one-day-old llama.** *Veterinary Clinical Pathology.* 1996; 25(3): 93-94. ISSN: 0275-6382.
NAL call no.: SF601.A54

Descriptors: llamas, newborn animals, eperythrozoon, case reports, transplacental transmission.

Gasthuys, F.; Steenhaut, M.; Martens, A. **Ostectomy for congenital flexural deformity of the metacarpophalangeal joints in a llama.** *Veterinary Comparative Orthopaedics and Traumatology.* Feb 1996; 9(1): 40-42. ISSN: 0932-0814.
NAL call no.: SF910.5.V4

Descriptors: llamas, newborn animals, metacarpus, joints animal, deformities, surgical operations, case reports.

Goodchild, L.M.; Dart, A.J.; Collins, M.B.; Dart, C.M.; Hodgson, J.L.; Hodgson, D.R. **Cryptococcal meningitis in an alpaca.** *Australian Veterinary Journal.* Dec 1996; 74(6): 428-430. ISSN: 0005-0423.
NAL call no.: 41.8 Au72

Descriptors: llamas, *Cryptococcus neoformans* var. *gattii*, cryptococcal meningitis, symptoms, diagnosis, treatment, case reports.

Green, R.S.; Douch, P.G.C.; Hill, F.I.; Death, A.F.; Wyeth, T.K.; Donaghy, M.J. **Antibody responses of grazing alpacas (*Lama pacos*) in New Zealand to intestinal nematodes.** *International Journal of Parasitology*. Apr 1996; 26(4): 429-435. ISSN: 0020-7519.

NAL call no.: QH547.I55

Descriptors: alpacas, nematode infections, *Teladorsagia circumcincta*, *Cooperia curticei*, *Trichostrongylus colubriformis*, antibody formation, humoral immunity, helminth ova, feces, excretory secretory products, somatic antigens, liveweight, fleece weight, New Zealand, fecal egg count.

Abstract: Alpaca (*Lama pacos*) were grazed for 10 months (October 1992-June 1993) on pasture with sheep or on pasture which had been recently grazed by sheep. The alpaca, of various age groups, totalled 94 at the beginning of the experiment and during the course of the experiment 32 progeny (cria) were born, 10 in spring 1992 and 22 in autumn 1993. Serum levels of specific antibodies to excretory/secretory antigens of the third larval stage (L3) of (*Cooperia curticei*, *Ostertagia circumcincta* or *Trichostrongylus colubriformis* and somatic antigens from adult *T. colubriformis* were determined at monthly intervals by ELISA. Faecal egg count and live-weight were determined monthly and fleece-weight was measured at shearing. Three days after the birth of the cria, serum antibody levels ranged from 0.46-0.85 optical density units for the L3 antigens and averaged 0.22 for the adult *T. colubriformis* antigen. These levels declined to 0.1-0.24 and 0.06 respectively by 2-3 months of age. Subsequently, antibody levels increased steadily to reach maximal adult levels at approximately 23-26 months. Antibody levels were negatively correlated with FEC, but positively correlated with live-weight at 7 months although at 15 months antibodies and live-weight were negatively correlated. A positive correlation was found between weight and FEC. Fleece-weight showed no correlation with antibody level, a positive correlation with weight and a negative correlation with FEC. The relationships among antibody responses, FEC, live-weight and fleece-weight observed for alpaca in this experiment suggest that antibody responses might provide a useful indicator of alpaca immuno-responsiveness and has potential for use as a parameter for selection of alpaca with reduced FEC.

Hathcock, J.T.; Pugh, D.G.; Cartee, R.E.; Hammond, L. **Computed tomography of the llama head: technique and normal anatomy.** *Veterinary Radiology & Ultrasound*. July/Aug 1996; 36(4): 290-296. ISSN: 1058-8183.

NAL call no.: SF757.8.A4

Descriptors: llamas, computed tomography, head structure, brain.

Hoffmann, Clare.; Asmus, Ingrid. **Caring for Llamas & Alpacas: a Health and Management Guide.** 2nd ed. March 1996. Rocky Mountain Llama and Alpaca Association, Monte Vista, CO. [1996] 171 p., ill. ISBN: 0962276820.

NAL call no.: SF401.L6H64 1996

Descriptors: llamas health handbooks, manuals, production management.

Ingram, Gwen. **The Waldo Chronicles: a Training Log.** Lost Creek Llamaprints, Dexter, OR. c1996. vii, 92 p., ill. ISBN: 096521821X.

NAL call no.: SF459.L52I54 1996

Descriptors: llamas, training.

Kaneps, A.J. **Orthopedic conditions of small ruminants--llama, sheep, goat, and deer.** *Veterinary Clinics of North America. Food Animal Practice. Advances in Ruminant Orthopedics*. 1996; 12(1): 211-231. ISSN: 0749-0720.

NAL call no.: SF601.V535 v.12, no.1

Descriptors: llamas, sheep, goats, deer, bone fractures, feet, sepsis, arthritis, congenital abnormalities, tendons, rupture, foot rot, fibroma.

Lackey, M.N.; Belknap, E.B.; Greco, D.S.; Fettman, M.J. **Single intravenous and multiple dose pharmacokinetics of gentamicin in healthy llamas.** *American Journal of Veterinary Research*. Aug 1996; 57(8): 1193-1199. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, gentamicin, pharmacokinetics, intravenous injection, intramuscular injection, dosage, drug therapy, renal function, nephrotoxicity, male animals.

Lemosquet, S.; Dardillat, C.; Jailler, M.; Dulphy, J.P. **Voluntary intake and gastric digestion of two hays by llamas and sheep: influence of concentrate supplementation.** *Journal of Agricultural Science*. Dec 1996; 127(pt. 4): 539-

548. ISSN: 0021-8596.

NAL call no.: 10 J822

Descriptors: sheep, llamas, adaptation, feed intake, measurement, rumen fermentation, osmotic pressure, pH, nutrient retention, cellulose digestion, digestibility, feed evaluation, hay, plant composition, nitrogen content, feed supplements, barley, *Dactylis glomerata*, France.

Lichtenwalner, A.B.; Woods, G.L.; Weber, J.A. **Ejaculatory pattern of llamas during copulation.** *Theriogenology*. July 15, 1996; 46(2): 285-291. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, ejaculation, copulation, natural mating, urethra, muscle contraction, strain, pelvic thrusts.

Abstract: The objective of this study was to use transrectal digital palpation of urethral pulses to define the ejaculatory pattern of llamas during copulation. Five male llamas were palpated during 5 to 6 copulations each with receptive female llamas (n = 28 copulations). The time from first exposure of a male to a female until mounting was 0.7 +/- 1.4 min (mean +/- SD), time to the first intromission was 1.7 +/- 1.4 min, and time from initial mount to final dismount (copulation duration) was 21.7 +/- 7.8 min. A total of 121.9 +/- 61.0 urethral pulses per copulation (5.6 +/- 1.7 pulses/min) was palpated. During the first 3.9 +/- 3.7 min of copulation urethral pulses (11.0 +/- 10.1 urethral pulses at 3.5 +/- 2.5 pulses/min) occurred randomly and were not associated with whole-body strains. After the first 4 min of copulation, urethral pulses occurred in a pattern of clusters of frequent urethral pulses associated with whole-body strains, alternating with intercluster intervals of infrequent urethral pulses without whole-body strains. Individual clusters were characterized by 4.3 +/- 2.7 urethral pulses at 16.7 +/- 4.5 pulses/min during strains and intercluster intervals were characterized by 1.7 +/- 2.3 urethral pulses at 2.2 +/- 1.8 pulses/min. Each cluster of urethral pulses during a strain was preceded by 2.3 +/- 1.8 repositions of the male's hindlegs and by 38.1 +/- 20.8 pelvic thrusts. There were 18.5 +/- 10.6 clusters of urethral pulses accompanied by strains per copulation at 0.9 +/- 0.3 clusters/min. The 18 to 19 clusters of urethral pulses appeared to be individual ejaculations. Therefore, we hypothesize that llamas ejaculated 18 to 19 times during their 22-min copulations.

Lichtenwalner, A.B.; Woods, G.L.; Weber, J.A. **Seminal collection, seminal characteristics and pattern of ejaculation in llamas.** *Theriogenology*. July 15, 1996; 46(2): 293-305. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, semen production, artificial vagina, copulation, semen characters, ejaculate volume, ph, spermatozoa, motility, morphology, abnormalities.

Abstract: Semen was collected from 10/10 llamas during 26/30 (87%) collection attempts using an artificial vagina mounted inside a surrogate female. For the 26 semen collections, the duration of copulation (mount to dismount) with the artificial vagina was 31.7 +/- 12.0 min (mean +/- SD). Seminal pH was 8.1 +/- 1.1, and seminal volume per collection was 3.0 +/- 1.9 ml. Sperm concentration per collection was 1.0 +/- 0.8 X 10(6) sperm/ml, total number of spermatozoa was 2.9 +/- 3.1 X 10(6), total sperm motility was 23.7 +/- 20.0%, and the percentage of morphologically normal spermatozoa was 39.7 +/- 18.5%. Morphologically abnormal spermatozoa were categorized according to abnormal heads (20.1 +/- 19.9%), tail-less heads (8.7 +/- 8.9%), abnormal acrosomes (12.9 +/- 12.4%), abnormal midpieces (1.0 +/- 3.7%), cytoplasmic droplets (11.1 +/- 12.4%), and abnormal tails (6.6 +/- 12.0%). There were 0.3 +/- 0.3 million motile, morphologically normal spermatozoa per collection: less than 1000 during the first 5 min of copulation, 0.01 +/- 0.01 X 10(6) between 5 and 10 min of copulation, 0.04 +/- 0.08 X 10(6) between 10 and 15 min of copulation, 0.09 +/- 0.21 X 10(6) between 15 and 20 min of copulation, and 0.15 +/- 0.28 X 10(6) between 20 min and the end of copulation.

Lucherini, M. **Group size, spatial segregation and activity of wild sympatric vicunas *Vicugna vicugna* and guanacos, *Lama guanicoe*.** *Small Ruminant Research*. May 15, 1996; 20(3): 193-198. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: vicuna, wild animals, guanacos, high altitude, sympatric species, physical activity, group size, slope, diurnal activity, foraging, arid regions, Argentina.

Malone, E.; Roertgen, K.; Kobluk, C. **Anaplastic sarcoma of the mandible in a llama.** *Canadian Veterinary Journal*. July 1996; 37(7): 426-428. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: llamas, mandible, sarcoma, symptoms, postmortem examinations, wounds, case reports.

Moraga, F.; Monge, C.; Riquelme, R.; Llanos, A.J. **Fetal and maternal blood oxygen affinity: a comparative study in llamas and sheep.** *Comparative Biochemistry and Physiology. Part A, Physiology.* Oct 1996; 115A (2): 111-115.

NAL call no.: QP1.C6

Descriptors: llamas, sheep, fetus, dams, mothers, pregnancy, blood oxygen affinity, hemoglobin, high altitude, altitude, comparisons, low altitude.

Abstract: We compared blood oxygen affinity (P50) and hemoglobin concentration among fetal and maternal llamas and sheep, as respective examples of species native to high and low altitudes. P50, hemoglobin concentration and blood oxygen content were determined at sea level in 16 pregnant llamas, 6 pregnant sheep and their respective fetuses. P50 was similar in fetal llamas and sheep, but maternal llamas had higher blood oxygen affinity than maternal sheep. As a consequence, the P50 difference between mother and fetus was less in llamas than in sheep. Fetal llamas had higher hemoglobin concentrations than fetal sheep. In contrast, the maternal hemoglobin concentrations were similar. The blood oxygen content was higher in fetal and maternal llamas than in fetal and maternal sheep. We conclude that the llama, a species native to the altiplano, has a higher blood oxygen content than the sheep, as determined in the fetus by a high hemoglobin concentration and in the mother by a low P50.

Morvan, B.; Bonnemoy, F.; Fonty, G.; Gouet, P. **Quantitative determination of H₂-utilizing acetogenic and sulfate-reducing bacteria and methanogenic archaea from digestive tract of different mammals.** *Current Microbiology.*

Mar 1996; 32(3): 129-133. ISSN: 0343-8651.

NAL call no.: QR1.C78

Descriptors: sheep, cattle, buffaloes, deer, llamas, horses, herbivores, rumen, cecum, rumen bacteria, intestinal microorganisms, cellulolytic microorganisms, sulfate reducing bacteria, quantitative analysis, acetogenic bacteria, hydrogenotrophic microorganisms.

Abstract: Total number of bacteria, cellulolytic bacteria, and H₂-utilizing microbial populations (methanogenic archaea, acetogenic and sulfate-reducing bacteria) were enumerated in fresh rumen samples from sheep, cattle, buffaloes, deer, llamas, and caecal samples from horses. Methanogens and sulfate reducers were found in all samples, whereas acetogens were not detected in some samples of each animal. *Archaea methanogens* were the largest H₂-utilizing populations in all animals, and a correlation was observed between the numbers of methanogens and those of cellulolytic microorganisms. Higher counts of acetogens were found in horses and llamas (1 X 10⁴) and 4 X 10⁴ cells ml⁻¹ respectively).

O'Brien, R.T. **Intraoral dental radiography: experimental study and clinical use in two horses and a llama.**

Veterinary Radiology & Ultrasound. Nov/Dec 1996; 37(6): 412-416. ISSN: 1058-8183.

NAL call no.: SF757.8.A4

Descriptors: horses, llamas, teeth, radiography, tooth diseases, case reports.

Perkins, N.R.; Frazer, G.S.; Hull, B.L. **Endocrine diagnosis of cryptorchidism in a llama.** *Australian Veterinary Journal.* Oct 1996; 74(4): 275-277. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: llamas, cryptorchidism, diagnostic techniques, hcg, testosterone, surgical operations, testes, case reports.

Rodriguez, Lopez; Yofre, Julian. **Andean Technology in Camelidae Production.** Centro de Educacion y Promocion "Kantu", Cajamarca [Peru]. [1996] 179 p., ill., map

NAL call no.: SF401.L35R63 1996

Descriptors: *Lama* species, vicuna, llamas, alpaca, guanaco, livestock production methods, Peru.

Rowan, L.L.; Morin, D.E.; Hurley, W.L.; Shanks, R.D.; Kakoma, I.; Hoffmann, W.E.; Goetz, T.E.; Cullor, J.S.

Evaluation of udder health and mastitis in llamas. *Journal of the American Veterinary Medical Association.* Oct 15, 1996; 209(8): 1457-1463. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, mammary gland diseases, inflammation, udders, pathogens, bacteria, milk, disease prevalence, ph, somatic cell count, California mastitis test, n-acetyl-beta glucosaminidase, enzyme activity, diagnostic value.

Sarno, R.J.; Hunter, R.L.; Franklin, W.L. **Immobilization of guanacos by use of Tiletamine/Zolazepam.** *Journal of the American Veterinary Medical Association.* 1996; 208(3): 408-409.

NAL call no.: 41.8 AM3

Descriptors: guanacos, chemical restraint, drug combination, Tiletamine/Zolazepam, immobilization techniques, dosages, recovery.

Scarratt, W.K.; Karzenski, S.S.; Wallace, M.A.; Crisman, M.V.; Saunders, G.K.; Cordes, D.O.; Sponenberg, D.P.

Suspected parelaphostrongylosis in five llamas. *Progress in Veterinary Neurology*. 1996; 7(4): 124-129. ISSN: 1061-575X.

NAL call no.: SF895.P76

Descriptors: llamas, *Parelaphostrongylus*, nematode infections, symptoms, diagnosis, treatment, prognosis, histopathology, case reports.

Smith, Bradford B.; Timm, Karen L.; Long, Patrick O. *Llama and Alpaca Neonatal Care*. 1st ed. Clay Press, Jackson, Calif. 1996. 112 p., ill. ISBN: 0964661837.

NAL call no.: SF401.L6S65 1996

Descriptors: llamas, alpaca, veterinary neonatology, newborn care.

Snowmass Alpacas (Firm). *Snowmass Alpacas Presents*. [Snowmass Alpacas, Snowmass, CO. 1996?] [12] p., chiefly col. ill.

NAL call no.: SF401.A4S66 1996

Descriptors: alpaca, breeding, textiles.

Tsur, I.; Harmelin, A.; Dvir, I.; Yanai, J. **Meningoencephalitis and brain abscessation due to *Escherichia coli* in a 2 week old alpaca cria.** *Australian Veterinary Journal*. Dec 1996; 74 (6): 437-438. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, meningoencephalitis, brain, abscesses, *Escherichia coli*, atypical course, colostrum immunity, young animals, case reports.

Tyler, J.W.; Petersen, A.; Ginsky, J.; Parish, S.; Besser, T.; Leathers, C.; Beyer, J. ***Clostridial myonecrosis, hepatitis, and nephritis in a llama with vegetative endocarditis.*** *Journal of Veterinary Internal Medicine*. Mar/Apr 1996; 10(2): 94-96. ISSN: 0891-6640.

NAL call no.: SF601.J65

Descriptors: llamas, endocarditis, hepatitis, nephritis, lameness, *Clostridium perfringens*, death, medical treatment, postmortem examinations, case reports, necroses, bacterial diseases, *Bacteroides fragilis*.

Van Hoogmoed, L.; Snyder, J.R.; Stover, S.M.; Drake, C.; Taylor, K.; Harmon, F.A.; McDuffee, L. **In vitro biomechanical comparison of the strength of the linea alba of the llama, using two suture patterns.** *American Journal of Veterinary Research*. June 1996; 57(6): 938-942. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, abdomen, suture techniques, sutures, breaking strength, position, in vitro, simple continuous suture pattern, inverted cruciate suture pattern.

Van Saun, R.J.; Smith, B.B.; Watrous, B.J. **Evaluation of vitamin D status of llamas and alpacas with hypophosphatemic rickets.** *Journal of the American Veterinary Medical Association*. Sept 15, 1996; 209(6): 1128-1133. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, 25 hydroxyergocalciferol, calcium, inorganic phosphorus, blood, nutritional state, hypophosphatemic rickets, age differences, sex differences, species differences, seasonal variation, Oregon, California.

Williams, L. **Promoting llamas.** *Small Farm Today*. Feb 1996; 13(1): 34-35. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, animal husbandry, small farms, ancillary enterprises, marketing channels, Pennsylvania.

1995

Adolfo-Canedi, Arturo; Universidad Nacional de Jujuy, Instituto Nacional de Tecnologia Agropecuaria (Argentina). **Bioecology and Sustainable Use of Vicuna in Jujuy Province, Argentina.** Universidad Nacional de Jujuy: Instituto Nacional de Tecnologia Agropecuaria, Jujuy [Argentina]. [1995] 111 p., ill. (some col.), maps.

NAL call no.: SF401.V5B56 1995

Descriptors: vicunas, natural resource management, Argentina.

Afshar, A.; Heckert, R.A.; Dulac, G.C.; Trotter, H.C.; Myers, D.J. **Application of a competitive ELISA for the detection of bluetongue virus antibodies in llamas and wild ruminants.** *Journal of Wildlife Diseases.* July 1995; 31(3): 327-330. ISSN: 0090-3558.

NAL call no.: 41.9 W64B

Descriptors: llamas, bluetongue virus, antibody formation, blood serum, ELISA, *Cervus elaphus canadensis*, elk, bison, reindeer, *Odocoileus virginianus*, white tailed deer, *Alces alces*, moose, *Ovibos moschatus*, yaks.

Alpacas Magazine. Alpaca Owners and Breeders Association, Estes Park, CO. c1995, v.: ill.

NAL call no.: SF401.A4 A57

Descriptors: alpaca periodicals, articles, care and management.

Andrews, A.L.; Rawlinson, R.J.; Rasis, A.L.; Hodgson, D.R. **Suspected traumatic rupture of the urinary bladder in an alpaca.** *Australian Veterinary Journal.* Feb 1995; 72(2): 73-75. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, bladder rupture, trauma, symptoms, diagnosis, treatment, case report.

Anonymous. **Alpacas: the huggable investment.** *Small Farm Today.* Aug 1995; 12(4): 30-31. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: alpacas, alternative livestock farming, small farms.

Anonymous. **Care of llamas.** *Equine Practice.* Oct 1995; 17(9): 31-34. ISSN: 0162-8941.

NAL call no.: SF951.E62

Descriptors: llamas, animal husbandry, animal health.

Barrington, G.M.; Parish, S.M. **Tick paralysis in two llamas.** *Journal of the American Veterinary Medical Association.* Aug 15, 1995; 207(4): 476-477. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, tick paralysis, *Dermacentor andersoni*, toxins, symptoms, diagnosis, treatment, case reports.

Borchard, H. **Guard llamas.** *Small Farm Today.* Feb 1995; 12(1): 32-33. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: llamas, sheep flock guard animals.

Bourke, D.A.; Kyle, C.E.; McEvoy, T.G.; Young, P.; Adam, C.L. **Superovulatory responses to eCG in llamas (*Lama glama*).** *Theriogenology.* July 15, 1995; 44(2): 255-268. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, superovulation, pmsg, gnRH, follicles, corpus luteum, embryos, blood plasma, progesterone.

Abstract: llamas are copulation-induced single-ovulators, and multiple ovulation and embryo transfer (MOET) methods have not yet been developed for this species. Superovulatory responses to eCG given during an induced (Group A) or simulated (Group B) luteal phase were investigated using ultrasound to observe ovarian follicles and corpora lutea (CLs) and plasma progesterone was used to assess luteal function. Embryos were recovered nonsurgically. Group A (n=19): donors were given 8 micrograms, im GnRH analogue (Day 0) to induce ovulation of a mature follicle, 1000 IU, im eCG (Day 7), and 250 micrograms PGF2 alpha analogue (Day 9). Group B (n=17): donors were given a subcutaneous progestagen implant (3 mg Norgestomet at Days 0 to 7) and 1000 IU, im eCG (Day 5). When most (> 65%) of the follicles in both Groups A and B had matured at 5 to 11 d post eCG, the donors were given 8 micrograms, im GnRH and mated once (n=26) or twice within a 24-h interval (n=10); embryos were recovered 6 to 9 d post ovulation. More follicles and corpora lutea were induced in Group B than in Group A, but a similar mean number of embryos were recovered (1.3 vs 1.6), and a similar proportion of donors yielded multiple embryos (35 vs 32%). The embryo recovery rate was similar for Groups A and B (39 and 37%), but it was higher (P < 0.001) with 2 (72%) rather

than 1 (22%) mating, and it was negatively correlated with CL number ($P < 0.05$). Overall, 80% of the llamas had a precocious CL and elevated plasma progesterone concentrations when multiple follicles reached maturity. This was associated with increased subsequent superovulation and embryo recovery ($P < 0.01$). Peak plasma progesterone was positively correlated with the CL number ($P < 0.05$). From these results we conclude that superovulation may be achieved with eCG given during either an induced or a simulated luteal phase, that embryo recovery is improved following 2 matings rather than 1, and that MOET may indeed be feasible for use in the llama.

Bravo, P.W.; Lasley, B.L.; Fowler, M.E. **Resumption of ovarian follicular activity and uterine involution in the postpartum llama.** *Theriogenology*. Oct 15, 1995; 44 (6): 783-791. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, postpartum interval, ovaries, follicles, diameter, uterus, length, involution, urine, estrone, La Raya Research Station, Peru.

Abstract: Resumption of ovarian follicle activity and uterine involution was studied in the post partum llama. Thirty-nine adult multiparous llamas were monitored by ultrasonography and analysis of urinary estrone sulfate for 30 d post partum at the La Raya Research Station in Peru. Uterine involution was measured in terms of reduction of length and diameter of both uterine horns. Correlation analysis was used to relate follicle size and concentration of estrone sulfite. Analysis of variance was used to determine rate of uterine involution relative to days post partum. The left ovary was palpated and scanned by Day 3 post partum in contrast to Day 1 post partum for the right ovary. Ovulatory size follicles, 7 mm, were present by Day 7.4 post partum (range 4 to 14 d). Follicle growth was detected as early as Day 4 post partum with follicle size being less during the first follicle wave (7.4 mm) compared to the second and third waves (9 to 10 mm). Concentrations of urinary estrone sulfate were positively related ($P < 0.05$) to follicular size, but to a lesser degree during the first follicle wave (19.4 ng/mg Cr), than to the second wave (25.4 ng/mg Cr). Uterine involution, as measured by diameter, was different between the left (gravid) and right (nongravid) uterine horn ($P < 0.05$) for the 17 d post partum, and was also different from that of control females for the 21 d post partum. Uterine involution was complete in 63% of females by Day 21 post partum.

Cebra, C.K.; Garry, F.B.; Powers, B.E.; Johnson, L.W. **Lymphosarcoma in 10 new world camelids.** *Journal of Veterinary Internal Medicine*. Nov/Dec 1995; 9(6): 381-385. ISSN: 0891-6640.

NAL call no.: SF601.J65

Descriptors: llamas, alpacas, lymphosarcoma, emaciation, hypo-albuminemia, case reports, animal pathology, symptoms.

Del Campo, M.R.; Del Campo, C.H.; Adams, G.P.; Mapletoft, R.J. **The application of new reproductive technologies to South American camelids.** *Theriogenology*. Jan 1995; 43(1): 21-30. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, alpacas, reproductive physiology, ovaries, uterus, ovarian follicles, ultrasonography, embryo transfer, semen, artificial insemination, zygotes, in vitro, fertilization.

Abstract: The interest in applying new reproductive technologies in South American camelids has increased dramatically over the last decade due in part to their unique reproductive characteristics and the potential for commercial application. The objectives of this presentation are to summarize and review the current status of research on reproductive physiology of South American camelids and to review more recent work on the application of new technologies to these species. Reproductive technologies reported in other species, including AI, superovulation, embryo transfer and IVF to some extent have now been successfully applied to South American camelids. In this report, particular attention will be given to ovarian follicular dynamics, oocyte maturation, fertilization and embryo development in vitro and in vivo. These species offer an excellent model for the study of reproductive events in induced ovulators. It is expected that knowledge obtained in the domesticated species of South American camelids (llama and alpaca) will be applicable and contribute to the preservation of other camelid species (guanacos, vicunas and old world camelids) and other unrelated exotic species.

Del Campo, M.R.; Del Campo, C.H.; Mapletoft, R.J.; Ginther, O.J. **Morphology and location of attached follicular cumulus-oocyte complexes in horses, cattle and llamas.** *Theriogenology*. Feb 1995; 43(3): 533-542. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: mares, cows, llamas, ovaries, follicles, cumulus-oophorus, oocytes, histology, species differences,

granulosa cells, ovulation.

Abstract: Morphology and location of the attached cumulus oocyte complex (COC) were studied in slaughter-house ovaries in horses (49 follicles, 9 to 44 mm), cattle (68 follicles, 6 to 18 mm), and llamas (38 follicles, 3 to 14 mm). The expected point of ovulation was marked, using the ovulation fossa in mares and the center of the projecting follicular surface in cattle and llamas. A follicle was dissected from an ovary, and tissue was removed from the follicle until the COC became visible by transillumination. However, most llama follicles protruded prominently from the ovarian surface so that dissection was not required to locate the COC. The COC was more readily recognized from the external follicular surface in mares and llamas than in cattle, primarily because of a dark oocyte. Compact COC's projected into the antrum with a smooth dome-shape in horses. The COC's in cattle were also dome-shaped but were more irregular and a few contained prominent processes. The mean diameter of the isolated follicle was calculated from 3 planes, except that in llamas the follicles were spherical so that the 3 dimensions were identical. The angle between a straight line connecting the expected ovulation site and the opposite pole and a straight line from the ovulation site to the COC was defined as the COC-location angle. This angle was chosen because it is unaltered by size of a sphere (45 degrees for a COC at the equator). The mean (+/-SEM) COC-location angle differed ($P < 0.01$) among horses (39.9 +/- 3.3), cattle (50.0 +/- 2.5), and llamas (64.8 +/- 2.1). In mares, the locations of the COC's did not differ from equality between follicular hemispheres, but in cattle and llamas the COC's were located with greater frequency ($P < 0.05$) in the hemisphere containing the expected ovulation site (cattle, 65%; llamas, 91%).

Drew, M.L. **Comparison of methods for measuring serum immunoglobulin concentrations in neonatal llamas.**

Journal of the American Veterinary Medical Association. May 1, 1995; 206(9): 1374-1380. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, newborn animals, immunoglobulins, blood serum, measurement, passive immunity, tests, accuracy, failure of passive transfer.

Drew, M.L.; Alexander, B.M.; Sasser, R.G. **Pregnancy determination by use of pregnancy-specific protein B**

radioimmunoassay in llamas. *Journal of the American Veterinary Medical Association.* July 15, 1995; 207(2): 217-219. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, pregnancy diagnosis, radioimmunoassay, blood proteins, detection.

Dumont, B.; Meuret, M.; Prud'hon, M. **Direct observation of biting for studying grazing behavior of goats and**

llamas on garrigue rangelands. *Small Ruminant Research.* Mar 1995; 16(1): 27-35. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: goats, llamas, feeding preferences, garrigue rangelands, feed intake, dry matter, spring, summer, grazing behavior, browse plants, browsing, botanical composition, biting rates, France.

Garnica, J.; Flores, E.; Bravo, P.W. **Citric acid and fructose concentrations in seminal plasma of the alpaca.** *Small Ruminant Research.* Sept 1995; 18(1): 95-98. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: alpacas, semen characters, seminal plasma, fructose, citric acid, spermatozoa, age differences, ejaculate volume, Peru.

Garay, G.; Franklin, W.L.; Sarno, R.J.; Johnson, W.E. **Development of juvenile guanaco social behavior: first study on a wild population.** *Revista Chilena de Historia Natural.* 1995; 68(4): 429-438. ISSN: 0716-078X.

Descriptors: guanacos, young animals, wild populations, social behaviors, growth and development, diurnal activity, Torres del Paine National Park, Patagonia, Chile.

Garry, F. **Intravenous catheterization of llamas.** *Proceedings of the North American Veterinary Conference.* 1995; 9: 597-598.

NAL call no.: SF605.N672

Descriptors: techniques, blood sampling.

Gelatt, K.N.; Otzen Martinic, G.B.; Leal Falneig, J.; Schein, O.D.; Munoz, B.; West, S.K.; Duncan, D.D.; Nethercott, J.R.; Koren, H.S. **Results of ophthalmic examinations of 29 alpacas.** *Journal of the American Veterinary Medical*

Association. Apr 15, 1995; 206(8): 1204-1207. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: alpacas, eye diseases, coat, color, eyes, pigmentation, Chile, iris of the eyes, ocular fundus.

Good, B.A.; Geisert, R.D.; Corbin, C.J.; Conley, A.J. **Sex identification in mammals with polymerase chain reaction and its use to examine effects on diameter of day-10 or -11 pig embryos.** *Journal of Animal Science*. May 1995; 73(5): 1408-1415. ISSN: 0021-8812.

NAL call no.: 49 J82

Descriptors: pigs, embryonic development, sex diagnosis, rapid methods, polymerase chain reaction, sex differences, growth rate, nucleotide sequences, DNA probes, species differences, mammals, embryos, llamas, cattle, goats, horses, baboons, dogs, cats, rats, mice.

Abstract: The objectives of this study were to develop a rapid method for sex determination for several mammalian species using polymerase chain reaction (PCR) and to use this method to determine whether there is a significant developmental difference in spherical diameter between male and female d-10 or -11 porcine embryos. The PCR system was developed and verified using genomic DNA from pigs of known sex, then it was tested with genomic DNA from several other mammalian species. Sex is determined by amplification of two genes in a single reaction. The presence or absence of a region of the Sry (sex-determining region Y) gene determines sex, and amplification of the Zfy (male) or Zfx (female) genes acts as a positive control for PCR. Sex determination was successful for all animals tested, including pigs, cattle, sheep, goats, llamas, horses, humans, baboons, dogs, cats, rats, and mice. A total of 209 embryos were collected from 21 crossbred gilts on d 10 or 11 of gestation, and their diameters were measured. No significant difference in embryo diameter was detected between male and female embryos, indicating that sexual dimorphism in embryonic growth in pigs does not occur before the period of rapid embryo elongation. The present sexing technique using PCR is rapid (approximately 6 h from receipt of embryos to results), and it may be useful for examining the effects of sex on any trait of interest in early porcine embryos and embryos from several other mammals.

Groom, S.; Checkley, S.; Crawford, B. **Hepatic necrosis associated with halothane anesthesia in a alpaca.** *Canadian Veterinary Journal*. Jan 1995; 36(1): 39-41. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: alpacas, halothane effects, liver, necrosis, adverse effects, histopathology, hepatitis, case reports.

Gustafson, L.; Franklin, W. **Predictions of neonatal mortality in the guanacos (*Lama guanaco*) of Torres del Paine, Chile: a pilot study in adaptive modeling of the wildlife population health.** In: T.B. Herman; S. Bondrup; J.H. Martin Willison; N.P. Munro (Editors). *Ecosystem Monitoring and Protected Areas. Proceedings of the Second International Conference on Science and the Management of Protected Areas*. Dalhousie University, Nova Scotia. 1995. p. 285-289.

Descriptors: guanacos, neonatal deaths, pilot study, adaptive modeling, assessing health of wildlife populations, Torres del Paine National Park, Chile.

Herdt, T.H. **Blood serum concentrations of selenium in female llamas (*Lama glama*) in relationship to feeding practices, region of United States, reproductive stage, and health of offspring.** *Journal of Animal Science*. Feb 1995; 73(2): 337-344. ISSN: 0021-8812.

NAL call no.: 49 J82

Descriptors: llamas, selenium, blood serum, pregnancy, vitamin E, newborn animals, diet, postpartum period, normal values, mineral supplements, crias, Lake States and Mountain States of the United States.

Abstract: Serum Se and vitamin E concentrations were determined twice in each of 35 female llamas from a high-Se region and 96 female llamas from a low-Se region of the United States. The first determination was taken at a random time during gestation and the second shortly after parturition. At the time of postpartum sampling, a sample was also taken from the cria. Dietary information was collected from each llama owner and a subjective estimate of strength and vigor was assigned by the owner to each cria studied. The mean blood serum concentrations of Se in llamas during gestation and at parturition were 213 and 203 ng/mL, respectively. The mean serum Se concentration was 113 ng/mL in neonatal cria. Among herds, serum Se means varied for the cria ($P < .05$) and at both sampling times in the females ($P < .01$). In adult females, mean serum Se was actually higher during gestation ($P = .06$) and at parturition ($P < .01$) for the low-Se region than for the high-Se region, but this effect was removed by covariate adjustment for intake of supplemental Se. Serum Se in females was correlated ($P < .05$) to supplemental Se consumption. Vigor and (or) viability

of the cria were not affected by the Se status of the dams ($P > .3$) or cria ($P > .2$). However, there were very few weak or stillborn cria in this study. The data suggest that serum Se in excess of 85 ng/mL is adequate for newborn cria and that dams with serum Se in excess of 160 ng/mL can be predicted to give birth to cria with adequate Sestatus.

Hoffman, Eric; Fowler, Murray E. *The Alpaca Book*. [1st ed.]. Clay Press, Herald, Calif. 1995. 255 p., ill. ISBN: 0964661802.

NAL call no.: SF401.A4H64 1995

Descriptors: alpaca, care, treatment, diseases, management.

Hong, C.B.; Donahue, J.M. *Rhodococcus equi*-associated necrotizing lymphadenitis in a llama. *Journal of Comparative Pathology*. July 1995; 113(1): 85-88. ISSN: 0021-9975.

NAL call no.: 41.8 J82

Descriptors: llamas, *Rhodococcus equi*, lymphadenitis, necrosis, spleen, lymph nodes, lungs, pneumonia, symptoms.

Hutchison, J.M.; Salman, M.D.; Garry, F.B.; Johnson, L.W.; Collins, J.K.; Keefe, T.J. **Comparison of two commercially available single radial immunodiffusion kits for quantitation of llama immunoglobulin G**. *Journal of Veterinary Diagnostic Investigation*. Oct 1995; 7(4): 515-519. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, IgG, immunodiffusion tests, blood plasma, immunoglobulins, accuracy.

Hutchison, J.M.; Garry, F.B.; Belknap, E.B.; Getzy, D.M.; Johnson, L.W.; Ellis, R.P.; Quackenbush, S.L.; Rovnak, J.; Hoover, E.A.; Cockerell, G.L. **Prospective characterization of the clinicopathologic and immunologic features of an immunodeficiency syndrome affecting juvenile llamas**. *Veterinary Immunology and Immunopathology*. Dec 1995; 49(3): 209-227. ISSN: 0165-2427.

NAL call no.: SF757.2.V38

Descriptors: llamas, young animals, immunological deficiency, epidemiology, diagnosis, retroviridae, clinical aspects, disease course, lymphocyte transformation, lymph nodes, bone marrow, immunoglobulins.

International Llama & Alpaca Directory: Llama Owners Location Guide. 2nd. ed. Able Publishing. Able Pub., Manhattan, Kan. [1995?] 60 p., col. ill., maps.

NAL call no.: SF401.L6I58 1995

Descriptors: llamas, alpacas, farm locations, directories.

Johnson, L.W. **Uterine biopsy in llamas**. *Proceedings of the North American Veterinary Conference*. 1995; 9: 599-600.

NAL call no.: SF605.N672

Descriptors: uterus, techniques.

Kingston, J.K.; Staempfli, H.R. **Silica urolithiasis in a male llama**. *Canadian Veterinary Journal*. Dec 1995; 36(12): 767-768. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: llamas, urolithiasis, urinary calculi, silica, feed evaluation, water intake, catheterization, surgery, case reports.

Lackey, M.N.; Belknap, E.B.; Salmon, M.D.; Tinguely, L.; Johnson, L.W. **Urinary indices in llamas fed different diets**. *American Journal of Veterinary Research*. July 1995; 56(7): 859-865. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, renal function, alfalfa hay, hay, creatinine, excretion, electrolytes, urine, blood serum, osmotic pressure, enzyme activity, protein content, grass hay.

Abstract: Indices of renal function and damage were measured in 12 healthy male adult llamas fed a diet of mixed alfalfa/grass hay (mixed hay) and water ad libitum. Using a collection bag fitted over the preputial area, urine samples were collected at 6, 12, and 24 hours. Serum samples were obtained concurrently to determine endogenous creatinine clearance (CL), total (TE) and fractional excretion (FE) of electrolytes (Na, K, Cl, P), electrolyte CL, urine and serum osmolality, urine enzyme activities (gamma-glutamyltransferase and N-acetyl-beta-D-glucosaminidase), and urine protein concentration. Urine production was quantified. Three months later, 10 of the 12 llamas were fed a grass hay diet and water ad libitum. Similar samples were obtained, and similar measurements were made. Urine production was

higher when the llamas were fed the mixed hay diet. Total urine volume for llamas fed mixed hay ranged from 628 to 1,760 ml/24 h, with a median of 1,307.5 ml/24 h, compared with a range of 620 to 1,380 ml/24 h and a median of 927.50 ml/24 h for llamas fed grass hay. Median urine osmolality was higher in llamas fed mixed hay (1,906 mOsm/kg of body weight, with a range of 1,237 to 2,529 mOsm/kg), compared with llamas fed grass hay (1,666 mOsm/kg with a range of 1,163 to 2,044 mOsm/kg). Creatinine CL did not vary significantly over time for either diet. Median creatinine CL was higher for llamas fed mixed hay, compared with llamas fed grass hay--0.78 ml/min/kg with a range of 0.20 to 1.83 ml/min/kg vs 0.45 ml/min/kg with a range of 0.13 to 3.17 ml/min/kg. Clearances for K and Cl varied significantly among the periods. However, median CL for Na and P did not vary over time for either diet. Overall values for these electrolytes in llamas fed mixed hay and grass hay diets were: CL(Na), 0.001 and 0.002 ml/min/kg and CL(P), 0.0006 and 0.0004 ml/min/kg respectively. The FE rates of K, Cl, and P did not vary significantly over time for either diet. Median respective FE for these electrolytes in the llamas fed mixed hay and grass hay diets include: FE(K), 84.90 and 63.10%; FE(Cl), 0.85 and 1.30%; and FE(P), 0.10 and 0.10%. Fractional excretion of Na varied over time for both diets and could not be expressed accurately as an overall median. Median respective TE of electrolytes for llamas fed the mixed hay and grass hay diets were: TE(Na), 0.007 and 0.03 mEq/kg/h; TE(Cl), 0.04 and 0.06 mEq/kg/h; and TE(P), 0.0002 and 0.00 mg/kg/h; TE(K) varied significantly ($P < 0.05$) over time for both diets. Urine gamma-glutamyltransferase activity changed significantly ($P < 0.05$) over time. Urine N-acetyl-beta-D-glucosaminidase activity was influenced by an interaction between diet and time. Median urine protein concentration was 26.0 mg/dl, with a range of 11.0 to 73.0 mg/dl for llamas fed mixed hay, and was 28.0 mg/dl, with a range of 16.0 to 124.0 mg/dl for llamas fed grass hay.

Llanos, A.J.; Riquelme, R.A.; Moraga, F.A.; Cabello, G.; Parer, J.T. **Cardiovascular responses to graded degrees of hypoxaemia in the llama fetus.** *Reproduction, Fertility, and Development*. 1995; 7(3): 549-552. ISSN: 1031-3613.

NAL call no.: QP251.R47

Descriptors: fetus, llamas, hypoxanemia, cardiovascular response, reproduction.

Lopez, M.J.; Snyder, J.R. **Tetanus in a llama.** *Equine Practice*. Apr 1995; 17 (4): 26-28, 30-31. ISSN: 0162-8941

NAL call no.: SF951.E62

Descriptors: llamas, tetanus, *Clostridium tetani*, symptoms, drug therapy, case reports.

Macher, R. **Small farm alpacas.** *Small Farm Today*. Oct 1995; 12(5): 30. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: alpacas, animal breeding, animal husbandry, small farms, alternative livestock, United States.

Morin, D.E.; Rowan, L.L.; Hurley, W.L.; Braselton, W.E. **Composition of milk from llamas in the United States.**

Journal of Dairy Science. Aug 1995; 78(8): 1713-1720. ISSN: 0022-0302.

NAL call no.: 44.8 J822

Descriptors: llamas, milk yield, milk, lactose, milk protein percentage, milk fat percentage, calcium, phosphorus, magnesium, sodium, potassium, chloride, sulfur, species differences, United States.

Abstract: Neonatal llamas must receive supplemental milk when the dam has inadequate milk yield or fails to accept the cria. Data on llama milk composition are limited, and selection of suitable milk supplements has been difficult. Milk from 83 llamas on eight farms in four states (Illinois, Kentucky, Michigan, and Colorado) was collected, and milk composition was analyzed. Llamas had no history or signs of mastitis, and major mastitis pathogens were not isolated from the milk. Total solids were determined gravimetrically. A colorimetric method, a dye-binding assay, and the modified Mojonnier method were used to quantify lactose, protein, and fat, respectively. Concentrations of seven macrominerals and 17 trace elements were obtained by inductively coupled plasma atomic emission spectroscopy, and Cl was quantified by anion chromatography. Llama milk was higher in sugar (6.5%) and lower in fat (2.7%) and energy content (70.0 kcal/100 g) than milks of domestic ruminants. Llama milk also contained more Ca and less Na, K, and Cl. In general, milk composition was not affected by stage of lactation, lactation number, or body condition score of the llama, but several milk constituent varied among farms.

Ortega, I.M.; Franklin, W.L. **Social organization, distribution and movements of a migratory guanaco population in the Chilean Patagonia.** *Revista Chilena de Historia Natural*. 1995; 68: 489-500. ISSN: 0716-078X.

Descriptors: guanacos, wild animal populations, migratory populations, behaviors, distribution over habitat, population density, movement, food availability, snow cover effects on movements, social organization, Torres del Paine National

Park, Patagonia, Chile.

Pollard, J.C.; Littlejohn, R.P. **Effects of social isolation and restraint on heart rate and behaviour of alpacas.**

Applied Animal Behaviour Science. Oct 1995; 45(1/2): 165-174. ISSN: 0168-1591.

NAL call no.: QL750.A6

Descriptors: alpacas, isolation, restraint of animals, heart rate, animal behavior, stress, handling.

Pugh, D.G.; Causey, M.K.; Blagburn, B.L.; Wolfe, D.F. **Clinical parelaphostrongylosis in llamas.** *Compendium on Continuing Education for the Practicing Veterinarian*. Apr 1995; 17(4): 600-606. ISSN: 0193-1903.

NAL call no.: SF601.C66

Descriptors: llamas, *Parelaphostrongylus tenuis*, alternative hosts, *Odocoileus virginianus*, white tailed deer, intermediate hosts, life cycle, Gastropoda, cerebrospinal fluid, eosinophilia, normal values, diagnosis, anthelmintics.

Pugh, D.G. **Leptospirosis in llamas.** *Proceedings of the North American Veterinary Conference*. 1995; 9: 606.

NAL call no.: SF605.N672

Descriptors: *Leptospira interrogans*, bacterial disease, diagnosis.

Pugh, D.G. **Mineral nutrition in llamas.** *Proceedings of the North American Veterinary Conference*. 1995; 9: 603-605.

NAL call no.: SF605.N672

Descriptors: dietary needs, physiology, metabolism, mineral requirements.

Ridge, S.E.; Harkin, J.T.; Badman, R.T.; Mellor, A.M.; Larsen, J.W.A. **Johne's disease in alpacas (*Lama pacos*) in Australia.** *Australian Veterinary Journal*. Apr 1995; 72(4): 150-153. ISSN: 0005-0423.

NAL call no.: 41.8 Au72

Descriptors: alpacas, *Mycobacterium paratuberculosis*, symptoms, diagnosis, lymph nodes, pathology, histopathology, case reports, Victoria.

Schwarzenberger, F.; G. Speckbacher; E. Bamberg. **Plasma and fecal progestagen evaluations during and after the breeding season of the female vicuna (*Vicugna vicugna*) [sic].** *Theriogenology*. Feb 1995; 43(3): 625-634. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: vicunas, blood plasma, feces, progesterone, breeding season, metabolites, hormone secretion, corpus luteum hormones, HPLC, 20-alpha-dihydroprogesterone.

Abstract: Plasma and fecal progestagen patterns of female (n=10) vicunas (*Vicugna vicugna*) were determined about 1 to 2 mo before and until 4 mo after breeding. The vicunas were caught wild and were penned at the Lauca National Park (Chile, 4470 m above sea level) for 7 mo (December to June). Plasma and fecal samples before and during the mating period (January to March) were collected 4 to 5 times weekly, and once or twice weekly thereafter. The samples were analyzed by enzyme-immunoassays (EIA) using antibodies against progesterone and 20 alpha-dihydroprogesterone. High performance liquid chromatography (HPLC) separations confirmed that progesterone and 20 alpha dihydroprogesterone predominated in the plasma, whereas in the fecal several unconjugated, immunoreactive progestagen metabolites containing either a 20-oxo- or a 20 alpha-OH-group occurred. The coefficients of correlation (n = 409; P < 0.01) between matched plasma and fecal samples were 0.39 and 0.53 for 20-oxo- and 20a-progestagens, respectively. Elevated (5 to 6 d) plasma and corresponding fecal progestagens after mating indicated cyclic corpus luteum activity in 5 of the animals. After the mating period (23.2 +/- 3.3 d), corpus luteum function in these 5 animals persisted, as it did in 3 other animals that were not observed to be mating. The persisting corpus luteum function was demonstrated by increased mean plasma and fecal progestagen concentrations (> 1 ng/ml and > 100 ng/g, respectively). Mean plasma 20 alpha-dihydroprogesterone concentrations exceeded that of progesterone by about 1 ng/ml (P < 0.01). The results demonstrated that in addition to plasma progesterone, plasma 20 alpha-dihydroprogesterone and noninvasive fecal progestagen evaluations are useful, valid tools for determining corpus luteum function in vicunas.

Selbert, P. **Rod Malchow's camels.** *Small Farm Today*. Dec 1995; 12(6): 45-46. ISSN: 1079-9729.

NAL call no.: S1.M57

Descriptors: small farm livestock enterprises, anecdotal information.

Watrous, B.J.; Pearson, E.G.; Smith, B.B.; Snyder, S.P.; Blythe, L.L.; Riebold, T.W.; Hedstrom, O.R. **Megaesophagus**

in 15 llamas: a retrospective study (1985-1993). *Journal of Veterinary Internal Medicine.* Mar/Apr 1995; 9(2): 92-99. ISSN: 0891-6640.

NAL call no.: SF601.J65

Descriptors: llamas, esophagus, etiology, iron deficiency anemia, organophosphorus compounds, toxicity.

Wheeler, J.C. **Evolution and present situation of the South American Camelidae.** *Biological Journal of the Linnean Society.* Mar 1995; 54 (3): 271-298. ISSN: 0024-4066.

NAL call no.: QH301.B56

Descriptors: guanacos, vicunas, llamas, alpacas, evolution, taxonomy, domestication, interspecific hybridization, South America.

Wintour, E.M.; Riquelme, R.; Gaete, C.; Rabasa, C.; Sanhueza, E.; Silver, M.; Towstoles, M.; Llanos, A. **Renal function in the chronically cannulated fetal llama: comparison with studies in the ovine fetus.** *Reproduction, Fertility, and Development.* 1995; 7(5): 1311-1319. ISSN: 1031-3613.

NAL call no.: QP251.R47

Descriptors: fetuses, llama, reproduction, comparative study, sheep, renal functioning.

Woolums, A.R.; DeNicola, D.B.; Rhyan, J.C.; Murphy, D.A.; Kazacos, K.R.; Jenkins, S.J.; Kaufman, L.; Thornburg, M. **Pulmonary histoplasmosis in a llama.** *Journal of Veterinary Diagnostic Investigation.* Oct 1995; 7(4): 567-569. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, histoplasmosis, *Histoplasma capsulatum*, lungs, symptoms, diagnosis, histopathology, case reports.

Yarbrough, T.B.; Snyder, J.R.; Harmon, F.A. **Jejunal microvasculature of the llama and alpaca.** *American Journal of Veterinary Research.* Sept 1995; 56(9): 1133-1137. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, alpacas, jejunum, blood vessels, animal anatomy.

Abstract: The vasculature of the jejunum was studied in 6 llamas and 1 alpaca, using a combination of microangiography, standard light microscopy, and vascular cast imaging. The casts were examined by use of scanning electron microscopy and low-power dissecting microscopy. After administration of 40,000 IU of heparin, all animals were euthanatized by administration of an overdose of sodium pentobarbital. Three sections of jejunum and their respective arcuate vessels were isolated from each animal. One section was immediately placed in formalin for later H&E staining. The second and third sections were placed in warm saline solution, and the vasculature was flushed free of all blood by repeated infusions of the solution. Once flushed of all blood, one section was infused with a radio-opaque medium and subsequently evaluated by microangiography, and the remaining section was perfused with a methylmethacrylate polymer for creation of vascular casts. The arcuate vessels branched into extensive primary and secondary arcades prior to giving rise to the marginal rete. Muscular arteries and small veins left the marginal rete and penetrated the tunica serosa and tunica muscularis to provide nutrients or drain the mesenteric angle, respectively, or entered into the circumferential submucosal network. The primary penetrating vessels in the submucosa formed an extensive submucosal plexus that supplied the tunica serosa, tunica muscularis, and tunica mucosa. The primary penetrating vessels anastomosed with vessels from oral and aboral sections and with their counterparts from the opposite side at the antimesenteric border. Vessels supplied the tunica serosa and tunia muscularis by branching centrifugally from the submucosal plexus supplying the inner circular and outer longitudinal muscle layers parallel to their respective muscle layers. The arterioles supplying the tunica mucosa branched at right angles, penetrated the muscularis mucosa, and gave rise to clusters of arterioles supplying either the villi or the intervening crypts; anastomosis occurred between these 2 systems toward the base of the villus. The arterioles gradually developed a discontinuous smooth muscle layer as they approached the base of the villus. Each villus was supplied by a single centrally placed metarteriole that spiraled to the tip of the villus, divided, and descended in a fountaining capillary network. The individual capillaries in the cascade coalesced to drain via 2 to 4 venules at the base of the villus. Branches from the venules entered into an anastomosing network in the lamina propria to drain the crypts. Venules drained in the submucosal plexus and continued paralleling the arterial supply toward the mesenteric border and the arcuate veins. The jejunal vasculature of South American camelids contains an extensive set of anastomotic connections at all levels after formation of the arcuate vessels. Within the scope of this examination into the

microvasculature of llamas and alpacas, differences were not detected between the individual species.

Yarbrough, T.B.; Snyder, J.R.; Harmon, F.A. **Laparoscopic anatomy of the llama abdomen.** *Veterinary Surgery.* May/June 1995; 24(3): 244-249. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: llamas, body parts, abdominal cavity, laparoscopy, animal anatomy, diagnostic value, enteritis.

1994

Adams, R.; Garry, F. **Llama neonatology.** *Veterinary Clinics of North America. Food Animal Practice.* July 1994; 10(2): 109-227. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, newborn animals, young animal diseases, diagnostic techniques, treatment.

Allen, J. **Diversification in the woolbelt.** *Journal of Agriculture.* 1994; 35(1): 30-34. ISSN: 0021-8618.

NAL call no.: 23 W52J

Descriptors: farm enterprises, wool production, diversification, profitability, floriculture, aquaculture, hay, exports, rural tourism, farm forestry, horticulture, deer farming, goats, livestock farming, game farming, alpacas, emus, ostriches.

Alpaca Owners and Breeders Association. **Alpacas.** Alpaca Owners and Breeders Association, Manhattan, Kan. Dec. 1994. v., ill.

NAL call no.: SF401.A4A57

Descriptors: alpacas, periodicals.

Andreasen, C.B.; Gerros, T.C.; Lassen, E.D. **Evaluation of bone marrow cytology and stainable iron content in healthy adult llamas.** *Veterinary Clinical Pathology.* 1994; 23(2): 38-42. ISSN: 0275-6382.

NAL call no.: SF601.A54

Descriptors: llamas, blood cells, erythrocyte count, leukocyte count, sternum, bone marrow cells, blood picture, normal values, altitude, Oregon.

Anderson, D.E.; Constable, P.D.; Yvorchuk, K.E.; Anderson, N.V.; St. Jean, G.; Rock, L. **Hyperlipemia and ketonuria in an alpaca and a llama.** *Journal of Veterinary Internal Medicine.* May/June 1994; 8 (3): 207-211. ISSN: 0891-6640.

NAL call no.: SF601.J65

Descriptors: llamas, alpacas, hyperlipemia, ketonuria, case reports, pregnancy complications, blood serum, blood chemistry, insulin, dehydration physiological, fluid therapy, blood sugar, triacylglycerols, cholesterol, L840.

Anonymous. **Vaccination guidelines for small ruminants (sheep, goats, llamas, domestic deer, and wapiti).** *Journal of the American Veterinary Medical Association.* Dec 1, 1994; 205(11): 1539-1544. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: sheep, goats, llamas, deer, *Cervus elaphus canadensis*, vaccination, guidelines, vaccines, animal diseases, United States.

Arce, B.A.; Anguilar, C.; Canas, R.; Quiroz, R.A. **A simulation model of an alpaca system in the dry puna of the Andes.** *Agricultural Systems.* 1994; 46(2): 205-225. ISSN: 0308-521X.

NAL call no.: HD1.A3

Descriptors: alpacas, animal production, energy metabolism, simulation models, farming systems, mountain areas.

Baum, K.H. **IgG testing in crias.** *Proceedings of the North American Veterinary Conference.* 1994. p. 839.

NAL call no.: SF605.N672

Descriptors: llamas, IgG.

Baum, K.H. **Neurologic diseases of sheep, goats & llamas.** *Proceedings of the North American Veterinary Conference.* 1994. p. 835-838.

NAL call no.: SF605.N672

Descriptors: sheep, diseases, goat diseases, llamas, neurology.

Belknap, E.B. **Medical problems of llamas.** *Veterinary Clinics of North America. Food Animal Practice.* July 1994; 10(2): 291-307. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, animal diseases, digestive system diseases, respiratory diseases, peritonitis, recumbent llamas.

Belknap, E.B.; Getzy, D.M.; Johnson, L.R.; Ellis, R.P.; Thompson, G.L.; Shulaw, W.P. ***Mycobacterium paratuberculosis* infection in two llamas.** *Journal of the American Veterinary Medical Association.* June 1, 1994; 204(11): 1805-1808. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, *Mycobacterium paratuberculosis*, symptoms, diagnosis, postmortem examinations, Johne's disease, case reports.

Boon, J.A.; Knight, A.P.; Moore, D.H. **Llama cardiology.** *Veterinary Clinics of North America. Food Animal Practice.* July 1994; 10(2): 353-370. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, cardiovascular diseases, auscultation, electrocardiography, echocardiography, disease prevalence, heart, congenital abnormalities, acquired heart disease.

Bravo, P.W.; Fowler, M.E.; Lasley, B.L. **The postpartum llama: fertility after parturition.** *Biology of Reproduction.* Dec 1994; 51(6): 1084-1087. ISSN: 0006-3363.

NAL call no.: QL876.B5

Descriptors: llamas, postpartum period, female fertility, sexual behavior, ovulation, conception rate, urine, hormones, embryos, heart sounds, estrone sulfate, pregnanediol glucuronide, heart beat.

Abstract: Fertility was evaluated at various times during the postpartum period in the llama. Fifty-six parous female llamas chosen at random were bred at 10, 20, and 30 days postpartum with six intact males. Half of the females copulated only once and the other half twice within an interval of 24 h. Ovarian activity was monitored by ultrasonography and analysis of urinary estrone sulfate and pregnanediol glucuronide (PdG). At the time of copulation, all females had developed ovulatory-size follicles. Ovulation was confirmed by the presence of a CL at 8 days after breeding and PdG concentrations > 1 ng/mg creatinine (Cr). Conception was defined as PdG concentrations > 1 ng/mg Cr at 15 days after breeding and the presence of a CL. Pregnancy was defined as the presence of a CL, PdG concentrations > 1 ng/mg Cr and an embryonic vesicle 20 days postbreeding. There were no significant differences in the proportion of females ovulating after breeding at different times postpartum; however, conception and pregnancy were significantly greater in females bred at Day 20 or 30. Ovarian follicle size was significantly larger at 30 days (9.1 mm) than at 10 and 20 days (7.9 and 8.8 mm, respectively) of breeding, with no difference in concentrations of estrone sulfate. The proportion of females conceiving as a result of breeding at 10 days postpartum (6 out of 10) was significantly less than for females bred at 20 (13 out of 15) or 30 days (16 out of 18). There were significant differences in the diameter of the uterine horns in females bred at 10 days (5.2-cm diameter) in contrast to females bred at 20 or 30 days (2.9 and 2.7 cm, respectively). These data demonstrate that the llama may ovulate as early as 10 days postpartum however, pregnancy rates from breeding at 20 or 30 days were threefold higher (61%) than those in females bred at 10 days postpartum (21%).

Bravo, P.W.; Johnson, L.W. **Reproductive physiology of the male camelid.** *Veterinary Clinics of North America. Food Animal Practice.* July 1994; 10(2): 259-264. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, alpacas, reproductive physiology, sires, animal anatomy, testes, male genitalia, sexual development, sexual behavior, reproductive disorders.

Bryden, Douglas. **Wildlife: the T.G. Hungerford Refresher Course for Veterinarians, 19-23 September 1994, venue: Western Plains Zoo, Dubbo NSW. Refresher Course for Veterinarians; Proceedings**, no. 233. Post Graduate Committee in Veterinary Science, University of Sydney, Sydney South NSW, Australia. [1994] x, 675 p., ill. ISBN: 1875582401.

NAL call no.: SF604.R37 no. 233

Descriptors: wildlife diseases, wildlife rehabilitation, Australia.

Del Campo, M.R.; Del Campo, C.H.; Donoso, M.X.; Berland, M.; Mapletoft, R.J. **In vitro fertilization and development of llama (*Lama glama*) oocytes using epididymal spermatozoa and oviductal cell co-culture.**

Theriogenology. 1994; 41(6): 1219-1229. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, oocytes, embryo culture, spermatozoa, in vitro, fertilization, embryonic development, Chile.

Abstract: A study was designed to determine the feasibility of developing in vitro maturation, fertilization and culture systems utilizing follicular oocytes and epididymal spermatozoa collected from llamas at slaughter. From a total of 1324 cumulus oocyte complexes (COCs) recovered, 972 were cultured in 50-microliter drops of TCM-199 medium with 10% heat inactivated steer serum (DBS) and hormones for 30 h. After maturation, the oocytes were randomly allocated into 4 groups in a 2 X 2 factorial design: cumulus-enclosed oocytes, 2 micrograms/ml heparin (Group 1); cumulus-enclosed oocytes, 5 micrograms/ml heparin (Group 2); denuded oocytes, 2 micrograms/ml heparin (Group 3); and denuded oocytes, 5 micrograms/ml heparin (Group 4). Denuded oocytes were obtained for groups 3 and 4 by vortexing. Epididymides were also collected at slaughter and fresh spermatozoa (for each replicate) were obtained by mincing the cauda epididymis with a scalpel blade. A total of 721 oocytes were inseminated with 2-3 X 10⁶ epididymal spermatozoa/ml in a 50-microliter drop of FERT-TALP medium. After 18 h of in vitro insemination, 234 oocytes were placed in a llama oviductal epithelial cell (LLOEC) co-culture in TCM-199 for 9 d. All cultures were done at 38.5 degrees C under 5% CO₂ in air with high humidity. The rate of fertilization, initial cleavage and development in co-culture were evaluated and compared. Of 192 oocytes examined for signs of fertilization, 56 (29.2%) were penetrated by spermatozoa with 57.1% (32/56) of the penetrated oocytes having a male and female pronucleus. There were no differences among treatment groups in total fertilization. However, the frequency of oocytes fertilized normally tended to be higher in the denuded oocytes 67.7% (21/31) than the oocytes inseminated with cumulus cells 44.0% (11/25) independent of heparin concentration (P < 0.06). The total embryo development rate to the 2 cells to blastocyst stage was 32.1% (75/234). There was no difference in development rate between groups. From the 234 oocytes co-cultured in LLOEC for 9 d 15.8% developed into 2 to 16 cells, 5.6% into morulae, 6.0% into early/expanded blastocysts and 4.7% into hatching/hatched blastocysts. The results indicate that an in vitro fertilization system is possible in the llama utilizing slaughterhouse material and that llama oocytes can be fertilized in the presence of heparin and epididymal spermatozoa.

Evans, C.N. **Failure to thrive complex failure to thrive and immunodeficiency syndrome (IDS).** *Proceedings of the North American Veterinary Conference*. 1994. p. 847.

NAL call no.: SF605.N672

Descriptors: llamas, immunological deficiency.

Evans, C.N.; Matthews, D.M. **Llamas 101: the basics.** *Proceedings of the North American Veterinary Conference*. 1994. p. 840-844.

NAL call no.: SF605.N672

Descriptors: llamas, veterinary medicine.

Evans, C.N. **Nutrition in llamas what veterinarians should know.** *Proceedings of the North American Veterinary Conference*. 1994. p. 845-846.

NAL call no.: SF605.N672

Descriptors: llamas, animal nutrition, diet.

Fowler, M.E. **Health care of the geriatric llama and alpaca.** *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 391-399. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, alpacas, animal health, geriatrics, old age, aging, animal husbandry.

Fowler, M.E. **Hyperthermia in llamas.** *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 309-317. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, alpacas, hyperthermia, etiology, physiopathology, organs, disease course, postmortem examinations, differential diagnosis, therapy, disease prevention.

Franklin, W.L.; Powell, K.J. **Guard Llamas: a Part of Integrated Sheep Protection.** Iowa State University Extension Service. The University at Ames. 1994. Pm-1527. 12 p.

NAL call no.: 275.29 IO9PA

Descriptors: sheep protection, llamas as guard animals, dog and coyote predation control, non-lethal pest control.

Franklin, W.L.; Johnson, W.E. **Hand capture of newborn open habitat ungulates: the South American guanaco.** *Wildlife Society Bulletin.* 1994; 22: 253-259.

URL: <http://www.wildlife.org/publications>

NAL call no.: SK357.A1W5

Descriptors: guanaco, neonates, wild animals, hand capture.

French, R.A.; Ashworth, C.D. **Zygomycosis caused by *Conidiobolus coronatus* in a llama (*Lama glama*).** *Veterinary Pathology.* Jan 1994; 31(1): 120-122. ISSN: 0300-9858.

NAL call no.: 41.8 P27

Descriptors: llamas, *Conidiobolus coronatus*, zygomycosis, pathogenic fungi.

Fritz, M.A.; Franklin, W.L. **First estimates of guanaco male group harvestability in the Patagonia of South America.** *Vida Silvestre Neotropical.* 1994; 3: 84-90.

Descriptors: guanaco, males, harvestability estimates, Patagonia, South America.

Galbreath, E.J.; Holland, R.E.; Trapp, A.L.; Baker-Belknap, E.; Maes, R.K.; Yamini, B.; Kennedy, F.A.; Gilardy, A.K.; Taylor, D. **Adenovirus-associated pneumonia and hepatitis in four llamas.** *Journal of the American Veterinary Medical Association.* Feb 1, 1994; 204(3): 424-426. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, pneumonia, Adenoviridae, liver cells, hepatitis, symptoms, case reports.

Garry, F. **Assessment of colic in llamas.** *Equine Practice.* Sept 1994; 16(8): 34-36. ISSN: 0162-8941.

NAL call no.: SF951.E62

Descriptors: llamas, colic, clinical examination, body condition, medical treatment.

Garry, F.; Weiser, M.G.; Belknap, E. **Clinical pathology of llamas.** *Veterinary Clinics of North America. Food Animal Practice.* July 1994; 10(2): 201-209. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, clinical examination, animal diseases, diagnosis, hematology, blood chemistry, IgG, urine analysis, normal values.

Genin, D.; Villca, Z.; Abasto, P. **Diet selection and utilization by llama and sheep in a high altitude-arid rangeland of Bolivia.** *Journal of Range Management.* May 1994; 47(3): 245-248. ISSN: 0022-409X.

NAL call no.: 60.18 J82

Descriptors: llamas, sheep, diet, feeding preferences, botanical composition, arid regions, high altitude, *Festuca orthophylla*, grasses, shrubs, species differences, digestibility, forage, voluntary intake, seasonal fluctuations, performance, Bolivia.

Abstract: Botanical composition of llamas and sheep diets were quantified monthly during 1 year in the arid highlands of Bolivia to identify competition between these species for forage resources. Results indicated higher proportions of coarse bunchgrasses in llamas diets (48 to 75%) than in sheep (37 to 68%), while sheep consumed more soft herbs and grasses than llamas (25 to 45%, and 8 to 25%, respectively). Llamas had higher ($P < 0.05$) digestion coefficients than sheep for organic matter, dry matter, crude protein, and fiber fractions of the principle bunchgrass *paja brava* (*Festuca orthophylla*) during the vegetative phenological stage. Shrubs represented less than 20% of the diet components in both llamas and sheep. A canonical discriminant analysis showed that there was not a strong dietary overlap between these species, and suggested that mixed herds could allow a better utilization of the overall available forage.

Gentz, E.J.; Pearson, E.G.; Lassen, E.D.; Snyder, S.P.; Sharpnack, E. **Polycythemia in a llama.** *Journal of the*

American Veterinary Medical Association. May 1, 1994; 209(9): 1490-1492. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, polycythemia, symptoms, diagnosis, erythropoietin, case reports.

Gionfriddo, J.R. **Ophthalmology**. *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 371-382. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, alpacas, vicunas, *Lama guanicoe*, eye diseases, eyelid diseases, eyes, clinical examination, animal anatomy, microbial flora.

Hart, Rosana. **Llamas for Love and Money**. 2nd ed. Juniper Ridge Press, Olympia, Wash. 1994. 174 p., ill. ISBN: 0916289192.

NAL call no.: SF401.L6H37 1994

Descriptors: llamas, livestock production, small farms.

Hutchinson, J.M.; Garry, F. **Ill thrift and juvenile llama immunodeficiency syndrome**. *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 331-343. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, young animal diseases, immunological deficiency, symptoms, epidemiology, clinical examination, immunology, postmortem examinations, diagnosis, failure to thrive.

Johnson, L.W. **Llama herd health**. *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 248-258. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, animal health, animal breeding, reproduction, newborn animals, vaccination, animal nutrition, veterinary services, pest control.

Johnson, L.W. **Llama nutrition**. *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 187-201. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, animal nutrition, animal feeding, young animals, growth, diet, nutrient content, body condition, nutrient requirements.

Johnson, LaRue W. **Update on llama medicine**. *The Veterinary Clinics of North America, Food Animal Practice*. 1994; 10(2): 187-438. ill. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas diseases, drugs, treatment.

Kramer, J.W.; Bowman, D.; Parish, S.; Tumas, D. **What is your diagnosis**. *Veterinary Clinical Pathology*. 1994; 23(2): 37, 46. ISSN: 0275-6382.

NAL call no.: SF601.A54

Descriptors: llamas, diagnosis, blood chemistry, symptoms, mycoses, hepatitis, immune competence.

Krieger, Maggie; Krieger, Richard. **Secrets of the Andean Alpaca: Assessing Fiber Characteristics and Conformation: the Field Guide**. Saltsping Island Llamas and Alpacas, Saltsping Island, B.C. [1994] xi, 116 p., ill. ISBN: 0969907400.

NAL call no.: SF401.A4K75 1994

Descriptors: alpaca conformation, breeding, fleece, wool.

Krieger, Richard; Krieger, Maggie. **In Search of the Ideal Llama: Assessing Conformational Traits in Llamas: the Field Guide**. Saltsping Island Llamas and Alpacas, Saltsping Island, B.C. [1994] xi, 100 p., ill. ISBN: 0969907419.

NAL call no.: SF401.L6K75 1994

Descriptors: llamas conformation, breeding, assessing conformation traits.

Leipold, H.W.; Hiraga, T.; Johnson, L.W. **Congenital defects in the llama**. *Veterinary Clinics of North America. Food*

Animal Practice. July 1994; 10(2): 401-420. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, congenital abnormalities, etiology, disease prevalence.

Mattson, D.E. **Viral diseases.** *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 345-351. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, alpacas, viral diseases, Adenoviridae, bluetongue virus, bovine diarrhea virus, contagious ecthyma virus, aphthovirus, Herpesviridae, paramyxovirus, diarrhea, retroviridae, vesicular stomatitis virus.

McGee, M. **Llama handling and training.** *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 421-434. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, animal husbandry, training of animals, restraint of animals, touch, injection, interactions, nail clipping, Tellington-Touch.

McGregor, B.A.; Victoria. Dept. of Agriculture. **Speciality fibre product development and marketing: report of a speciality fibre mission to Yorkshire, U.K. and Oklahoma, U.S.A., September and October 1993.** *Study Tour Report Series*, no. 158. ISSN: 0815-2373. Dept. of Agriculture, [Melbourne, Vic.?]. [1994] 36 p., ill. ISBN: 0730647897.

NAL call no.: TS1545.M34 1994

Descriptors: animal fibers marketing research, textile industry, United States, England, Australia, mohair, cashmere.

Morin, D.E.; Toenniessen, J.G.; French, R.A.; Knight, B.L.; Zachary, J.F. **Degenerative myeloencephalopathy in two llamas.** *Journal of the American Veterinary Medical Association*. Mar 15, 1994; 204(6): 938-943. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, myeloencephalopathy, symptoms, histopathology, diagnosis, treatment, case reports.

Ordonez, T.H. **Llamas, llama production and llama nutrition in the Ecuador highlands.** *Journal of Arid Environments*. Jan 1994; 26(1): 67-71. ISSN: 0140 1963.

NAL call no.: QH541.5.D4J6

Descriptors: llamas, animal husbandry, animal production, animal fibers, highlands, mountain areas, grazing, pasture plants, nutritive value, feed intake, birth, parturition, seasonal variation, age at first conception, Ecuador.

Potter, K.; Young, J.L. **Three cases of hepatic neoplasia in llamas.** *Veterinary Medicine*. Sept 1994; 89(9): 914-916. ISSN: 8750-7943.

NAL call no.: 41.8 M69

Descriptors: llamas, neoplasms, liver, lymphosarcoma, hepatoma, symptoms, diagnosis, case reports, hemangiosarcoma.

Pugh, D.G.; Baird, A.N.; Wolfe, D.E.; Wenzel, J.G.W.I.; Lin, H.C. **A prescrotal castration technique for llamas.** *Equine Practice*. Apr 1994; 16(4): 26-28. ISSN: 0162-8941.

NAL call no.: SF951.E62

Descriptors: llamas, castration, postoperative care.

Pugh, D.G.; Montes, A.J. **Advanced reproductive technologies in south American camelids.** *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 281-289. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, artificial insemination, semen preservation, embryos, cryopreservation, laparoscopy, embryo transfer, in vitro, fertilization.

Raggi, L.A.; Jiliberto, E.; Urquieta, B. **Feeding and foraging behaviour of alpaca in northern Chile.** *Journal of Arid Environments*. Jan 1994; 26(1): 73-77. ISSN: 0140-1963.

NAL call no.: QH541.5.D4J6

Descriptors: alpacas, feeding behavior, foraging, distance traveled, highlands, feed intake, Chile.

Rickard, L.D.; Smith, B.B.; Gentz, E.J.; Frank, A.A.; Pearson, E.G.; Walker, L.L.; Pybus, M.J. **Experimentally induced meningeal work (*Parelastrongylus tenuis*) infection in the llama (*Lama glama*): Clinical evaluation and implication for parasite translocation.** *Journal of Zoo and Wildlife Medicine*. September 1994; 25(3): 390-402. ill.
NAL call no.: SF601.J6

Descriptors: llamas, brain, spinal cord, effects, parasitic nematode, experimental infection, risk of translocation, *Parelastrongylus tenuis*.

Rickard, L.G. **Parasites.** *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 239-247. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, camelidae, parasitoses, Nematoda, Cestoda, Trematoda, Protozoa, arthropods, symptoms, diagnosis, treatment, North America.

Riebold, T.W.; Engel, H.N.; Grubb, T.L.; Adams, J.G.; Huber, M.J.; Schmotzer, W.B. **Orotracheal and nasotracheal intubation in llamas.** *Journal of the American Veterinary Medical Association*. Mar 1, 1994; 204(5): 779-783. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, trachea, endotracheal intubation, methodology, techniques, animal anatomy.

Rosadio, R.H.; Ameghino, E.F. **Coccidial infections in neonatal Peruvian alpacas.** *Veterinary Record (London)*. Nov 5, 1994; 135(19): 459-460. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: alpacas, newborn animals, coccidiosis, *Eimeria*, histopathology, case reports, Peru. *Eimeria macusaniensis*.

Rosychuk, R.A.W. **Llama dermatology.** *Veterinary Clinics of North America. Food Animal Practice*. July 1994; 10(2): 228-239. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, dermatology, skin diseases, symptoms, treatment.

Ruiz de Castilla Marin, Mario. **Raising Alpacas and Llamas in Southern Peru.** Municipalidad del Qosqo, Qosqo, Peru. 1994. 206 p., [11] leaves of plates, ill. (some col.).

NAL call no.: SF401.A4R85 1994

Descriptors: alpacas, llamas, Peru, management, livestock production systems.

Russel, A.J.F. **Fibre production from South American camelids.** *Journal of Arid Environments*. Jan 1994; 26(1): 33-37. ISSN: 0140-1963.

NAL call no.: QH541.5.D4J6

Descriptors: llamas, alpacas, *Lama guanicoe*, animal fibers, diameter, weight, agricultural production, seasonal variation, nutrient availability, fiber quality, protein synthesis, methionine, isotope labeling, tritium, animal husbandry.

Schmotzer, W.B.; M.J. Huber, M.J.; Frank, A.A.; Riebold, T.W.; Hollingshead, N.C.; Smith, B.B. **Evaluation of Janeway gastrostomy in llamas.** *American Journal of Veterinary Research*. Feb 1994; 55(2): 301-304. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, fistulation, forestomach, cannulae, complications.

Abstract: To provide long-term gastric fistulas for collection of third-compartment gastric contents, Janeway mucosal tube gastrostomy was performed, using a gastrointestinal stapling instrument, in 6 castrated adult male llamas. Mean operative time (+/- SEM) was 65 +/- 4.16 minutes. All llamas survived the 6-week study period. Of the 6 llamas, 5 did not have signs of abdominal pain and returned to preoperative food consumption amounts within 36 hours. One llama had mild intermittent signs of abdominal pain daily for 7 days before returning to preoperative amount of food consumption. All gastrostomies leaked small amounts of gastric contents around indwelling 6- to 8-mm cannulas at the skin surface. Gastric contents did not leak when cannulas were dislodged from gastrostomy stomas. Replacement of cannulas was rapid and easy. Gravity-flow sample collection was best accomplished through 8-mm cannulas. Mean (+/-

SEM) weight loss was detected in all llamas (15 +/- 3 kg) and was associated with frequent nonfeeding and stress of sample collection. Gross necropsy findings were unremarkable in 5 of 6 llamas. All mucosal tube gastrostomies were patent, and there was no evidence of peritonitis. One llama had a single fibrous adhesion connecting the operative site with the ascending colon. Histologically, small (2.5- to 15-mm diameter) partial-thickness mucosal erosions identified at the tube gastrostomy-gastric wall junctions may have been associated with indwelling gastric cannulas. The Janeway gastrostomy was generally well tolerated in the llamas and should be considered as a useful long-term fistulation technique.

Semrad, S.D. **Septicemic listeriosis, thrombocytopenia, blood parasitism, and hepatopathy in a llama.** *Journal of the American Veterinary Medical Association.* Jan 15, 1994; 204(2): 213-216. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, *Listeria monocytogenes*, thrombocytopenia, eperythrozoon, liver diseases, case reports.

Smith, B.B.; Pearson, E.G.; Timm, K.I. **Third compartment ulcers in the llama.** *Veterinary Clinics of North America. Food Animal Practice.* July 1994; 10(2): 319-330. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, stomach ulcer, animal anatomy, animal physiology, histopathology, pathogenesis, symptoms, diagnosis, antacids, treatment.

Smith, C.L.; Peter, A.T.; Pugh, D.G. **Reproduction in llamas and alpacas: a review.** *Theriogenology.* 1994; 41(3): 573-592. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, alpacas, corpus luteum, reproductive organs, sexual behavior, pregnancy diagnosis, embryo transfer, nutrient requirements, literature reviews.

Abstract: In this review we attempt to compile and summarize the diverse and often contradictory maternal presented on the reproduction of llamas and alpacas (hereafter referred to as lamoids). Lamoids have recently gained international popularity, and theriogenologists are often asked to intervene in clinical management of reproductive problems of these animals. We therefore present a discussion of the reproductive anatomy, physiology, and behavior of llamas as well as the follicular dynamics as observed with ultrasonography. The nonsurgical embryo transfer procedure and the nutrient requirements of llamas are also discussed.

Sumar, J. **Effects of various ovulation induction stimuli in alpacas and llamas.** *Journal of Arid Environments.* Jan 1994; 26(1): 39-45. ISSN: 0140-1963.

NAL call no.: QH541.5.D4J6

Descriptors: llamas, alpacas, estrus, ovulation, copulation, artificial insemination, mating behavior, LH, GnRH, spontaneous ovulation.

Tuckwell, Chris; Rural Industries Research and Development Corporation. **The Peruvian alpaca industry: a study tour report for RIRDC.** *Research Paper (Rural Industries Research and Development Corporation);* no. 94/8. Rural Industries Research and Development Corp., Canberra. c1994. 50 p., maps. ISBN: 0642204667.

NAL call no.: SF401.A4T83 1994

Descriptors: alpacas, breeding, wool industry, Peru.

Urquieta, B.; R. Cepeda, R.; Caceres, J.E.; Raggi, L.A.; Rojas, J.R. **Seasonal variation in some reproductive parameters of male vicuna in the High Andes of northern Chile.** *Journal of Arid Environments.* Jan 1994; 26(1): 79-87. ISSN: 0140-1963.

NAL call no.: QH541.5.D4J6

Descriptors: vicunas, testosterone, blood plasma, testes, diameter, seminiferous tubules, Leydig cells, seasonal variation, highlands, mountain areas, Chile.

Vila, B.L. **Aspects of play behaviour of vicuna, *Vicugna vicugna*.** *Small Ruminant Research.* Oct 1994; 14(3): 245-248. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: vicunas, calves, yearling animals, play, duration, diurnal activity, Argentina.

Welles, E.G.; Pugh, D.G.; Wenzel, J.G.W.; Sorjonen, D.C. **Composition of cerebrospinal fluid in healthy adult llamas.** *American Journal of Veterinary Research.* Aug 1994; 55(8): 1075-1079. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, cerebrospinal fluid, blood composition, chemical composition, osmotic pressure, lactate dehydrogenase, creatine kinase, enzyme activity, glucose, sodium, chloride, potassium, protein content, albumins, leukocyte count.

Abstract: Cerebrospinal fluid and serum were obtained from 17 adult, healthy llamas (9 males, 1 castrated male, and 7 females). Osmolality; activities of lactate dehydrogenase and creatine kinase; and concentrations of glucose, sodium, chloride, potassium, total protein, and albumin were determined in serum and CSF. Total and differential cell counts were determined in CSF, and electrophoresis of CSF proteins was performed. Total nucleated cell count was low, 0 to 3/microliter, which is lower than that reported for other domestic species and is similar to values in healthy people. Differential leukocyte percentages were disparate depending on the degree of blood contamination. Blood contamination influenced the percentage of neutrophils and eosinophils in CSF. Samples with few erythrocytes had differential leukocyte distribution similar to that of other species: mostly lymphocytes, fewer monocytoïd cells, and scant neutrophils. Older llamas had a few eosinophils in the CSF. Total protein, albumin, and gamma-globulin concentrations in llamas were similar to values in cattle and were higher than values in most domestic species. Glucose concentration in CSF was approximately 40% of the value in serum (nonruminant animals and people typically have CSF glucose concentration that is approximately 60 to 80% of the serum glucose concentration). Sodium and Cl concentrations in CSF were higher than those in serum, whereas K concentration was lower in CSF, compared with serum. Activities of creatine kinase and lactate dehydrogenase in CSF were markedly lower than those in serum, and the ranges of values in this group of healthy llamas were narrow.

Wilker, C.E.; Meyers-Wallen, V.N.; Schlafer, D.H.; Dykes, N.L.; Kovacs, A.; Ball, B.A. **XX sex reversal in a llama.** *Journal of the American Veterinary Medical Association.* Jan 1, 1994; 204(1): 112-115. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, sex reversal, karyotypes, genitalia, urinary incontinence, case reports.

Wilson, R.T. **Towards committed and collaborative camelid research.** *Journal of Arid Environments.* Jan 1994; 26(1): 95-103. ISSN: 0140-1963.

NAL call no.: QH541.5.D4J6

Descriptors: dromedary camels, alpacas, llamas, vicunas, agricultural research, research policy, research support, animal husbandry, animal production.

1993

Barrington, G.M.; Meyer, T.F.; Parish, S.M. **Standing castration of the llama using butorphanol tartrate and local anesthesia.** *Equine Practice.* May 1993; 15 (5): 35-39. ISSN: 0162-8941.

NAL call no.: SF951.E62

Descriptors: llamas, castration, local anesthesia.

Black-Schultz, L.L.; Hanson, P.D.; Wilson, D.G.; Markel, M.D. **Diaphragmatic hernia in a llama.** *Journal of the American Veterinary Medical Association.* Feb 1, 1993; 202(3): 410-412. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: llamas, diaphragm, hernia, case reports, symptoms, diagnosis.

Borchard, H. **Investing in llamas.** *Small Farm Today.* Aug 1993; 10(4): 44-45.

NAL call no.: S1.M57

Descriptors: llamas, animal breeding, private investment.

Bravo, P.W.; Stabenfeldt, G.H.; Fowler, M.E.; Lasley, B.L. **Ovarian and endocrine patterns associated with reproductive abnormalities in llamas and alpacas.** *Journal of the American Veterinary Medical Association.* Jan 15, 1993; 202(2): 268-272. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: llamas, alpacas, reproductive disorders, ovaries, pituitary, LH, hormone secretion, follicles, estrone.

Burkhardt, J.E.; Janovitz, E.B.; Bowersock, T.L.; Higgins, R. **Septicemic Enterococcus infection in an adult llama.**

Journal of Veterinary Diagnostic Investigation. Jan 1993; 5(1): 106-109. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, enterococcus.

Bustanza-Choque, Victor; Universidad Nacional del Altiplano. Escuela de Postgrado. Instituto de Investigacion y Promocion de Camelidos Sudamericanos. **Alpaca meat.** *Coleccion Desarrollo Rural.* Universidad Nacional del Altiplano, Escuela de Postgrado, Maestria en Ganaderia Andina: Instituto de Investigacion y Promocion de Camelidos Sudamericanos, IIPC, Facultad de Medicina Veterinaria y Zootecnia, [Puno, Peru]. c1993. 140 p., ill.

NAL call no.: SF401.A4C37 1993

Descriptors: alpaca, meat industry and trade, Peru.

Chang, C.D.; Boosinger, T.R.; Dowling, P.M.; McRae, E.E.; Tyler, J.W.; Pugh, D.G. **Nocardiosis in a llama.** *Journal of Veterinary Diagnostic Investigation.* Oct 1993; 5(4): 631-634. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, *Nocardia asteroides*.

Franklin, W.L. **Camels and llamas.** In: D. MacDonald (Editor). *The Encyclopedia of Mammals.* Andromedia Oxford Ltd. Press, Oxford. 1993.

Descriptors: camels, llamas, taxonomic relationships, genus, species, descriptions of species, ranges, distribution, natural history.

Grubb, T.L.; Reibold, T.W.; Huber, M.J. **Evaluation of lidocaine, xylazine, and a combination of lidocaine and xylazine for epidural analgesia in llamas.** *Journal of the American Veterinary Medical Association.* Nov 15, 1993; 203(10): 1441-1444. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, lidocaine, xylazine, drug combinations, conduction anesthesia, duration, pulse rate, respiration rate.

Hildebrand, S.V.; Hill, T. **III Neuromuscular blockade by use of atracurium in anesthetized llamas.** *American Journal of Veterinary Research.* Mar 1993; 54(3): 429-433. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: llamas, anesthesia, muscle relaxants, dosage, boluses, intravenous injection, adverse effects.

Abstract: Anesthesia was induced in 8 healthy llamas by administration of guaifenesin and ketamine, and was maintained with halothane in oxygen. On 2 separate experimental days, atracurium was given to induce 95 to 99% reduction of evoked hind limb digital extensor tension (twitch). For the first part of the study, atracurium was given iv as repeat boluses, with muscle twitch strength being allowed to return without intervention to 75% of baseline after each bolus before the subsequent bolus was given. A total of 5 bolus doses of atracurium was given. For the first bolus, 0.15 mg/kg of body weight iv, and for subsequent boluses, 0.08 mg/kg, induced desired relaxation. Onset of relaxation was slightly more rapid for repeat, compared with initial, bolus. Duration of relaxation and recovery time were similar to initial and repeat doses. Maximal twitch reduction was observed in 4 +/- 0.2 minutes (mean +/- SEM). Duration from maximal twitch reduction to 10% recovery was 6.3 +/- 0.4 minutes. Twitch recovery from 10 to 50% of baseline took 11.6 +/- 0.6 minutes. Twitch recovery from 10 to 75% recovery took 19.5 +/- 1.1 minutes. Recovery from 10% twitch to 50% fade took 12.8 +/- 0.5 minutes. Fade at 50% recovery of twitch was 39 +/- 0.02%. Significant (P < 0.05) animal-to-animal variation was observed in twitch recovery times. For the second part of the study, atracurium was initially given IV as a 0.15-mg/kg bolus, followed by infusion for 1 to 2 hours. Infusion rate required some early adjustment to maintain desired relaxation, but the rate that prevailed was 1.07 +/- 0.07 ml/kg/h (0.4 mg of atracurium/ml of saline solution). Recovery of muscle twitch was similar to that previously mentioned for repeat bolus administration. At the end of the study, edrophonium (0.5 mg/kg) with atropine (0.01 mg/kg, IV) was effective in antagonizing residual neuromuscular blockade by atracurium. All llamas recovered without injury from anesthesia, although 1 llama had a rough recovery. It was concluded that atracurium can provide neuromuscular blockade by either repeat bolus administration or continuous infusion in llamas.

Hutchison, J.M.; Belknap, E.B.; Williams, R.J. **Acute renal failure in the llama (*Lama glama*).** *Cornell Veterinarian*. Jan 1993; 83(1): 39-46. ISSN: 0010-8901.

NAL call no.: 41.8 C81

Descriptors: llamas, renal failure, aminoglycoside antibiotics.

Iason, G.R.; Elston, D.A.; Sim, D.A. **Ultrasonic scanning for determination of stage of pregnancy in the llama (*Lama glama*): a critical comparison of calibration techniques.** *Journal of Agricultural Science*. June 1993; 120(pt. 3): 371-377. ISSN: 0021-8596.

NAL call no.: 10 J822

Descriptors: llamas, fetal development, pregnancy, ultrasonic diagnosis, analysis of variance, prediction.

Johnson, C.T.; Winkler, C.E.; Boughton, E.; Penfold, J.W.F. ***Mycobacterium kansasii* infection in a llama.** *Veterinary Record* (London). Sept 4, 1993; 133(10): 243-244. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, *Mycobacterium kansasii*, bacterial infection.

McLaughlin, B.G.; Greer, S.C.; Singh, S. **Listerial abortion in a llama.** *Journal of Veterinary Diagnostic Investigation*. Jan 1993; 5(1): 105-106. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, abortion, *Listeria monocytogenes*.

McLaughlin, B.G.; Evans, C.N.; Colton, R.L. **Serum triiodothyronine and thyroxine concentrations in neonatal llamas.** *Journal of Veterinary Diagnostic Investigation*. Apr 1993; 5(2): 208-211. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, thyroid hormones, newborn animals.

Morin, D.E.; Garry, F.B.; Weiser, M.G. **Hematologic responses in llamas with experimentally-induced iron deficiency anemia.** *Veterinary Clinical Pathology*. Sept 15, 1993; 22(3): 81-88. ISSN: 0275-6382.

NAL call no.: SF601.A54

Descriptors: llamas, iron deficiency anemia, hematology.

Pugh, D.G. **Polioencephalomalacia in a llama herd.** *Equine Practice*. Feb 1993; 15 (2): 24-26. ISSN: 0162-8941.

NAL call no.: SF951.E62

Descriptors: llamas, polioencephalomalacia.

Sell, Randall S.; Aakre, Dwight G. **Llama.** *Alternative Agriculture Series*. NDSU Extension Service, North Dakota State University, Fargo, ND. 1993; no. 12, ill., map, 4 p.

NAL call no.: S494.5.A65S44 no. 12

Descriptors: llamas, uses, pets, companions, pack animal, low cost maintenance, wool fiber, sheep guards, populations in the United States, physical attributes, size, weight, colors, feeds, nutrition, reproduction, diseases and parasites, marketing in the United States, International Llama Association, economics, housing facilities and fencing, 15 herd production example for North Dakota.

Shepherd, G.; Petrie, L.; Naylor, J.M. **Metabolic acidosis without dehydration in a llama cria.** *Canadian Veterinary Journal*. July 1993; 34(7): 425-427. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: llamas, acidosis.

Smith, B.B. **Major infectious and non-infectious diseases of the llama and alpaca.** *Veterinary and Human Toxicology*. 1993; 35(suppl. 2): 33-39. ISSN: 0145-6296.

NAL call no.: SF601.A47

Descriptors: llamas, alpacas, animal diseases.

St. Jean, G.; Anderson, D.E.; Anderson, N.V.; Hoskinson, J. **Abdominal pain associated with an umbilical abscess in a llama.** *Cornell Veterinarian*. Jan 1993; 83(1): 77-81. ISSN: 0010-8901.

NAL call no.: 41.8 C81

Descriptors: llamas, abscesses, umbilicus.

Stenzel, D.J.; Cassidy, M.F.; Boreham, P.F.L. **Morphology of *Blastocystis* sp. isolated from circus animals.**

International Journal of Parasitology. Aug 1993; 23(5): 685-687. ISSN: 0020-7519.

NAL call no.: QH547.I55

Descriptors: circus animals, camels, llamas, lions, bulls, *Blastocystis*, ultrastructure, protozoal infections.

Abstract: *Blastocystis* sp. is reported for the first time from faecal samples collected from a camel, a llama, a highland bull and a lion in a travelling circus. Fresh faecal specimens were examined by light and electron microscopy, and vacuolar and cyst forms of similar morphology were present in all three ungulates. These cells were smaller than cultured vacuolar cells of *Blastocystis hominis* isolated from humans and contained only a single vacuole in comparison to the multivacuolar cell found in fresh human faeces. The taxonomic relationship of *Blastocystis* isolated from humans and ungulates remains to be determined. The number of parasites present in the lion sample was too small to make valid comparisons.

Stone, W.C.; Lindsay, W.A.; Adams, G.P.; Galbreath, E.J.; Bjorling, D.E. **Rectal and colonic injury in the llama.**

Anatomic considerations and surgical management in four llamas. *Veterinary Surgery.* Jan/Feb 1993; 22(1): 62-66. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: llamas, wounds, rectum, colon, surgery, peritoneum, feces, Wisconsin, Saskatchewan.

Sumar, J.; Bravo, P.W.; Foote, W.C. **Sexual receptivity and time of ovulation in alpacas.** *Small Ruminant Research.*

July 1993; 11(2): 143-150. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: alpacas, sexual behavior, ovulation, age differences.

Thedford, T.R. **Some general information for the potential llama owner.** *OSU Extension Facts* [Oklahoma State University]. Nov 1993. (F-9122) 2 p. ISSN: 0473-6885.

NAL call no.: S544.3.O5O5

Descriptors: llamas, alpacas, animal behavior, pets, meat animals, reproduction, animal breeding.

Underwood, W.J.; Bell, T.G. **Multicentric lymphosarcoma in a llama.** *Journal of Veterinary Diagnostic Investigation.*

Jan 1993; 5(1): 117-121. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, lymphosarcoma.

Wacker, L. **Alpacas: high investment reaps high return.** *Small Farm Today.* June 1993; 10(3): 50-51.

NAL call no.: S1.M57

Descriptors: alpacas, production possibilities, potential investment returns, United States.

Weldon, A.D. **Identifying a periesophageal hematoma as the cause of choke in a llama.** *Veterinary Medicine.* Oct 1993; 88(10): 1009-1011. ISSN: 8750-7943.

NAL call no.: 41.8 M69

Descriptors: llamas, hematoma, esophagus, obstruction, case reports, blood specimen collection, jugular vein, complications.

1992

Adams, R.; Garry, F.B. **Gram-negative bacterial infection in neonatal New World camelids: six cases (1985-1991).**

Journal of the American Veterinary Medical Association. Nov 1, 1992; 201(9): 1419-1424. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, newborn animals, gram negative bacteria, bacterial diseases, symptoms, *Escherichia coli*, *Actinobacillus*, *Klebsiella pneumoniae*, diagnosis, blood chemistry, case reports.

Aida, Y.; Okada, K.; Kageyama, R.; Amanuma, H. **Cross-reactivity between a monoclonal antibody that recognizes a tumor-associated antigen on bovine lymphosarcoma cells and blood lymphocytes from various mammalian species.** *American Journal of Veterinary Research*. Nov 1992; 53(11): 1988-1991. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: man, mice, dogs, horses, pigs, sheep, llamas, goats, cattle, monoclonal antibodies, lymphocytes, flow cytometry.

Abstract: Tumor-associated antigens that are expressed in lymphosarcoma B cells of cattle with enzootic bovine leukosis had been analyzed in terms of their reactivity with 13 monoclonal antibodies (MAB). By use of flow cytometry and radioimmuno precipitation, 1 of the MAB (c143) that recognized a tumor-associated antigen cross-reacted with blood lymphocytes (BL) from various mammalian species. By use of flow cytometry, the c143 MAB reacted with 10 to 49% of BL derived from human beings, mice, dogs, horses, pigs, llamas, sheep, goats, and cattle. Titer of the c143 MAB with BL from horses, pigs, human beings, and llamas ranged between 1:6.0 X 10(4) and 1:5.3 X 10(5); titer associated with BL of goats and sheep was 1:1.6 X 10(6); and that associated with BL of cattle was 1:4.3 X 10(7). The c143 MAB specifically immunoprecipitated 3 homous proteins from cell extracts of caprine, ovine, and bovine BL (32-, 34-, and 36- to 37-kDa bovine proteins; 31-, 32-, and 36- to 37-kDa caprine proteins; and 31.5-, 33-, and 36- to 37-kDa ovine proteins), but none was immunoprecipitated from human, murine, canine, porcine, and llama BL. These results indicate that the avidity of the c143 MAB in binding to BL from ruminants (eg, goats, sheep, and cattle) is higher than that to BL from human beings, mice, dogs, horses, pigs, and llamas. In sheep, the c143 MAB could immunoprecipitate the aforementioned proteins from BL of the Suffolk breed, but not BL from the Corriedale breed, whereas the c143 MAB immunoprecipitated apparently identical proteins from BL of 4 breeds of cattle.

Al Ani, F.K.; Al Azzawi, W.A.R.A.; Jermukly, M.S.; Razzaq, K.K. **Studies on some haematological parameters of camel and llama in Iraq.** *Bulletin of Animal Health and Production, Bulletin des Sante et Production Animales Afrique*. June 1992; 40(2): 103-106. ISSN: 0378-9721.

NAL call no.: 41.8 B872

Descriptors: camels, llamas, hematology, blood picture, normal values, female animals, Iraq.

American Association of Small Ruminant Practitioners. Western Regional Coordinating Committee, 46. Colorado Veterinary Medical Association. **Proceedings of the 1992 Symposium on the Health and Disease of Small Ruminants: June 10-12, 1992, Fort Collins, Colorado.** American Association of Small Ruminant Practitioners, Ithaca, NY. [1992] iv, 135 p., ill.

NAL call no.: SF968.S97 1992

Descriptors: ruminants, diseases, congresses, sheep, llamas, variety of topics.

Borchard, H. **Harvesting llama wool.** *Small Farm Today*. Aug 1992; 9(4): 34.

NAL call no.: S1.M57

Descriptors: llamas, alpacas, wool, fleece processing.

Bourke, D.A.; Adam, C.L.; Kyle, C.E. **Ultrasonography as an aid to controlled breeding in the llama (*Lama glama*).** *Veterinary Record* (London). May 9, 1992; 130(19): 424-428. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, ultrasonography, reproductive physiology, Graafian follicles, ovulation, corpus luteum, pregnancy, pregnancy diagnosis.

Bravo, P.W.; Stabenfeldt, G.H.; Fowler, M.E.; Lasley, B.L. **Pituitary response to repeated copulation and/or gonadotropin-releasing hormone administration in llamas and alpacas.** *Biology of Reproduction*. Nov 1992; 47(5): 884-888. ISSN: 0006-3363.

NAL call no.: QL876.B5

Descriptors: llamas, alpacas, copulation, GnRH, pituitary, LH, hormone secretion, Peru.

Abstract: The response of the pituitary gland and ovary to repeated copulatory periods and/or gonadotropin-releasing hormone (GnRH, i.v. 1000 micrograms) administration was determined in llamas and alpacas. Eighty adult females (41 llamas and 39 alpacas with ovulatory follicles) were divided into three general groups for each species as follows: copulation (one or two copulations at either 6- or 24-h intervals) GnRH treatment (one or two treatments at either 6- or 24-h intervals), and combined treatment (copulation followed by GnRH treatment, or GnRH followed by copulation at

either 6- or 24-h intervals). An additional control (nontreated) group was composed of 4 llamas and 4 alpacas. The first copulation or treatment with GnRH provoked LH release sufficient to cause ovulation in most of the females alpacas, 89%; llamas, 92%); urinary pregnanediol glucuronide values, used to verify, ovulation, were significantly elevated 48 h after copulation and/or GnRH treatment. A second stimulus, copulation or GnRH, provoked no LH response with concentrations similar to those in nontreated controls and in females not ovulating. Llamas and alpacas thus were refractory to a second copulatory or GnRH stimulus with regard to LH release for up to 24 h following an initial ovulatory release of LH.

Bridges, C. **Alpaca Farming**. In: *Exotic Alternatives an Insight into Other Farming Ventures, Deer Farming, Sheep Dairying, Yabby Farming, Ostrich Farming, Alpaca Farming*. Agmedia: Dept. of Agriculture; [Geelong]: GOTEC, Melbourne, Vic. c1992. p. 51-56. ISBN: 0730622487.

NAL call no.: SF55.A8E96 1992

Descriptors: alpacas, wool production, animal husbandry, shearing.

Bruhn, Sharliss; Parkland Llama & Alpaca Club; Northern Alberta Llama Club; Chinook Llama Club. **Llamas: Why are They so Popular?** Parkland Llama & Alpaca Club, Blackfalds, AB. c1992. 30 p., ill. (some col.).

NAL call no.: SF401.L6L63 1992

Descriptors: llamas, anecdotal information, popularity.

Carmean, B.R.; Johnson, K.A.; Johnson, D.E.; Johnson, L.W. **Maintenance energy requirement of llamas**. *American Journal of Veterinary Research*. Sept 1992; 53(9): 1696-1698. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: llamas, energy requirements, energy cost of maintenance, metabolizable energy, feces, urine, heat production, methane.

Donaldson, L.L.; Holland, M.; Koch, S.A. **Atracurium as an adjunct to halothane-oxygen anesthesia in a llama undergoing intraocular surgery: a case report**. *Veterinary Surgery*. Jan 1992; 21(1): 76-79. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: llamas, anesthesia, surgical operations, eyes, halothane, oxygen, case reports.

Drew, M.L.; Ramsay, E.; Fowler, M.E.; Kass, P.H. **Effect of flunixin meglumine and cimetidine hydrochloride on the pH in the third compartment of the stomach of llamas**. *Journal of the American Veterinary Medical Association*. Nov 15, 1992; 201(10): 1559-1563. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, flunixin, cimetidine, drug effects, pH, stomach, gastric ulcer.

Egri, B.; Krepsz, G. **Nematode infection and its therapy in some zoo animals**. *Parasitologia Hungarica*. 1992 (pub. 1993) v. 25. ref.

NAL call no.: QL757 P3722

Descriptors: llamas, bison, other ruminants, zoo situation, drug efficacy, Vermitan paste, albenazole, parasitic nematodes.

Abstract: A 1990 survey of the gastrointestinal nematodes and level of infection were done on some ruminant species in the zoo of Gyor, Hungary. Sixteen animals were treated with Vermitan paste containing albendazole.(10mg/kg bwt) in their food (apple, carrot, and bread). Fecal samples were collected. They contained mostly the eggs of *Trichostrongylus* and *Haemonchus*. Other species found in binson were eggs of *Strongyloides papillosus*, *Toxocara vitulorum*, *Trichuris ovis*, *Cooperia* and *Nematodirus*. The numbers of eggs decreased after treatment.

Fowler, M.E.; Pappagianis, D.; Ingram, I. **Coccidioidomycosis in llamas in the United States: 19 cases (1981-1989)**. *Journal of the American Veterinary Medical Association*. Nov 15, 1992; 201(10): 1609-1614. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, coccidioidomycosis, *Coccidioides immitis*, symptoms, diagnosis, susceptibility, California, Arizona.

Gionfriddo, J.R.; Gabal, M.A.; Betts, D.M. **Fungal flora of the healthy camelid conjunctival sac**. *American Journal of Veterinary Research*. May 1992; 53(5): 643-645. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: llamas, alpacas, *Lama guanicoe*, conjunctiva, fungi, microbial flora, seasonal variation, western states, United States.

Abstract: Swab specimens for fungal isolation were collected from the healthy conjunctival sacs of 3 species of captive camelids (*Lama glama*, *Lama guanicoe*, *Lama pacos*) and llama-guanaco hybrids. Fungi were collected from over half the animals in winter (53%) and summer (56%). Fungal species of 10 genera were isolated. In both seasons, *Aspergillus* was the most commonly isolated genus; at least 9 species of *Aspergillus* were found. The fungal organisms isolated were similar to those found in healthy eyes of other domestic animals and may represent a random seeding from the environment where they are ubiquitous.

Hajduk, P. **Haematological reference values for alpacas.** *Australian Veterinary Journal*. Apr 1992; 69 (4): 89-90. ISSN: 0005-0423.

NAL call no.: 41.8 AU72

Descriptors: alpacas, hematology, normal values, reference standards, blood picture.

Hutchison, J.M.; Garry, F.B.; Johnson, L.W.; Quakenbush, S.L.; Getzy, D.M.; Jensen, W.A.; Hoover, E.A.

Immunodeficiency syndrome associated with wasting and opportunistic infection in juvenile llamas: 12 cases (1988-1990). *Journal of the American Veterinary Medical Association*. Oct 1, 1992; 201(7): 1070-1076. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, immunological deficiency, young animals, symptoms, T lymphocytes, B lymphocytes, body condition, opportunistic infections, histopathology, medical treatment.

Johnson, L.W.; Cheny, J.M.; Taton, G.; Getzy, D.M. **Use of Ivermectin (Ivomec) topically in llamas.** In: *Proceedings of the 1992 Symposium on the Health and Disease of Small Ruminants: June 10-12, 1992, Fort Collins, Colorado*. American Association of Small Ruminant Practitioners, Ithaca, NY. [1992] iv, 135 p., ill.

NAL call no.: SF968.S97 1992

Descriptors: ruminants, diseases, congresses, sheep, llamas, Ivermectin treatment, drug efficacy.

Lanigan, B. **Financial Considerations.** In: *Exotic Alternatives an Insight into Other Farming Ventures, Deer Farming, Sheep Dairying, Yabby Farming, Ostrich Farming, Alpaca Farming*. Agmedia: Dept. of Agriculture; [Geelong]: GOTEK, Melbourne, Vic. c1992. p. 59-68. ISBN: 0730622487.

NAL call no.: SF55.A8E96 1992

Descriptors: primary sector, income tax, production costs, farm accounting, profitability, Australia.

Leichty, M.D.; Davis, I.A. **Llama failure to thrive syndrome.** *Iowa State University Veterinarian*. 1992; 54(2): 78-81. ISSN: 0099-5851.

NAL call no.: 41.8 V6425

Descriptors: llamas, failure to thrive, immunological deficiency.

McGee, M. **Llama training: the TTeam approach.** *Humane Innovations and Alternatives*. 1992; 6: 339-343. ISSN: 1062-4805.

NAL call no.: QL55.H8

Descriptors: llamas, training of animals, animal welfare.

Marvin-Sikkema, F.D.; G.A. Lahpor; M.N. Kraak; J.A. Gottschal; R.A. Prins. **Characterization of an anaerobic fungus from llamas faeces.** *Journal of General Microbiology*. Oct 1992; 138 (pt. 10): 2235-2241. ISSN: 0022-1287.

NAL call no.: 448.3 J823

Descriptors: llamas, feces, *Neocallimastix*, anaerobes, identification, fungal morphology, ultrastructure, metabolism.

Abstract: An anaerobic fungus was isolated from llama faeces. Based on its morphological characteristics, polyflagellated zoospores, extensive rhizoid system and the formation of monocentric colonies, the fungus is assigned to the genus *Neocallimastix*. *Neocallimastix* sp. L2 is able to grow on several poly-, oligo- and monosaccharides. It differs from other *Neocallimastix* isolates in its inability to ferment inulin. *Neocallimastix* sp. L2 requires CO₂ for growth. In the presence of 100% CO₂ in the gas phase glucose is fermented to H₂, CO₂ formate, acetate, lactate,

succinate and ethanol (33.8, 15.4, 74.3, 69.2, 26.7, 8.2, and 28.7 mmol per 100 mmol glucose, respectively). Reduced sulphur compounds can be used as sulphur source and ammonium or amino acids as nitrogen source. The temperature range for glucose fermentation is from 37 to 42 degrees C with an optimum of around 38 degrees C. The pH range for glucose fermentation is from pH 6 to pH 8 with a broad optimum between pH 6.5 and pH 7.5. The zoospores of *Neocallimastix* sp. L2 contain ribosomal 'globules' and hydrogenosomes. In the kinetosomes of the zoospores spurs, scoops and skirts are visible. In both the rhizoids and the sporangia 'crystal bodies' and hydrogenosomes are present. Mitochondria were not detected in either of these life stages.

Moll, H.D.; J. Schumacher, J.; Hoover, T.R. **Entomophthoramycolosis conidiobolae in a llama.** *Journal of the American Veterinary Medical Association.* Apr 1, 1992; 200(7): 969-970. ISSN: 0003-1488

NAL call no.: 41.8 AM3

Descriptors: llamas, *Conidiobolus coronatus*, nose, skin diseases, mycoses, case reports, surgery.

Morgan, K.L. **Ataxia and head tremor in an alpaca (*Lama pacos*).** *Veterinary Record* (London). Sept 5, 1992; 131(10): 216-217. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: alpacas, ataxia, diagnosis, medical treatment.

Morin, D.E.; Garry, F.B.; Weiser, M.G.; Fettman, M.J.; Johnson, L.W. **Hematologic features of iron deficiency anemia in llamas.** *Veterinary Pathology.* Sept 1992; 29(5): 400-404. ISSN: 0300-9858.

NAL call no.: 41.8 P27

Descriptors: llamas, anemia, iron deficiency anemia, hematology, diagnosis.

NATURE. **Treasure of the Andes: Llamas, Alpacas, Guanacos, Vicunas.** 1992. Identification Number: ASIN B00000F0M2 (Amazon.com). Note: William L. Franklin was a Scientific Consultant for the development of this video.

Descriptors: South American camelids, llamas, alpacas, guanacos, vicunas, taxonomic relationships, domesticated animals, wild animal natural resources, uses, behaviors, species comparisons, habitats, human/animal interactions, economic value, historical uses, South America.

Rickard, L.G.; Foreyt, W.J. **Experimental fascioliasis in llamas.** *Journal of the Helminthological Society of Washington.* Jan 1992; 59(1): 140-144. ISSN: 1049-233X.

NAL call no.: QL392.J68

Descriptors: sheep, llamas, *Fasciola hepatica*, experimental infection, disease resistance, liver flukes.

Rickard, L. **Llama parasites.** *Large Animal Veterinarian Covering Health and Nutrition.* Mt. Morris, IL: Watt Publishing Co. Sept/Oct 1992; 47(5): 6, 8, 10, 13. ISSN: 1043-7533.

NAL call no.: SF740.A54

Descriptors: llamas, *Eimeria*, helminths, helminthoses, dosage, anthelmintics, diagnosis, coccidiostats, ectoparasites, mange, mites, tick infestations, tick paralysis, arthropods, symptoms, insecticides.

Sapienza, J.S.; Isaza, R.; Johnson, R.D.; Miller, T.R. **Anatomic and radiographic study of the lacrimal apparatus of llamas.** *American Journal of Veterinary Research.* June 1992; 53(6): 1007-1009. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, lacrimal duct, animal anatomy.

Abstract: The anatomy of the nasolacrimal duct of llamas was examined grossly and radiographically in 2 llamas. Dacryocystorhinography was performed on cadaver heads, using a radiographic aqueous contrast agent. Anatomic casts of the nasolacrimal apparatus were obtained by cannulation of the duct and use of polyurethane cast material. Dacryocystorhinography accurately revealed the nasolacrimal apparatus and compared favorably with gross dissections and polyurethane casts.

Sheaffer, D.S.; Kersting, K.W. **Neonatology of South American Camelids.** *Iowa State University Veterinarian.* 1992; 54(1): 37-42. ISSN: 0099-5851.

NAL call no.: 41.8 V6425

Descriptors: llamas, newborn animals, size, weight, behavior, characteristics.

Tomka, S.A. **Vicunas and llamas: parallels in behavioral ecology and implications for the domestication of Andean camelids.** *Human Ecology*. Dec 1992; 20(4): 407-433. ISSN: 0300-7839.

NAL call no.: HM206.A1H8

Descriptors: Andean Camelidae, llamas, vicunas, pastoralism, domestication, ecology, animal behavior, Bolivia.

Underwood, W.J.; Morin, D.E.; Mirsky, M.L.; Haschek, W.M.; Zuckermann, F.A.; Petersen, G.C.; Scherba, G. **Apparent retrovirus induced immunosuppression in a yearling llama.** *Journal of the American Veterinary Medical Association*. Feb 1, 1992; 200(3): 358-362. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, retroviridae, viral immunosuppression, case reports, symptoms.

Van Houten, D.; Weiser, M.G.; Johnson, L.; Garry, F. **Reference hematologic values and morphologic features of blood cells in healthy adult llamas.** *American Journal of Veterinary Research*. Oct 1992; 53(10): 1773-1775. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, hematology, normal values, blood cells, morphology, hematocrit, leukocyte count.

Abstract: Hematologic values and cellular morphologic features were evaluated for 38 healthy adult llamas. Reference ranges were determined for PCV, reticulocyte concentration, leukocyte concentration, and leukocyte differential counts. The approach used in this study was to focus on hematologic values that may be determined by use of techniques readily available to the practicing veterinarian and nonveterinary laboratory. Unique cellular morphologic features commonly observed and interpreted as normal included large granular lymphocytes, hyposegmented eosinophil nuclei, folded erythrocytes, and hemoglobin crystals.

Vila, B.L.; Roig, V.G. **Diurnal movements, family groups and alertness of vicuna (*Vicugna vicugna*) during the late dry season in the Laguna Blanca Reserve (Catamarca, Argentina).** *Small Ruminant Research*. June 1992; 7(4): 289-297. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: vicunas, dry season, diurnal activity, family structure, drinking behavior, grazing behavior, young animals, walking, social behavior, alert behavior, Argentina.

Vila, B.L. **Mother-offspring relationship in the vicuna, *Vicugna vicugna* (Mammalia: Camelidae).** *Ethology*. Dec 1992; 92(4): 293-300. ISSN: 0179-1613.

NAL call no.: QL750.E74

Descriptors: vicunas, attachment behavior, maternal behavior, offspring behaviors.

Wacker, L. **Llama seminar a success.** *Small Farm Today*. Aug 1992; 9(4): 32-33.

NAL call no.: S1.M57

Descriptors: llamas, livestock farming, livestock enterprises, Missouri.

Wallace, L.L.M.; Halenda, R.; Turk, J.R.; Ross, L.M. Jr. **Gastric perforation and peritonitis resulting from gastrolithiasis in a llama.** *Veterinary Medicine*. Jan 1992; 87(1): 14, 16, 18-19. ISSN: 8750-7943.

NAL call no.: 41.8 M69

Descriptors: llamas, concretions, stomach diseases, stomach, rupture, peritonitis, case reports, drug therapy, antiinflammatory agents, gastric calculi.

Weiser, M.G.; Fettman, M.J.; Van Houten, D.; Johnson, L.; Garry, F. **Characterization of erythrocytic indices and serum iron values in healthy llamas.** *American Journal of Veterinary Research*. Oct 1992; 53(10): 1776-1779. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: llamas, erythrocytes, blood serum, iron, normal values, cell counting, size, volume, hemoglobin value, iron binding capacity, morphology.

Abstract: An electronic particle counter with attached particle size analyzer was configured to directly determine concentration, mean cell volume, and volume distribution of erythrocytes in llama blood. Blood from 38 healthy llamas

was used to characterize erythrocytic measurements and serum iron values for this species. Volume distribution curves for llama erythrocytes were similar in shape to those of other species. These curves had a unimodal, symmetric shape with a tail skewed to the right. Reference ranges for directly measured mean cell volume, erythrocyte concentration, hemoglobin concentration, and mean cell hemoglobin concentration were 21 to 28 fl, 11.3 X to 17.5 X 10⁶ cells/microl, 12.8 to 17.6 g/dl, and 43.2 to 46.6 g/dl, respectively. Reference ranges for serum iron concentration, total iron-binding capacity, and transferrin saturation were determined to be 70 to 148 microg/dl, 230 to 370 micro g/dl, and 22 to 50%, respectively.

Whitehair, K.J.; Adams, S.B.; Toombs, J.P.; Parker, J.E.; Prostedny, J.M.; Whitehair, J.G.; Aiken, S.W. **Arthrodesis for congenital flexural deformity of the metacarpophalangeal and metatarsophalangeal joints.** *Veterinary Surgery*. May/June 1992; 21(3): 228-233. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: donkeys, horses, llamas, metatarsus, metacarpus, phalanges, joints animal, deformities, skeletomuscular anomalies, surgery, adverse effects, case reports, external skeletal fixation, dynamic compression plating.

Windsor, R.S.; Windsor, R.H.S.; Teran, M. **Economic benefits of controlling internal and external parasites in South American camelids.** *Annals of the New York Academy of Sciences*. 1992; 653(1): 398-405. ISSN: 0077-8923.

NAL call no.: 500 N484

Descriptors: alpacas, llamas, cost benefit analysis, *Fasciola hepatica*, helminth ova, insect pests, Phthiraptera, pest control, Peru.

Windsor, R.H.S.; Teran, M.; Windsor, R.S. **Effects of parasitic infestation on the productivity of alpacas (*Lama pacos*).** *Tropical Animal Health and Production*. Feb 1992; 24(1): 57-62. ISSN: 0049-4747.

NAL call no.: SF601.T7

Descriptors: alpacas, ivermectin, parasites, infestation, mange, phthiraptera, helminth ova, feces, liveweight gain, fleece weight, cost benefit analysis, Microthoracious praelongiceps, Peru

1991

Adams, G.P.; Sumar, J.; Ginther, O.J. **Hemorrhagic ovarian follicles in llamas.** *Theriogenology*. Mar 1991; 35(3): 557-568. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, follicles, hemorrhage, ovaries, morphology, ultrasonics.

Abstract: The ovaries of 74 llamas were examined daily by transrectal ultrasonography for at least 30 d. Hemorrhagic follicles were observed in 13 (18%) llamas (incidence per anovulatory dominant follicle, 16%). The proportion of llamas in which a hemorrhagic follicle was detected was different among groups (nonmated, 8/25; mated to a vasectomized male, 4/21; mated to an intact male, nonpregnant, 1/10; mated to an intact male, pregnant, 0/18; P<0.05). A hemorrhagic follicle, observed grossly after ovariectomy, was large (13 mm) and fluctuant, with a thin translucent wall and dark red contents. No ovulatory stigma was detected, and after incising the wall, bloody fluid escaped and the follicle collapsed leaving only a small blood clot within the antrum. Ultrasonically, the formation of a hemorrhagic follicle was indicated by scattered free floating echogenic spots within the follicular antrum which swirled upon ballottement of the ovary. The antral contents appeared to become organized (did not swirl when ballotted) after follicle growth ceased. Ultrasonic indications of antral hemorrhage were not observed in any follicles in which ovulation was later detected (0/45 ovulatory follicles). All of the hemorrhagic follicles (13/13) involved the dominant follicle of a wave during which no copulatory stimulus was applied. Hemorrhagic follicles were apparently anovulatory and were repeatable (P<0.05) within individuals. The interval from first detection to the first day of maximum diameter was longer (P<0.05) and maximum diameter was greater (P<0.0001) for hemorrhagic follicles than nonhemorrhagic follicles (16.4 versus 13.1 d and 22.1 versus 12.8 mm, respectively); however, the interwave interval was not affected by the presence of a hemorrhagic follicle. Luteinization of the hemorrhagic follicle was indicated (thickened wall) in two llamas by an elevated plasma progesterone concentration and/or by ultrasound. By their large size, hemorrhagic follicles may be interpreted as hemorrhagic follicular cysts; however, they were not associated with other ovarian irregularities or with infertility.

Bravo, P.W.; Sumar, J. **Evaluation of intra abdominal vasectomy in llamas and alpacas.** *Journal of the American Veterinary Medical Association.* Nov 1, 1991; 199(9): 1164-1166. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: llamas, alpacas, vasectomy, abdomen, ductus deferens, laparoscopy, sterilization, deferentectomy.

Bravo, P.W.; Stabenfeldt, G.H.; Fowler, M.E.; Lasley, B.L. **Urinary steroids in the periparturient and postpartum periods through early pregnancy in llamas.** *Theriogenology.* Aug 1991; 36(2): 267-278. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, estrone, pregnanes, urine, pregnancy, parturition, postpartum period, estrone sulfate, pregnanediol glucuronide, progestins.

Abstract: Urinary steroids were determined daily in the periparturient and postpartum periods, including early pregnancy, in the female llama. Estrone sulfate (E1S) and pregnanediol glucuronide (PdG) concentrations were determined by enzyme immunoassay with values corrected for variations in urine concentration by creatinine. Estrone sulfate concentrations, elevated during the last 20 days of gestation through 12 hours before parturition, were declining at the time of delivery. Pregnanediol glucuronide concentrations followed a pattern similar to that of estrone sulfate except that values began to decrease 5 days before parturition. Values for both E1S and PdG were basal by 24 hours after delivery. The first significant elevation of estrone sulfate, indicative of initial follicle development, was observed 5 days after parturition. Pregnanediol glucuronide concentrations were low during the postpartum period until 4 to 5 days after breeding. The PdG values rose steadily following copulatory induced ovulation, which was initiated at about 2 weeks postpartum; values continued to increase through the first 15 days of pregnancy.

Burt, Sandi. *Llamas: an Introduction to Care, Training, and Handling.* Alpine Publications, Loveland, CO. c1991. xiii, 190 p., ill. ISBN: 0931866499.

NAL call no.: SF469.L52B87

Descriptors: llamas as pets, training, care, handling, diseases, feeding.

Claverias H., Ricardo; Centro de Estudios para el Desarrollo de las Comunidades Alpaqueras del Peru. Centre Canadien d'Etudes de Cooperation Internationale. *Development of the Alpaca Raising Industry.* CEDCAP: CECI, Lima. 1991. 268 p., ill.

NAL call no.: SF401.A4P76 1991

Descriptors: alpacas, Andes region, congresses, economic aspects, livestock production.

Deters, P.R.; Deters, J. **Fescue: What's lurking in our pastures.** *Llama Banner.* Aug/Sept 1991; 4(1): 29-30. ISSN: 0899-6262.

NAL call no.: SF401.L6L5

Descriptors: *Festuca*, endophytes, horses, cattle, llamas, *Acremonium coenophialum*.

Fitzgerald, S.D.; Harrington, D.D. **Pulmonary nocardiosis in a young llama.** *Equine Practice.* Mar 1991; 13(3): 26-29. ISSN: 0162-8941.

NAL call no.: SF951.E62

Descriptors: llamas, nocardia, pleuropneumonia, histopathology, case reports.

Foreyt, W.J.; Richard, L.G.; Dowling, S.; Parksh, S.; Pipas, M. **Experimental infections of two llamas with the Meningeal worm (*Parelaphostrongylus tenuis*).** *Journal of Zoo and Wildlife Medicine.* 1991; 22(3): 339-344. ISSN: 0090-3558.

NAL call no.: 41.9 W64B

Descriptors: llamas, parasitic worms, experimental infections, effects of infection, *Parelaphostrongylus tenuis*.

Franklin, W.L.; Fritz, M.A. **Sustained harvesting of the Patagonia guanaco: Is it possible or too late?** In: Kent Redford; John Robinson (Editors). *Neotropical Wildlife Use and Conservation.* University of Chicago Press, Chicago, Illinois. 1991. p. 573-629. ISBN: 0226722589. ISBN: 0226722597 (pbk.).

NAL call no.: SK159.N46

Descriptors: guanacos, wild animal resources, populations levels, sustained harvesting potential, low levels of population, Patagonia, Chile.

Fundacion para el Desarrollo del Agro (Peru). Seminario-Taller La Alpaca, Ventaja Comparativa Peruana, Retos y Oportunidades (1991: Arequipa, Peru). **Alpaca, Peruvian Comparative Advantage, Challenges and Opportunities**. Fundacion para el Desarrollo del Agro, Lima, Peru. [1991?] 270 p., ill.

NAL call no.: HD9904.P42A47 1991

Descriptors: wool industry, conference, alpaca, economic aspects, Peru.

Gionfriddo, J.R.; Rosenbusch, R.; Kinyon, J.M.; Betts, D.M.; Smith, T.M. **Bacterial and mycoplasmal flora of the healthy camelid conjunctival sac**. *American Journal of Veterinary Research*. July 1991; 52(7): 1061-1064. ISSN: 0002-9645.

NAL call no.: 41.8 AM3A

Descriptors: llamas, *Lama guanicoe*, alpacas, conjunctiva, microbial flora, bacteria, *Mycoplasma*, Iowa, Missouri. **Abstract:** Healthy conjunctival sacs of 88 animals of 3 species of captive camelids (*Lama glama*, *Lama guanicoe*, *Lama pacos*) and llama guanaco hybrids were sampled for bacterial and mycoplasmal flora. Mycoplasmas were not isolated from any animal. Eleven genera of bacteria were isolated. The most frequent isolates were *Staphylococcus epidermidis* and *Pseudomonas* spp. Nine varieties of *Pseudomonas* were found, which represented at least 3 *Pseudomonas* species. Many of the bacterial isolates (especially the pseudomonads) are potential pathogens in the eyes of these camelids.

Hart, Rosana. **Living with Llamas: Tales from Juniper Ridge**. 3rd ed. Juniper Ridge Press, Ashland, Or. 1991. 188 p., ill. ISBN: 0916289133.

NAL call no.: SF401.L6H36 1991

Descriptors: llamas, anecdotes, breeders, biography, Oregon.

Abstract: A personal narrative about life as an owner and breeder of llamas.

Hart, Rosana. **Llamas for Love and Money**. 1st ed. Juniper Ridge Press, Ashland, Or. 1991. 270 p., ill. ISBN: 0916289036.

NAL call no.: SF401.L6H37 1991

Descriptors: llamas, care, breeding, anecdotal information.

Hopkins, S.M.; Althouse, G.C.; Jackson, L.L.; Evans, L.E. **Surgical treatment of uterine torsion in a llama (*Lama glama*)**. *Cornell Veterinarian*. Oct 1991; 81(4): 425-428. ISSN: 0010-8901.

NAL call no.: 41.8 C81

Descriptors: llamas, uterine torsion, caesarean section, case reports.

Hung, A.L.; Alvarado, A.; Lopez, T.; Perales, R.; Li, O.; Garcia, E. **Detection of antibodies to mycoplasmas in South American camelids**. *Research in Veterinary Science* (London). Nov 1991; 51(3): 250-253. ISSN: 0034-5288.

NAL call no.: 41.8 R312

Descriptors: alpacas, llamas, vicunas, *Mycoplasma mycoides*, serological surveys, antibodies, incidence, goats, sheep, Peru.

Abstract: Indirect haemagglutination tests on sera from 757 South American camelids (alpacas, llamas and vicunas) carried out in the Andean region of Peru, revealed evidence of exposure mainly to *Mycoplasma mycoides* subspecies *mycoides* LC. The incidence of detectable antibodies to this mycoplasma in 554 alpacas was 5.0 per cent and in 141 llamas 15.6 per cent. Antibody to *Mycoplasma capricolum* and the F38 biotype was detected in 0.9 per cent and 0.2 per cent of alpacas, respectively. In a group of 62 vicunas only one reactor to both *M m mycoides* LC and *M capricolum* was observed. No reactors to *M mycoides* subspecies *capri* or *Magalactiae* were observed in the flocks examined. Antibodies to mycoplasma were also detected in nine out of 10 goat flocks tested. The incidence of antibodies to *M m mycoides* LC was 13.8 per cent, 3.8 per cent for *M capricolum* and 1.8 per cent for the F38 biotype. In a group of 110 sheep, six reactors (5.5 per cent) to *M m mycoides* LC and one (0.9 per cent) to F38 were observed. The implications of these results are discussed in relation to the involvement of mycoplasmas in existing disease in camelids in Peru.

Iriarte, J.L.; Franklin, W.L.; Johnson, W.E. **Feeding ecology of the Patagonia puma in southern Chile**. *Revista Chilena de Historia Natural*. 1991; 64: 145-156. ISSN: 0716-078X.

Descriptors: camelids, guanacos, prey species, preference of prey species, *Puma concolor patagonica*, Chile.

Kuznar, L.A. **Herd composition in an Aymara community of the Peruvian Altiplano: a linear programming problem.** *Human Ecology*. Sept 1991; 19(3): 369-387. ISSN: 0300-7839.

NAL call no.: HM206.A1H8

Descriptors: alpacas, herds, linear programming, livestock numbers, species, farm management, decision analysis, value systems, constraints, social environment, traditional society, rural communities, animal products, farmyard manure, forage, labor, transport, marginal analysis, resource allocation, mathematical models, Chinchillape, Peru, utility theory, camelid herding, marginal costs.

Paul Murphy, J.R.; Morgan, J.P.; Snyder, J.R.; Fowler, M.E. **Radiographic findings in young llamas with forelimb valgus deformities: 28 cases (1980 1988).** *Journal of the American Veterinary Medical Association*. June 15, 1991; 198(12): 2107-2111. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, legs, deformities, radius, ulna, metacarpus, case reports.

Rickard, L.G.; Bishop, J.K. **Helminth parasites of llamas (*Lama glama*) in the Pacific Northwest.** *Proceedings of the Helminthological Society of Washington*. Jan 1991; 58(1): 110-115. ISSN: 0018-0130.

NAL call no.: 436.9 H36

Descriptors: llamas, helminths, Nematoda, postmortem examinations, Trematoda, surveys, Oregon.

Rickard, L.G.; Bishop, J.K. **Redescription of *Trichuris tenuis* Chandler, 1930, from llamas (*Lama glama*) in Oregon with a key to the species of *Trichuris* present in North American ruminants.** *Journal of Parasitology*. Feb 1991; 77(1): 70-75. ill. ISSN: 0022-3395.

NAL call no.: 448.8 J824

Descriptors: llamas, *Trichuris*, redescrptions, morphology, keys, ruminants, Oregon, North America.

Russell, B. **The scientific study of animal behavior.** *Llama Banner*. Manhattan, KS: Llama Banner. Aug/Sept 1991; 4(1): 97-102. ISSN: 0899-6262.

NAL call no.: SF401.L6L5

Descriptors: animal behavior, llamas, ethology.

Samitz, E.M.; Biberstein, E.L. ***Actinobacillus suis* like organisms and evidence of hemolytic strains of *Actinobacillus lignieresii* in horses.** *American Journal of Veterinary Research*. Aug 1991; 52(8): 1245-1251. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: horses, llamas, *Actinobacillus*, *Actinobacillus lignieresii*, characterization, strain differences, biotypes, hemolysis.

Abstract: Thirty seven local isolates of *Actinobacillus suis* like organisms from diseased and clinically normal horses and 1 llama were compared with reference strains of *A suis*, *A lignieresii*, *A equuli*, *A capsulatus*, *A hominis*, *A (Pasteurella) ureae*, and equine *A suis* like organisms (ASLO) previously described in literature. Comparison was by cultural characteristics, carbohydrate fermentation, enzyme profiles, and whole cell protein polyacrylamide gel electrophoresis. Carbohydrate fermentation, determined by API CH gallery, divided 36 equine ASLO isolates into 6 API CH biotypes. The llama isolate was an additional distinct biotype. The biochemical comparisons between *A suis* and ASLO did not reveal remarkable and consistent differences. Enzyme analysis revealed 5 API ZYM biotypes, one of which included the same strains as one of the API CH biotypes and consisted in both instances of 4 esculin negative ASLO cultures and the reference strain of *A lignieresii*. We conclude that the 4 strains were hemolytic variants of *A lignieresii*. Protein electrophoresis disclosed 15 banding patterns, 10 of which represented equine ASLO strains. The reference strains of *A suis* shared the pattern predominant among equine ASLO. Four of the remaining reference strains of *Actinobacillus* species each had a unique profile, whereas the type strain of *A capsulatus* and the llama isolate had similar profiles. The groupings of cultures resulting from the different testing methods had little relation to each other and to the anatomic source of the strains except the strains comprising API CH biotype III, which originated in the equine respiratory tract, and the *A lignieressi* cluster.

Smith, B.B.; Reed, P.J.; Pearson, E.G.; Long, P.; Lassen, E.D.; Watrous, B.J.; Lovelady, S.; Sims, D.E.; Snyder, S.P. ***Erythrocyte dyscrasia, anemia, and hypothyroidism in chronically underweight llamas.*** *Journal of the American*

Veterinary Medical Association. Jan 1, 1991; 198(1): 81-88. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, animal diseases, anemia, erythrocytes, blood disorders, hypothyroidism, underweight, symptoms, failure to thrive, case reports.

Smith, J.C.L.; Ferguson, J.G.; Fisher, M.A. **Congenital coloboma in a llama**. *Canadian Veterinary Journal*. July 1991; 32(7): 432-433. ISSN: 0008-5286.

NAL call no.: 41.8 R3224

Descriptors: llamas, coloboma, eye diseases, symptoms, histopathology, case reports.

Squire, K.R.E.; Adams, S.B. **Bilateral wedge ostectomy on an 18 month old llama with severe bilateral carpal valgus**. *Journal of the American Veterinary Medical Association*. Nov 1, 1991; 199(9): 1174-1176. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, growth disorders, legs, malformations, case reports, surgical operations.

Sumar, J.; Bravo, P.W. **In situ observation of the ovaries of llamas and alpacas by use of a laparoscopic technique**. *Journal of the American Veterinary Medical Association*. Nov 1, 1991; 199(9): 1159-1163. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, alpacas, ovaries, laparoscopy, reproduction.

United States. Forest Service. Pacific Northwest Region. **Packing with Llamas: Partners on the Trail**. R6-F16-SO, no. 0291. U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Region, [Washington, D.C.?]. [1991] 1 folded sheet (8 p.), ill.

NAL call no.: aGV199.75.P33 1991

Descriptors: llama pack camping, backpacking, animal welfare, Pacific Northwest.

Van Metre, D.C.; Barrington, G.M.; Parish, S.M.; Tumas, D.B. **Otitis media/interna and suppurative meningoencephalomyelitis associated with *Listeria monocytogenes* infection in a llama**. *Journal of the American Veterinary Medical Association*. July 15, 1991; 199(2): 236-240. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, *Listeria monocytogenes*, otitis, encephalitis, case reports, histopathology.

Weaver, A.D. **Inguinal hernial repair in a llama**. *Veterinary Record* (London). Apr 13, 1991; 128(15): 356-357. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, hernia, rupture, surgical operations, case reports, inguinal ring.

Williams, J.R.; Evermann, J.F.; Beede, R.F.; Scott, E.S.; Dilbeck, P.M.; Whetstone, C.A.; Stone, D.M. **Association of bovine herpesvirus type 1 in a llama with bronchopneumonia**. *Journal of Veterinary Diagnostic Investigation*. July 1991; 3(3): 258-260. ISSN: 1040-6387.

NAL call no.: SF774.J68

Descriptors: llamas, bovine herpesvirus, lungs, isolation, pneumonia, case reports.

1990

Adams, G.P.; Sumar, J.; Ginther, O.J. **Effects of lactational and reproductive status on ovarian follicular waves in llamas (*Lama glama*)**. *Journal of Reproduction and Fertility*. Nov 1990; 90(2): 535-545. ISSN: 0022-4251.

NAL call no.: 442.8 J8222

Descriptors: llamas, ovaries, follicles, corpus luteum, growth rate, regression, ovulation, pregnancy, lactation.

Alarcon, V.; Sumar, J.; Riera, G.S.; Foote, W.C. **Comparison of three methods of pregnancy diagnosis in alpacas and llamas**. *Theriogenology*. Dec 1990; 34(6): 1119-1127. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: alpacas, llamas, pregnancy diagnosis, rectal palpation, ultrasonic diagnosis, sexual behavior, estrus,

comparisons, accuracy.

American Association of Small Ruminant Practitioners. Western Regional Coordinating Committee 46. Oregon State University. College of Veterinary Medicine. *American Association of Small Ruminant Practitioners, Western Regional Coordinating Committee 46 (Ram Epididymitis and Ovine Footrot), Oregon State University, College of Veterinary Medicine present Symposium on Diseases of Small Ruminants, Nendels Inn, Corvallis, Oregon, June 7, 8, 9, 1990.* [s.l.: s.n., 1990] v, 149 p., ill.

NAL call no.: SF968.S96 1990

Descriptors: ruminants diseases, sheep, goats, llamas, alpacas, congresses, diseases.

Anonymous. **Rabies in llamas: Oklahoma.** *Dairy, Food and Environmental Sanitation.* Oct 1990; 10(10): 614. ISSN: 1043-3546.

NAL call no.: SF221.D342

Descriptors: llamas, rabies, incidence of disease, susceptibility, Oklahoma.

Belknap, E.B.; Dunstan, R.W. **Congenital ichthyosis in a llama.** *Journal of the American Veterinary Medical Association.* Sept 15, 1990; 197(6): 764-767. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, congenital abnormalities, hyperkeratosis, conjunctivitis, case studies, symptoms, diagnosis, treatment.

Belknap, E.B.; Schmidt, A.R.; Carleton, C.L. **Double cervixes in two llamas.** *Journal of the American Veterinary Medical Association.* Oct 15, 1990; 197(8): 1049-1050. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, cervix, congenital abnormalities, case studies, embryonic development, abnormal development.

Bravo, P.W.; Fowler, M.E.; Stabenfeldt, G.H.; Lasley, B. **Endocrine responses in the llama to copulation.** *Theriogenology.* Apr 1990; 33(4): 891-899. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, hormones, LH, estradiol, copulation, progesterone, gonadotropins, ovulation.

Bravo, P.W.; Fowler, M.E.; Stabenfeldt, G.H.; Lasley, B. **Ovarian follicular dynamics in the llama.** *Biology of Reproduction.* Oct 1990; 43(4): 579-585. ill. ISSN: 0006-3363.

NAL call no.: QL876.B5

Descriptors: llamas, Graafian follicles, estradiol, estrogens, plasma, urine, gonadotropins, hormone secretion, LH, FSH, progesterone.

Fowler, M.E.; Olander, H.J. **Fetal membranes and ancillary structures of llamas (*Lama glama*).** *American Journal of Veterinary Research.* Sept 1990; 51(9): 1495-1500. ill. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, fetal membranes, placenta, pregnancy, morphology.

Abstract: The placenta of llamas is epitheliochorial, with patchy areas of dense folded papillation serving as the placentome. The amnion of the full term placenta is closely adhered to either the allantois or the chorion and remains with these structures at the time of parturition. Llamas and alpacas, like dromedaries, have an extra fetal membrane that is derived from the epidermis of the fetus. In association with the watery amniotic fluid of llamas, the epidermal membrane is slippery, facilitating delivery of the fetus.

Franklin, W.L. **Wild camelids of South America: guanacos and vicuñas.** In: W. Klienburg (Editor). *Kindler-Grzimek's Animal Life Encyclopedia.* Germany. 1990.

Descriptors: guanacos, vicunas, wild populations, description of species, natural history, behavior, taxonomic relationships, range, distribution, South American camelids.

Garlick, D.S.; Doherty, T.J.; Paradis, M.R. **Gemistocytic astrocytoma in a one month old llama.** *Journal of the American Veterinary Medical Association.* June 15, 1990; 196(12): 2009-2010. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, young animals, neoplasms, neuroglia, case studies, histopathology, astrocytes.

Johnson, L.W.; Gentz, E.J. **Multiple nonlethal congenital anomalies in a llama.** *Journal of the American Veterinary Medical Association.* Feb 15, 1990; 196(4): 630-631. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, congenital abnormalities, lameness, hocks, case studies.

Johnson, W.E.; Franklin, W.L.; Iriarte, J.A. **The mammalian fauna of the northern Chilean Patagonia: a biogeographical dilemma.** *Mammalia.* 1990; 54: 457-469. ISSN: 0026-1461.

Descriptors: mammalian fauna, camelids, resource management, Patagonia, Chile.

Leon, J.B.; Smith, B.B.; Timm, K.I.; LeCren, G. **Endocrine changes during pregnancy, parturition and the early post partum period in the llama (*Lama glama*).** *Journal of Reproduction and Fertility.* Mar 1990; 88(2): 503-511. ISSN: 0022-4251.

NAL call no.: 442.8 J8222

Descriptors: llamas, endocrine glands, pregnancy, parturition, postpartum interval, progesterone, estrogens.

McCorkle, Constance M.; Small Ruminant Collaborative Research Support Program. **Improving Andean Sheep and Alpaca Production: Recommendations from a Decade of Research in Peru.** University of Missouri-Columbia, Columbia, Mo. 1990. xx, 220 p., ill.

NAL call no.: SF375.5.P4I56 1990

Descriptors: alpacas, sheep, production systems, care, management, breeding, research application, Andes, Peru.

McGee, Marty; Tellington-Jones, Linda; Hart, Kelly. *Basic T.E.A.M. with Llamas.* Olympia, WA: Juniper Ridge Press, c1990. 1 videocassette (112 min.): sd., col.

NAL call no.: Videocassette no. 1770

Descriptors: llamas training, training method, positive reinforcement.

Abstract: Presents the basics of the Tellington-Jones Equine Awareness Method (T.E.A.M.) as a way to train llamas.

McLaughlin, B.G.; Evans, C.N.; McLaughlin, P.S.; Johnson, L.W.; Smith, A.R.; Zachary, J.F. **An Eperythrozoon like parasite in llamas.** *Journal of the American Veterinary Medical Association.* Nov 1, 1990; 197(9): 1170-1175. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, eperythrozoon, erythrocytes, bacterial diseases, symptoms, diagnosis, treatment, United States.

NOVA. *In the Land of Llamas.* 1990. Identification Number: ASIN 6302420431 (Amazon.com). Note: William L. Franklin was an Associate Producer and Scientific Consultant.

Descriptors: llamas, domesticated camelids, role in the culture and economic lives of indigenous people, history, uses, South America.

Powers, B.E.; Johnson, L.R.; Linton, L.B.; Garry, F.; Smith, J. **Endometrial biopsy technique and uterine pathologic findings in llamas.** *Journal of the American Veterinary Medical Association.* Nov 1, 1990; 197(9): 1157-1162. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, biopsy, endometrium, female infertility, uterine diseases, histopathology, prognosis.

Reagan, W.J.; Garry, F.; Thrall, M.A.; Colgan, S.; Hutchison, J.; Weiser, M.G. **The clinicopathologic, light, and scanning electron microscopic features of eperythrozoonosis in four naturally infected llamas.** *Veterinary Pathology.* Nov 1990; 27(6): 426-431. ill. ISSN: 0300-9858.

NAL call no.: 41.8 P27

Descriptors: llamas, eperythrozoon, pathology, anemia, hypoproteinemia, blood picture, blood chemistry, new host records.

Rivero, J.L.; Cascone, O.; Biscoglio de Jimenez Bonino, M.J. **Conformational comparison in the growth hormone family.** *Comparative Biochemistry and Physiology. B. Comparative Biochemistry.* 1990; 95(2): 229-232. ISSN: 0305-

0491.

NAL call no.: QP501.C6

Descriptors: cattle, somatotropin, horses, man, monkeys, sheep, alpaca.

Tvedten, H.W. **What is your diagnosis.** *Veterinary Clinical Pathology*. Sept 15, 1990; 19 (3): 77-78. ISSN: 0275-6382.

NAL call no.: SF601.A54

Descriptors: llamas, blood picture, diagnosis, hemoglobin, crystals.

1989

Adams, G.P.; Griffin, P.G.; Ginther, O.J. **In situ morphologic dynamics of ovaries, uterus, and cervix in llamas.**

Biology of Reproduction. Sept 1989; 41(3): 551-558. ill. ISSN: 0006-3363.

NAL call no.: QL876.B5

Descriptors: llamas, ovaries animal, uterus, cervix, morphology, follicles, pregnancy, corpus luteum.

Bradford, G.E.; Burfening, P.J.; Cartwright, T.C. **Evaluation of production and reproduction of sheep, goat and alpaca genotypes in the small ruminant collaborative research support program.** *Journal of Animal Science*. Nov 1989; 67(11): 3058-3067. ISSN: 0021-8812.

NAL call no.: 49 J82

Descriptors: sheep, goats, alpaca, animal research, genetic resources, animal breeding, breeding programs, Kenya, Morocco, Indonesia, Peru, Brazil.

Descriptors: sheep, goats, alpaca, animal research, genetic resources, animal breeding, breeding programs, Kenya, Morocco, Indonesia, Peru, Brazil.

Bryant, F.C.; Florez, A.; Pfister, J. **Sheep and alpaca productivity on high Andean rangelands in Peru.** *Journal of Animal Science*. Nov 1989; 67(11): 3087-3095. ISSN: 0021-8812.

NAL call no.: 49 J82

Descriptors: sheep, alpaca, animal production, animal husbandry, stocking rate, productivity, Peru.

Cheney, J.M.; Allen, G.T. **Parasitism in llamas.** *Veterinary Clinics of North America. Food Animal Practice*. Mar 1989; 5(1): 217-225. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, nematodes, Protozoa, arthropod pests, internal and external parasites.

Cheney, S. **Llamas and South American Camelids January 1970 October 1988.** *Quick Bibliography Series, U.S. Department of Agriculture, National Agricultural Library*. The Library. Beltsville, MD. Feb 1989; no. 89-29, 14 p.

NAL call no.: aZ5071.N3

Descriptors: llamas, Camelidae, animal physiology.

Ebel, S. **The Llama industry in the United States.** *Veterinary Clinics of North America. Food Animal Practice*. Mar 1989; 5(1): 1-20. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, domestication, history, adaptability, animal production, facilities, equipment, veterinary services, United States.

Fowler, Murray E. *Medicine and Surgery of South American Camelids: Llama, Alpaca, Vicuna, Guanaco*. 1st ed. Iowa State University Press, Ames. 1989. vii, 391 p., ill. ISBN: 0813803934.

NAL call no.: SF997.5.L35F68 1989

Descriptors: llamas, diseases, vicunas, surgery, drug treatment.

Fowler, M.E.; Zinkl, J.G. **Reference ranges for hematologic and serum biochemical values in llamas (*Lama glama*).** *American Journal of Veterinary Research*. Dec 1989; 50(12): 2049-2053. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, hematology, blood serum, blood chemistry, age differences, sex differences, California, Nevada.
Abstract: Hematologic and serum biochemical values were determined in 174 llamas of all age groups and both sexes from ranches in California and Nevada. Compared with hematologic values for horses and cattle, llama erythrocytes

were more numerous (10.1 to 17.3 x 10⁶/microliter), but the PCV was lower (25 to 45%) because the smaller elliptical cells pack tighter. The mean corpuscular volume was half that of horses and cattle (22 to 29.5 fl). The mean corpuscular hemoglobin concentration was higher (38.9 to 46.2 g/dl), and the mean corpuscular hemoglobin slightly lower (9.6 to 12.6 pg). Most serum biochemical values were similar to those of cattle and horses, with the exception of triiodothyronine (48 to 468 ng/dl) and thyroxin (9.8 to 30 microgram/dl), which are up to 10 times higher than values for other domestic species.

Fowler, M. **Physical examination, restraint and handling.** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5(1): 27-35. ill. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, handling, restraint, body condition, hematology, blood serum, blood chemistry, diagnostic techniques.

Garry, F. **Clinical pathology of llamas.** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5(1): 55-70. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, animal diseases, diagnostic techniques, hematology, blood serum, biochemistry, urine analysis, cerebrospinal fluid, abdominocentesis.

Guerrero Figueroa, Luis B.; Blanco Aguilar, Marcial. **Encuentro Alpaquero (2nd: 1989: Cajamarca, Peru).** *Alpaca in Northern Peru.* 1. ed. EDAC CIED: CONCYTEC, Cajamarca, Peru: 1989. 318 p.

NAL call no.: SF401.A4E5 1990

Descriptors: alpaca, Peru, congresses.

Heath, R.B. **Llama anesthetic programs.** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5(1): 71-80. ill. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, anesthesia, management, anesthetics.

Hoffman, Clare; Asmus, Ingrid. **Caring for Llamas: a Health and Management Guide.** Rocky Mountain Llama Association, Livermore, CO. c1989. 150 p., ill. ISBN: 0962276804.

NAL call no.: SF401.L6H54

Descriptors: llamas, care, management, disease recognition.

Johnson, LaRue W. **Llama medicine.** *The Veterinary Clinics of North America. Food Animal Practice.* 5(1). c1989. xii, 236 p., ill. ISSN: 0749 0720.

NAL call no.: SF601.V535 v.5, no.1

Descriptors: llamas diseases, treatment, surgical techniques, handling, restraint.

Johnson, L.W. **Llama reproduction.** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5(1): 159-182. ill. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, reproduction, female genitalia, animal breeding, pregnancy diagnosis, female infertility, endometritis, semen characters.

Johnson, LaRue W.; Hartworks Video (Firm). Llama Association of North America. Conference (1988: Redmond, Or.). **Llama Reproduction: a Neonatal Clinic.** Olympia, WA: Juniper Ridge Press, c1989. 2 videocassettes (3 hr., 34 min.): sd., col. 1 booklet (70 p., ill., 28 cm.).

NAL call no.: Videocassette no. 2356

Descriptors: llamas reproduction, care of neonates, breeding, fetal development, cria delivery.

Abstract: Through lecture, slides, and live footage, Dr. Johnson presents his clinic covering llama reproductive anatomy, breeding, fetal development, birth, and newborn care. He also covers the delivery of crias in a variety of positions, using plastic uteruses and stillborn cria.

Johnson, L.W. **Nutrition.** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5(1): 37-54. ill.

ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, animal nutrition, diets, nutrients, mineral supplements, digestion, nutrition physiology.

Kaneps, A.J.; Schmotzer, W.B.; Huber, M.J.; Riebold, T.W.; Watrous, B.J.; Arnold, J.S. **Fracture repair with transfixation pins and fiberglass cast in llamas and small ruminants.** *Journal of the American Veterinary Medical Association.* Nov 1, 1989; 195(9): 1257-1261. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: sheep, calves, llamas, bone fractures, fixation, pins, fiberglass casts.

Kingdon, L.B. **Llama leader for a day.** *Arizona Land & People.* Spring 1989; 39 (1): 12-14. ill. ISSN: 0033-0744.

NAL call no.: 6 P9452

Descriptors: llamas, backpacking, hiking, trails, arid zones, enterprises, Arizona.

Long, P. **Llama herd health.** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5(1): 227-232. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, herd improvement, animal health, vaccination, ectoparasites, parasitic worms.

Lunn, D.P.; Hinchcliff, K.W. **Cerebrospinal fluid eosinophilia and ataxia in five llamas.** *Veterinary Record* (London). Mar 25, 1989; 124(12): 302-305. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, ataxia, eosinophilia, cerebrospinal fluid, symptoms, physiopathology, *Parelaphostrongylus tenuis*, case studies, drug therapy.

McLaughlin, B.G.; Evans, N.C. **Urethral obstruction in a male llama.** *Journal of the American Veterinary Medical Association.* Dec 1, 1989; 195(11): 1601-1602. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, urethra, blockage, symptoms, postmortem examinations, case studies.

Mulrooney, D.M.; Johnson, M.R.; Smith, B.B.; Zimmerman, G.L. **Clinical reference values for serum protein electrophoresis for the llama (*Lama glama*).** *American Journal of Veterinary Research.* Nov 1989; 50(11): 1889-1892. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, young animals, female animals, pregnancy, male animals, blood serum protein, electrophoresis, Oregon.

Abstract: Serum protein electrophoresis was performed on 71 clinically healthy juvenile and adult llamas (6 juvenile males, 7 juvenile females 25 adult males, 13 adult females, and 20 pregnant females) to determine normal serum protein concentrations. Values were reported for each of the 5 groups because the groups were not homogeneous in all 8 peaks. Although the values reported here may serve as reference values for adults, they represent only a guideline for the juveniles because of the limited number of animals in each of these groups.

Oxley, J.W. **Domestic and host country institution strengthening through the small ruminant collaborative research support program experience and projections toward the next decade.** *Journal of Animal Science.* Nov 1989; 67(11): 3118-3123. ISSN: 0021-8812.

NAL call no.: 49 J82

Descriptors: sheep, goats, alpaca, research, international cooperation, development aid, United States, developing countries.

Paul Murphy, J.; Gershwin, L.J.; Thatcher, E.F.; Fowler, M.E.; Habig, W.H. **Immune response of the llama (*Lama glama*) to tetanus toxoid vaccination.** *American Journal of Veterinary Research.* Aug 1989; 50(8): 1279-1281. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: *Lama*, llamas, immune response, vaccination, *Clostridium tetani*, tetanus, enzyme linked immunosorbent assay, California.

Abstract: An ELISA was developed to measure serum concentrations of tetanus toxoid specific immunoglobulins. The titers obtained with this assay were compatible with those obtained by the standard mouse toxin neutralization test. Serum samples from 123 llamas were analyzed for ELISA titers to tetanus toxoid. Of the 82 vaccination adults, 75 (91%) had titers greater than or equal to 1:50. The vaccination status and titers of weanlings and juveniles (3 to 12 months old) varied; of the 21 vaccinated, 17 (81%) had titers greater than or equal to 1:50 and 7 of 9 (78%) unvaccinated llamas had titers less than 1.50. The ELISA titers of unvaccinated llamas less than 8 weeks old (crias) were matched with the maternal titers. All crias with titers less than 1:50 had dams with titers greater than or equal to 1:50.

Paul Murphy, J. **Obstetrics, neonatal care, and congenital conditions.** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5(1): 183-202. ill. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, obstetrics, newborn animals, congenital abnormalities, diagnosis, treatment.

Paulsen, M.E.; Young, S.; Smith, J.A.; Severin, G.A. **Bilateral chorioretinitis, centripetal optic neuritis, and encephalitis in a llama.** *Journal of the American Veterinary Medical Association.* May 1, 1989; 194(9): 1305-1308. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, blindness animal, neuritis, encephalitis, retinitis, histopathology, diagnosis, etiology, infectious diseases, case studies.

Pfister, J.A.; San Martin, F.; Rosales, L.; Sisson, D.V.; Flores, E.; Bryant, F.C. **Grazing behaviour of llamas, alpacas and sheep in the Andes of Peru.** *Applied Animal Behaviour Science.* June 1989; 23(3): 237-246. ISSN: 0168-1591.

NAL call no.: QL750.A6

Descriptors: llamas, alpaca, sheep, grazing behavior, mountain areas, grazing time, feeding habits, Peru.

Proyecto Alpacas, Proyecto Andino de Tecnologias Campesinas (Peru). **Breeding of llamas and alpacas in the Andes.** *Proyecto Alpacas, Convenio COTESU-INIAA: Proyecto Andino de Tecnologia Campesina, [Peru] . c1989.* 169 p., [6] p. of plates: ill. (some col.).

NAL call no.: SF401.L6C75 1989

Descriptors: llamas, Andes mountain region, breeding, alpaca, Peru.

Riebold, T.W.; Kaneps, A.J.; Schmotzer, W.B. **Anesthesia in the llama.** *Veterinary Surgery.* Sept/Oct 1989; 18 (5): 400-404. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: llamas, anesthesia, anesthetics.

Rosychuk, R.A.W. **Llama dermatology.** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5(1): 203-215. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, skin diseases, allergies, neoplasms, bacteria, mites.

San Martin, F.; Bryant, F.C. **Nutrition of domesticated South American llamas and alpacas.** *Small Ruminant Research.* Sept 1989; 2(3): 191-216. ISSN: 0921-4488.

NAL call no.: SF380.I52

Descriptors: llamas, alpacas, animal anatomy, stomach, digestion, feed intake, feeding preferences, sheep, stocking rate, Andes, South America.

Simmons, A.G. **Alternative site for the single intradermal comparative tuberculin test in the llama (*Lama glama*).** *Veterinary Record (London).* Jan 7, 1989; 124(1): 17-18. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, tuberculin, diagnostic techniques, skin tests, tuberculosis, *Mycobacterium bovis*.

Smith, B.B.; Pearson, E.G.; Leon, J. **Evaluation of normal triiodothyronine and tetraiodothyronine concentrations in llamas (*Lama glama*).** *American Journal of Veterinary Research.* Aug 1989; 50(8): 1215-1219. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: *Lama*, llamas, blood sampling, blood serum, thyronine, triiodothyronine, thyroid diseases, diagnosis, thyroid gland.

Abstract: Basal serum triiodothyronine (T3) and tetraiodothyronine (T4) concentrations have not been established for the llama (*Lama glama*). In addition, changes in T3 and T4 concentrations in response to thyroid stimulating hormone (TSH) administration have not been determined, making clinical evaluation of problems referable to thyroid dysfunction difficult. In study 1, basal T3 and T4 concentrations were determined in serum samples collected from 132 clinically healthy llamas. The llamas were allotted to 3 groups: mature intact or neutered males (group I, n = 25), nonpregnant sexually mature females (group II, n = 21), and pregnant females (group III, n = 86). A mean concentration and a 95% confidence interval were computed for each group. An analysis of variance (ANOVA) indicated that a single confidence interval range (0.45 to 4.18, mean = 1.37 ng T3/ml) adequately defined the normal T3 concentrations for all groups. An ANOVA indicated that the T4 concentrations for the female populations (groups II and III) could be combined with a normal confidence interval range of 39 to 204 ng/ml (mean = 88 ng/ml), whereas a separate range (70 to 220 ng/ml, mean = 124 ng/ml) was determined for the male population. An ANOVA indicated that a single confidence interval range (0.0066 to 0.0321, mean = 0.0146) adequately defined the normal T3/T4 ratio for all groups. In study 2, T3 and T4 concentrations were evaluated in 10 healthy llamas immediately preceding and at 2, 4, 6, 8, and 24 hours after the IV administration of 3 IU of TSH/44 kg of body weight. The T3 and T4 concentrations were significantly higher by 2 hours after TSH administration in both groups. Peak T3 and T4 concentrations were observed at 4 and 8 hours, respectively, after TSH administration. When normalized with respect to serum T3 concentrations in samples collected immediately prior to TSH administration, the maximal increase in predicted T3 concentration was 4.06 fold (80% confidence interval range = 2.99 to 5.50 fold) at 4 hours after TSH administration. The maximal increase in predicted normalized T4 concentration was 2.32 fold (80% confidence interval range = 1.76 to 3.05 fold) at 8 hours after TSH administration. The TSH stimulated increases in T3 and T4 concentrations at 4 hours were clearly distinguishable from values in samples obtained before TSH administration.

Smith, J.A. **Noninfectious diseases, metabolic diseases, toxicities, and neoplastic diseases of South American camelids.** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5(1): 101-143. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, metabolic diseases, poisoning, toxicity, neoplasms, poisonous plants, South America.

Sponenberg, D.P.; Ito, S. **Comparative pigmentation of sheep, goats, and llamas what colors are possible through selection.** In: *Colored Sheep and Wool: Exploring their Beauty and Function: the Proceedings of the World Congress on Coloured Sheep, U.S.A.* Edited by Kent Erskine. Black Sheep Press, Ashland, Or. c1989. p. 154-155. ill. ISBN: 0960873627.

NAL call no.: SF371.2.W67 1989

Descriptors: sheep, goats, llamas, color, selection, pigmentation.

St. Jean, G.; Bramlage, L.R.; Constable, P.D. **Repair of fracture of the proximal portion of the radius and ulna in a llama.** *Journal of the American Veterinary Medical Association.* May 1, 1989; 194(9): 1309-1311. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, bone fractures, radius, ulna, surgical operations, repairing, case studies.

Thedford, T.R.; Johnson, L.W. **Infectious diseases of new world camelids (NWC).** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5(1): 145-157. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: Camelidae, llamas, alpaca, camels, infectious diseases, bacteria, viruses, fungi.

Turner, A.S. **Surgical conditions in the llama.** *Veterinary Clinics of North America. Food Animal Practice.* Mar 1989; 5 (1): 81-99. ill. ISSN: 0749-0720.

NAL call no.: SF601.V535

Descriptors: llamas, surgery, orthopedics, abdomen, head, urogenital system, bone fractures.

Warmington, B.G.; Wilson, G.F.; Barry, T.N. **Voluntary intake and digestion of ryegrass straw by llama X guanaco**

crossbreds and sheep. *Journal of Agricultural Science.* Aug 1989; 113(pt. 1): 87-91. ISSN: 0021-8596.

NAL call no.: 10 J822

Descriptors: guanacos, llamas, males, crossbreds, rams, kent or romney marsh, breeds of sheep, digestibility trials, feed intake, ryegrass straw, feces composition, liveweight gains, voluntary intake, New Zealand.

Wolcott, J. **High country camel.** *American Forestry.* Jan/Feb 1989; 95(1/2): 46-49. ill. ISSN: 0002-8541.

NAL call no.: 99.8 F762

Descriptors: forest recreation, forest trails, hiking, backpacking, llamas.

1988

Anonymous. **Are you considering a petting zoo? Don't overlook llamas.** *Rural Enterprise.* Summer 1988; 2(3): 22-23. ill.

NAL call no.: HD2346.U5R8

Descriptors: *Lama pacos*, zoological gardens, non-farm income, ancillary enterprises, diversification, Wisconsin.

Bustinza, A.V.; Burfening, P.J.; Blackwell, R.L. **Factors affecting survival in young alpacas (*Lama pacos*).** *Journal of Animal Science.* May 1988; 66(5): 1139-1143. ISSN: 0021-8812.

NAL call no.: 49 J82

Descriptors: alpaca, survival, genetic correlation, phenotypic correlation, heritability, birth weight, environmental factors.

Conboy, G.A.; O'Brien, T.D.; Stevens, D.L. **A natural infection of *Fascioloides magna* in a llama (*Lama glama*).** *Journal of Parasitology.* Apr 1988; 74: 345-346. ill. ISSN: 0022-3395.

NAL call no.: 448.8 J824

Descriptors: llamas, *Fascioloides magna*, infectivity, parasitic infections.

Esteban, L.R.; Thompson, J.R. **The digestive system of New World Camelids common digestive diseases of llamas.** *Iowa State University Veterinarian.* 1988; 50(2): 117-121. ISSN: 0099-5266.

NAL call no.: 41.8 V6425

Descriptors: llamas, digestive disorders, animal anatomy, physiology.

Gavier, D.; Kittleson, M.D.; Fowler, M.E.; Johnson, L.E.; Hall, G.; Nearenberg, D. **Evaluation of a combination of xylazine, ketamine, and halothane for anesthesia in llamas.** *American Journal of Veterinary Research.* Dec 1988; 49(12): 2047-2055. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, ketamine, halothane, xylazine, anesthesia, drug combinations, cardiovascular system, respiratory system, ventilation.

Abstract: Anesthesia induced by use of a combination of xylazine, ketamine, and halothane, under conditions of spontaneous and mechanically controlled ventilation, was evaluated in 5 llamas positioned in dorsal recumbency. Using chronically implanted catheters, systemic arterial blood pressure, pulmonary arterial pressure, right atrial pressure, heart rate and rhythm, cardiac output, blood pH and gas tensions, body temperature, and respiratory rate were measured before anesthesia induction (baseline), throughout the anesthetic period, and for 1 hour into the recovery period. During anesthesia, llamas undergoing spontaneous ventilation developed hypercapnia and respiratory acidosis. Cardiovascular function was decreased during both types of ventilation. The combination of xylazine, ketamine, and halothane in various doses and 2 ventilation procedures (spontaneous and controlled) provided a reliable method for general anesthesia in llamas, but marked cardiovascular depression developed during anesthesia maintenance with halothane. Spontaneous ventilation resulted in potentially clinically important respiratory acidosis.

Hawkey, C.M.; Gulland, F.M.D. **Haematology of clinically normal and abnormal captive llamas and guanaco.** *Veterinary Record* (London). Mar 5, 1988; 122(10): 232-234. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: llamas, guanacos, hematology, animal diseases, blood picture, hemoglobin value, hematocrit.

Llama Banner. Llama Banner, Manhattan, KS. 1988. v.: ill. (some col.). ISSN: 0899-6202.

NAL call no.: SF401.L6L5

Descriptors: llamas, periodicals, articles about llama care, producers, United States.

Ortega, I.M.; Franklin, W.L. **Feeding habitat utilization and preference by guanaco male groups in the Chilean Patagonia.** *Revista Chilena de Historia Natural.* 1988; 61: 209-216. ISSN: 0716-078X.

Descriptors: guanacos, male groups, habitat usage, feeding preferences, Patagonia, Chile.

Rebhun, W.C.; Jenkins, D.H.; Riis, R.C.; Dill, S.G.; Dubovi, E.J.; Torres, A. **An epizootic of blindness and encephalitis associated with a herpesvirus indistinguishable from equine herpesvirus I in a herd of alpacas and llamas.** *Journal of the American Veterinary Medical Association.* Apr 1, 1988; 192(7): 953-956. ill. ISSN: 0003-1488.

NAL call no.: 41.8 AM3

Descriptors: llamas, alpaca, Herpetoviridae, encephalitis, blindness animal, histopathology.

Rickard, L.G.; Bishop, J.K. **Prevalence of *Eimeria* spp. (Apicomplexa: Eimeriidae) in Oregon llamas.** *Journal of Protozoology.* Aug 1988; 35(3): 335-336. ISSN: 0022-3921.

NAL call no.: 439.8 J82

Descriptors: llamas, *Eimeria*, feces, mixed infection, diagnosis, Oregon.

Sumar, J. **Present and potential role of south American camelids in the high Andes.** *Outlook on Agriculture.* 1988; 17(1): 23-29. ill., maps. ISSN: 0030-7270.

NAL call no.: 10 OU8

Descriptors: Camelidae, alpaca, llamas, vicunas, guanacos, history, production potential, types, geographical distribution, physiology, reproductive behavior, taxonomy, mountain areas, South America.

Timm, K.I.; Watrous, B.J. **Urethral recess in two male llamas.** *Journal of the American Veterinary Medical Association.* Apr 1, 1988; 192(7): 937-938. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, urethra, male animals, radiography, catheters, male genitalia.

1987

Bishop, J.K.; Rickard, L.G. **Fecal survey of llamas (*Lama glama*) in Oregon: incidental recovery of *Nematodirus battus*.** *Journal of the American Veterinary Medical Association.* Dec 15, 1987; 191(12): 1579-1581. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, *Nematodirus battus*, disease surveys, feces composition, incidence, ova, Nematoda, Oregon.

Cartwright, M.E.; McChesney, A.E.; Jones, R.L. **Vaccination related anthrax in three llamas.** *Journal of the American Veterinary Medical Association.* Sept 15, 1987; 191(6): 715-716. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, anthrax, vaccines, vaccination, *Bacillus anthracis*.

Dargatz, D.A.; Johnson, L.W. **Castrating the llama: a step by step guide.** *Veterinary Medicine.* June 1987; 82(6): 625-627. ill. ISSN: 0042-4889.

NAL call no.: 41.8 M69

Descriptors: llamas, castration methods.

Delhon, G.A.; von Lawzewitsch, I. **Reproduction in the male llama (*Lama glama*), a South American camelid. I. Spermatogenesis and organization of the intertubular space of the mature testis.** *Acta Anatomica.* May 1987; 129(1): 59-66. ill. ISSN: 0001-5180.

NAL call no.: 444.8 AC82

Descriptors: llamas, male animals, reproductive ability, spermatogenesis, testes, Leydig cells, interstitial environment, Argentina.

Franklin, W.L. **My two decades with America's camels.** *International Wildlife*. 1987; 17(5): 34-43 + cover.

Descriptors: South American camelids, guanacos, vicunas, alpacas, llamas, biology, behaviors, care, wild populations.

Garmendia, A.E.; Palmer, G.W.; DeMartini, J.C.; McGuire, T.C. **Failure of passive immunoglobulin transfer: a major determinant of mortality in newborn alpacas (*Lama pacos*).** *American Journal of Veterinary Research*. Oct 1987; 48(10): 1472-1476. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: alpaca, newborn animals, mortality, immunoglobulins, colostral immunity.

Garmendia, A.E.; McGuire, T.C. **Mechanism and isotypes involved in passive immunoglobulin transfer to the newborn alpaca (*Lama pacos*).** *American Journal of Veterinary Research*. Oct 1987; 48(10): 1465-1471. ill. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: alpaca, newborn animals, immunoglobulins, colostral immunity.

Hart, Rosana. **Living with Llamas: Adventures, Photos, and a Practical Guide.** 2nd ed. (Part II revised). Juniper Ridge Press, Ashland, Or. c1987. 189 p., ill. ISBN: 091628901X.

NAL call no.: SF459.L52H37 1987

Descriptors: llamas as pets, animal welfare, anecdotal information, care and management.

Hochachka, P.W.; Mommsen, T.P.; Jones, J.H.; Taylor, C.R. **Substrate and O₂ fluxes during rest and exercise in a high altitude adapted animal, the llama.** *American Journal of Physiology*. Aug 1987; 253(2, pt. 2): R298-R305. ISSN: 0002-9513.

NAL call no.: 447.8 AM3

Descriptors: llamas, oxygen consumption, exercise, altitude, adaptation.

Kiorpes, A.L.; Kirkpatrick, C.E.; Bowman, D.D. **Isolation of *Giardia* from a llama and from sheep.** *Canadian Journal of Veterinary Research [Revue Canadienne de Recherche Vétérinaire]*. Apr 1987; 51(2): 277-280. ill. ISSN: 0830-9000.

NAL call no.: SF601.C24

Descriptors: sheep, llamas, Mongolian gerbil, *Giardia*, isolation, intestinal parasites, Wisconsin.

Krogdahl, D.W.; Thilsted, J.P.; Olsen, S.K. **Ataxia and hypermetria caused by *Parelaphostrongylus tenuis* infection in llamas.** *Journal of the American Veterinary Medical Association*. Jan 15, 1987; 190(2): 191-193. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, *Parelaphostrongylus tenuis*, ataxia, movement disorders, drug therapy, avermectins, ivermectin, Virginia, New Mexico.

Levine, S.A.; Lindsay, W.A.; Beck, K.A. **The use of a silicone T tube to treat tracheal stenosis in a llama.** *Veterinary Surgery*. May/June 1987; 16(3): 241-244. ill. ISSN: 0161-3499.

NAL call no.: SF911.V43

Descriptors: llamas, trachea, atresia, surgical operations, strictures, tracheostomy.

Reiner, R.J.; Bryant, F.C.; Farfan, R.D.; Craddock, B.F. **Forage intake of alpacas grazing Andean rangeland in Peru.** *Journal of Animal Science*. Mar 1987; 64(3): 868-871. ISSN: 0021-8812.

NAL call no.: 49 J82

Descriptors: alpaca, feed intake, grazing, rangelands, digestibility, dry season, wet season, Peru.

Rivera, H.; Madewell, B.R.; Meghino, E.A. **Serologic survey of viral antibodies in the Peruvian alpaca (*Lama pacos*).** *American Journal of Veterinary Research*. Feb 1987; 48(2): 189-191. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: alpaca, antibodies, viral diseases, disease surveys, blood serum, susceptibility, Peru.

Strain, M.G.; Strain, S.S. **Caring for the premature llama.** *Veterinary Medicine*. Dec 1987; 82(12): 1243-1244. ISSN:

0042-4889.

NAL call no.: 41.8 M69

Descriptors: llamas, premature infants, medical treatment, therapeutic diets, obstetrics.

1986

Bernhardson, W. **Campesinos and conservation in the Central Andes: indigenous herding and conservation of the vicuna.** *Environmental Conservation*. Winter 1986; 13(4): 311-318. ill., maps. ISSN: 0376-8929.

NAL call no.: QH540.E55

Descriptors: vicunas, conservation, reserves, herds, land use, endangered species, economic development, natural resources, resource management, Peru, Chile.

Bianchi, N.O.; Larramendy, M.L.; Bianchi, M.S.; Cortes, L. **Karyological conservatism in South American camelids.** *Experientia*. June 15, 1986; 42(6): 622-624. ill. ISSN: 0014-4754.

NAL call no.: 475 EX7

Descriptors: camels, llamas, karyotypes, chromosome morphology, genetic variability, South America.

Cramer, C. **Big bucks from bizarre breeds.** *New Farm*. Sept/Oct 1986; 8(6): 20-24. ill. ISSN: 0163-0369.

NAL call no.: S1.N32

Descriptors: livestock farming, exotics, bison, *Cervus canadensis*, llamas, *Dama dama*, pheasants, prices, markets, Iowa.

Guttler, Eva. **Untersuchungen über die Haltung, Zucht, Physiologie und Pathologie der Fortpflanzung und Krankheiten von Lamas in den Anden Argentiniens. [Investigations on management, breeding, physiology and pathology of reproduction in llamas in the Andes of Argentina.]** *Inaugural Dissertation / Justus Liebig Universität Giessen, Fachbereich Veterinärmedizin und Tierzucht*; 1986 [no. 28]. Giessen: [s.n.], 1986. 169 p., ill., maps. Note: In German with summaries in English and Spanish.

NAL call no.: 41.2 G3642 1986 [no. 28]

Descriptors: llamas, breeding, care, physiology, pathology, reproduction.

Hart, Kelly; Goldsmith, Bobra. **Llama Training with Bobra Goldsmith: What Every Llama Should Know.** Juniper Ridge Press, Ashland, OR. c1986. 1 videocassette (114 min.): sd., col.

NAL call no.: Videocassette no. 1358

Descriptors: llamas, training methods, behaviors, restraint, handling.

Heller, R.; Cercasov, V.; Engelhardt, W.V. **Retention of fluid and particles in the digestive tract of the llama (*Lama guanacoe F. glama*).** *Comparative Biochemistry and Physiology. A. Comparative Physiology*. 1986; 83(4): 867-691. ill. ISSN: 0300-9629.

NAL call no.: QP1.C6

Descriptors: llamas, digestive tract motility, digestive juices, forestomach, particle size, retention.

Jefferson, R.T. Jr.; Franklin, W.L. **Behavioral considerations in the live capture of guanacos with spring-activated foot snarls.** *Iowa Academy of Science*. 1986; 93(2): 48-50. ISSN: 0085-2236.

NAL call no.: 500 IO93

Descriptors: guanacos, live capture, foot snarls, behavioral impacts of capture method.

Lassen, E.D.; Pearson, E.G.; Long, P.; Schmotzer, W.B.; Kaneps, A.J.; Riebold, T.W. **Clinical biochemical values of llamas: reference values.** *American Journal of Veterinary Research*. Oct 1986; 47(10): 2278-2280. ISSN: 0002-9645.

NAL call no.: 41.8 Am3A

Descriptors: llamas, blood analysis, blood serum, blood composition.

Reiner, R.J.; Bryant, F.C. **Botanical composition and nutritional quality of alpaca diets in two Andean rangeland communities.** *Journal of Range Management*. Sept 1986; 39(5): 424-427. ISSN: 0022-409X.

NAL call no.: 60.18 J82

Descriptors: alpacas, diet studies, botanical composition, nutritional value, rangelands, plant communities, seasonality, mountain grasslands, grazing, sites, Andes mountains, bofedal and atiplano site, Peru.

Schneider, H.E.; Pohle, V. **Vergiftungen durch Rhododendronblätter bei Lamas und Ziegen. [Intoxication Llamas and goats from rhododendron leaves.** In: *Erkrankungen der Zootiere: Verhandlungsbericht des 28. Internationalen Symposiums über die Erkrankungen der Zootiere vom 28. April bis 3. Mai 1986 in Rostock / herausgegeben von Rudolf Ippen und Hans Dieter Schroder.* Akademie Verlag, Berlin. 1986. p. 237-240. ISBN: 3055001478. Note: In German with summaries in English, German, Russian and French.

NAL call no.: SF996.I5 1986

Descriptors: goats, llamas, poisoning, ingestion toxicity, rhododendron leaves, therapy, detoxicants, *Atropinum sulfuricum*.

Sumar, J.; Garcia, M. **Reproductive physiology of the alpaca. [Fisiologia de reproduccion de la alpaca.]** In: *Nuclear and Related Techniques in Animal Production and Health: Proceedings of an International Symposium / jointly organized by the International Atomic Energy Agency. [et al.].* International Atomic Energy Agency, Vienna. 1986. p. 149-177. ill. ISBN: 9200102867.

NAL call no.: SF5.I57 1986

Descriptors: alpaca, reproductive physiology, genitalia, ovulation, progesterone, pregnancy, insemination.

Taylor/Gavin Communications. **All about Llamas.** Taylor/Gavin Communications, Bozeman, MT. 1986 videocassettes: sd., col., 1 guide to tape 2.

NAL call no.: Videocassette no. 1330

Descriptors: llamas, llama pack camping, care, breeding.

Abstract: Intended as a guide for llama owners, the video discusses basic care techniques including specific details and examples of breeding methods, birthing methods, newborn care and expectations and specific instruction for owners to assist in these procedures. Also discusses how to go packing with llamas instead of horses or mules and what types of equipment to carry.

1985

Baumgartner, W.; Zajac, A.; Hull, B.L.; Andrews, F.; Garry, F. **Parelaphostrongylosis in llamas.** *Journal of the American Veterinary Medical Association.* Dec 1, 1985; 187(11): 1243-1245. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, *Parelaphostrongylus tenuis*, parasitic nematodes, meningitis, paraplegia, histopathology, Ohio.

Abstract: Two llamas from a herd of 15 which shared pastures with white tailed deer in Southeast Ohio, USA, developed posterior ataxia and weakness. Hematological abnormalities were not found. The llamas were killed at three weeks. Nematodes were found in the cervical portion of and thoracic portions of the spinal cords. They were identified as immature female *Parelaphostrongylus tenuis*. Antemortem diagnosis was based on eosinophilic meningitis and paraplegia, and the fact that the pasture was shared with white tailed deer.

Bustinza Choque, Victor. Universidad Nacional Tecnica del Altiplano (Peru). Proyecto Piel de Alpaca. **Alpaca Hydres [Hides?]**. Universidad Nacional del Altiplano, Instituto de Investigaciones para el Desarrollo Social del Altiplano, Puno [Peru]. [1985] 189 p., ill.

NAL call no.: HD9904.P53P867 1985

Descriptors: alpacas, wool industry, rural development projects, textile industry.

Cueto, Luis J.; F. Ponce, Carlos; Food and Agriculture Organization of the United Nations. **Management of vicuna: its contribution to rural development in the High Andes of Peru.** *FAO Conservation Guide.* Food and Agriculture Organization of the United Nations, Rome. 1985; no. 11, 38 p., ill. ISBN: 9251022240.

NAL call no.: S900.F6 no.11

Descriptors: vicuna, rural development, projects, Peru.

Llamas. [Bob Dal Porto, Elk Grove, Calif.], 1985- v.: ill. ISSN: 0887-9923.

NAL call no.: SF401.L6L636

Descriptors: llamas, periodicals.

Miller, W.J.; Hollander, P.J.; Franklin, W.L. **Blood typing South American camelids.** *Journal of Heredity*. 1985; 76: 369-371. ISSN 1465-7333 (online). ISSN 0022-1503 (print).

URL: <http://jhered.oxfordjournals.org/>

NAL call no.: 442.8 AM3

Descriptors: camelids, *Lama*, blood sampling, blood typing, hematological factors, South America.

Nakashima, M.; Noda, H.; Hasegaea, M.; Ikai, A. **The oxygen affinity of mammalian hemoglobins in the absence of 2,3 diphosphoglycerate in relation to body weight.** *Comparative Biochemistry and Physiology. A. Comparative Physiology*. 1985; 82(3): 583-589. ill. ISSN: 0300-9629.

NAL call no.: QP1.C6

Descriptors: sheep, man, llamas, pigs, cows, horses, rabbits, oxygen consumption, hemoglobin, body weight, diphosphoglycerate.

Purdy, C.M.; Lochner, F.K. **Proximal radial fracture in a llama.** *Equine Practice*. Nov/Dec 1985; 7(10): 12-15. ill. ISSN: 0162-8941.

NAL call no.: SF951.E62

Descriptors: llamas, radius, bone fractures, fixation, diagnosis.

Rabinovich, J.E.; Hernandez, M.J.; Cajal, J.L. **A simulation model for the management of vicuna populations.** *Ecological Modelling*. Dec 1985; 30(3/4): 275-295. ISSN: 0304-3800.

NAL call no.: QH541.15.M3E25

Descriptors: vicunas, *Vicugna vicugna*, population dynamics, population density, harvesting, mathematical models, computer simulation, resource management, decision making, conservation, profits, Peru, Argentina.

Seigle, N. **The allure of the llama.** *Farmline. U.S. Department of Agriculture, Economic Research Service*. Mar 1985; 6(3): 12. ISSN: 0270-5672.

Descriptors: llamas, breeding, prices, imports, wool.

Wiepz, D.W.; Chapman, R.J. **Non surgical embryo transfer and live birth in a llama.** *Theriogenology*. Aug 1985; 24 (2): 251-257. ill. ISSN: 0093-691X.

NAL call no.: QP251.A1T5

Descriptors: llamas, embryos animal, transferring, embryo mortality.

Wilson, P.; Franklin, W.L. **Male group dynamics and inter-male aggression of guanacos in southern Chile.** *Zeitschrift fur Tierpsychologie*. 1985; 69: 305-328.

Descriptors: guanacos, males, behavior in single gender groups, inter-male aggression, Chile.

1984

Bryant, F.C.; Farfan, R.D. **Dry season forage selection by alpaca (*Lama pacos*) in southern Peru.** *Journal of Range Management*. July 1984; 37(4): 330-333. ill. ISSN: 0022-409X.

Descriptors: alpacas, *Lama pacos*, grazing behavior, foraging, food habits, diets, seasonal behavior, dry season, vegetation, Peru.

Bustinza Choque, A.V. **The Camelidae of South America.** In: W. Ross Cockrill (Editor). *The Camelid: an All Purpose Animal*. Scandinavian Institute of African Studies, Uppsala. c1984 c1985; 1: 112-143. ill., maps. ISBN: 9171062289.

NAL call no.: SF401.C2K48 1979

Descriptors: Camelidae, alpaca, *Lama*, llamas, vicunas, guanacos, history, habitats, breeds, meat production, wool production, wool, South America.

Calle-Escobar, Rigoberto. **Animal Breeding and Production of American Camelids.** Printed by Talleres Graficos de Abril, Lima, Peru; [3-R Ranch, Mt. Shasta, CA, distributor], 1984. 358 p., [34] p. of plates, ill. (some col.).

NAL call no.: SF401.A4C3413 1984

Descriptors: alpacas, breeding, llamas, vicunas, guanacos.

Engelhardt, W. von; Rubsamén, K., Heller, R. **The digestive physiology of camelids.** In: W. Ross Cockrill (Editor). *The Camelid: an All Purpose Animal*. Scandinavian Institute of African Studies, Uppsala. c1984 c1985; 1: 323-346. ISBN: 9171062289.

NAL call no.: SF401.C2K48 1979

Descriptors: Camelidae, camels, *Lama*, digestion, nutrition physiology, stomach motility, forestomach, digesta.

Heller, R.; Gregory, P.C.; Engelhardt, W. von. **Pattern of motility and flow of digesta in the forestomach of the llama (*Lama guanacoe F. glama*).** *Journal of Comparative Physiology. B. Biochemical, Systemic, and Environmental Physiology*. 1984; 154(5): 529-533. ill. ISSN: 0174-1578.

NAL call no.: QP33.J681

Descriptors: llamas, forestomach, motility, digesta.

Iowa State University Research Foundation; Franklin, W.L. **Guanacos of the Patagonia: A Study of Behavior and Ecology** (English and Spanish versions). 1984. Note: This videotape was directed by Megan Epler-Wood, Produced by and based upon the research of W.L. Franklin. It was the winner of 7 international film festival awards, including The Best International Non-Commercial Behavioral Film 1980-1985 by the Animal Behavior Society. Distributed by Walter H. Derlet International Film Bureau.

Availability: On file at Iowa State University Library: Media VIDE 007 697.

Descriptors: guanacos, behaviors, ecology, social structure, habitat, diets, reproduction, wild animal resource, fiber, South America.

Koch, M.D. **Canine tooth extraction and pulpotomy in the adult male llama.** *Journal of the American Veterinary Medical Association*. Dec 1, 1984; 185(11): 1304-1306. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, teeth, dentistry, pulpotomy.

Marshall, R.C.; Zahn, H.; Blankenburg, G. **Possible identification of specialty fibers by electrophoresis.** *Textile Research Journal*. Feb 1984; 54(2): 126-128. ill. ISSN: 0040-5175.

NAL call no.: 304.8 T293

Descriptors: hair fibers, fleece, identification techniques, goats (mohair, cashmere), camel, alpaca, vicuna, angora rabbit.

Novoa, C.; Wheeler, J.C. **Llama and alpaca.** In: Ian L. Mason (Editor). *Evolution of Domesticated Animals*. Longman, London. 1984. p. 116-128. maps. ISBN: 0582460468.

NAL call no.: S41.E93

Descriptors: llama, alpaca, domestication, distribution, history, evolution.

Schnieder, T.; Kaup, F.J.; Drommer, W.; Thiel, W.; Rommel, M. **Zur Feinstruktur und Entwicklung von *Sarcocystis aucheniae* beim Lama. [Fine structure and development of *Sarcocystis aucheniae* of the llama.]** *Zeitschrift für Parasitenkunde Research*. 1984; 70(4): 451-458. ill. ISSN: 0044-3255. Note: In German with an English abstract.

NAL call no.: 442.8 Z33F

Descriptors: *Sarcocystis*, ultrastructure, life history, llamas, dogs, cysts passed through dog and cat, cyst morphology in muscle tissue.

Sumar, J.; Settergren, I. **Gonadal hypoplasia in the alpaca (*Lama pacos*) in Peru.** *10th International Congress on Animal Reproduction and Artificial Insemination, University of Illinois at Urbana Champaign, Illinois, USDA, June 10-14, 1984*. [University of Illinois at Urbana Champaign?, Urbana?, 1984?]. 3: 472.1-472.2.

NAL call no.: SF105.5.I5 1984

Descriptors: alpaca, hypoplasia, gonads, Peru.

Sumar, J. **Reproductive physiology in South American Camelids.** In: R.B. Land and D.W. Robinson *Genetics of Reproduction in Sheep*. Butterworths, London. 1984. p. 81-95. ill. ISBN: 0407003029.

NAL call no.: SF376.2.G46

Descriptors: alpaca, llamas, reproductive physiology, reproductive organs animal, South American Camelidae.

Torres, Hernan. **Distribucion y conservacion de la vicuna (*Vicugna vicugna*): informe. [Distribution and conservation of the vicuna.] *Informe Especial (International Union for Conservation of Nature and Natural Resources*, no. 1. International Union for Conservation of Nature and Natural Resources, IUCN, Gland, Switzerland. 1984. 15, [3], 14 p., ill. ISBN: 2880329035.**

NAL call no.: QL737.U54T67

Descriptors: vicunas, geographical distribution, wildlife conservation, South America.

1983

Fowler, M.E. **The jugular vein of the llama (*Lama peruana*): a clinical note cervical venous anatomy.** *Journal of Zoo Animal Medicine*. June 1983; 14(2): 77-78. ill. ISSN: 0093-4526.

NAL call no.: SF601.J6

Descriptors: llama, venous anatomy, jugular.

Franklin, W.L. **Contrasting socioecologies of South American wild camelids: the vicuna and the guanaco.** In: J.F. Eisenberg; D.G. Kleiman (Editors). *Advances in the Study of Mammalian Behavior. Special Publication.* American Society of Mammals. No. 7. 1983. p. 573-629.

Descriptors: guanacos, vicunas, wild animals, species comparison, social behaviors, habitat choices, natural history, South America.

Galotta, D.R.; Nuevo Freire, C.M.; Galotta, J.M. **Contribucion a la anatomia de los camelidos sudamericanos. I. Las Almohadillas digitales de la llama (*L. glama guanicoe f. d. glama*, Linnaeus 1758). [Anatomy of the South American Camelidae. I. Digital pads of the llama (*Lama glama guanicoe f. d. glama*, Linnaeus 1758).] *Revista de Ciencias Agrarias*. Buenos Aires, Facultad de Ciencias Agrarias, Universidad Catolica Argentina. July/Dec 1983; 4(3/4): 5-13. ill. Note: In Spanish.**

NAL call no.: S15.R39

Descriptors: llamas, foot structure, digital pads, external and internal anatomy.

Heller, Rolf. **Vormagenmotorik und Passage von festem und flussigem Inhalt durch die Vormagen des Lamas. [Forestomach motility and passage of solid and fluid content through the forestomach in llamas.] *Hohenheim. Universitat. Dissertation*; 1983 no. 3. Hohenheim: s.n., 1983. 101 p. Note: In German with an English summary.**

NAL call no.: 105.8 H686D 1983 no.3

Descriptors: llamas, gastric structure and action, forestomach.

Hofmann, Rudolf K. **El manejo de la vicuna silvestre. [Management of the Wild Vicuna.]** G.T.Z., Eschborn. 1983. 2 v.: ill. (some col.), maps. ISBN: 3880851131. Note: In Spanish.

NAL call no.: SF401.V5M3

Descriptors: vicuna, wildlife conservation research, Peru.

Khodadad, J.K.; Weinstein, R.S. **The band 3 rich membrane of llama erythrocytes: studies on cell shape and the organization of membrane proteins.** *Journal of Membrane Biology*. 1983; 72(3): 161-171. ill. ISSN: 0022-2631.

NAL call no.: QH573.J6

Descriptors: llamas, red blood cells, membrane structure and biochemistry.

Montes, G.; M. Stutzin; J. Correa; A. Glade. **Estudio hematologico, de proteinas totales y fibrinogeno en alpacas (*Lama pacos*) dela Provincia de Parinacota, Chile. [Haematological parameters, total plasmatic protein and fibrinogen in *Lama pacos* alpacas in Parinacota Province, Chile.] *Archivos de Medicina Veterinaria*. Facultad de Medicina Veterinaria, Universidad Austral de Chile, Valdivia. 1983; 15(1): 37-41. ISSN: 0301-732X. Note: In Spanish with an English summary.**

NAL call no.: SF604.A75

Descriptors: alpacas, blood composition, plasma protein, fibrinogen, hemoglobin, packed cell volume.

Reiner, R.; Bryant, F. **A different sort of sheep Alpacas, Peru.** *Rangelands*. June 1983; 5(3): 106-108. ill. ISSN: 0190-0528.

NAL call no.: SF85.A1R32

Descriptors: alpacas, Peru.

1982

Bartels, H. **Welche Eigenschaften begünstigen die Tylopoden für das Leben in grossen Höhen. [Which morphological and functional qualities favor life of Tylopoda at high altitude?]** *Verhandlungen der Deutschen Zoologischen Gesellschaft*. 1982; 75: 185-194. ISSN: 0070-4342. Note: In German with an English abstract.

NAL call no.: 410.9 D48

Descriptors: llamas, camels, Tylopoda, mountain areas, red blood cell characteristics, oxygen affinity, oxygen saturation, cardiac output.

Calle Escobar, Rigoberto. **Produccion y mejoramiento de la alpaca. [Production and Development of the Llama.]** Fondo del Libro, Banco Agrario del Peru, Lima, Peru. 1982. 334 p., 32 p. of plates, ill., ports. Note: In Spanish.

NAL call no.: SF401.L6C34

Descriptors: llamas, livestock production, economic factors, care and management.

Ellis, J. **The hematology of South American Camelidae and their in adaptation to altitude -- llamas, vicunas, guanacos, and alpacas.** *Veterinary Medicine / Small Animal Clinician*. Dec 1982; 77(12): 1796-1802. ill. ISSN: 0042-4889.

NAL call no.: 41.8 M69

Descriptors: llamas, vicunas, guanacos, alpacas, physiological and metabolic adaptations, mountainous areas, South America.

Espinoza, J.E.; McDowell, L.R.; Rodriguez, J.; Loosli, J.K.; Conrad, J.H.; Martin, F.G. **Mineral status of llamas and sheep in the Bolivian Altiplano Highlands.** *Journal of Nutrition*. Dec 1982; 112(12): 2286-2292. ISSN: 0022-3166.

NAL call no.: 389.8 J82

Descriptors: llamas, sheep, mountainous areas, nutritional status, minerals, Bolivia.

Fenwick, B.W.; Kock, M. **Complete choanal atresia in a llama.** *Journal of the American Veterinary Medical Association*. Dec 1, 1982; 181(11): 1409-1410. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, disease of the colon.

Fowler, M.E. **Angular limb deformities in young llamas.** *Journal of the American Veterinary Medical Association*. Dec 1, 1982; 181(11): 1338-1342. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llamas, congenital limb deformities.

Franklin, W.L. **Biology, ecology, and relationship of man to the South American camelids.** In: M.A. Mares; H.H. Genoways (Editors). *Mammalian Biology in South America. Special Publication Series*. Pymatuning Laboratory of Ecology, University of Pittsburg. 1982; 6: 457-487.

Descriptors: camelids, natural resource, biology, natural history, habitat, ecology, relationship with humans, South America.

Franklin, W.L. **Llama language: modes of communication in the South American camelids.** *Llama World*. 1982; 1(2):10-15.

Descriptors: llamas, communication, behaviors, vocalizations, South American camelids.

Kruska, D. **Hirngrossenänderungen bei Tylopoden während der Stammesgeschichte und in der Domestikation. [Changes of brain size in Tylopoda during phylogeny and caused by domestication.]** *Verhandlungen der*

Deutschen Zoologischen Gesellschaft. 1982; 75: 173-183. ill. ISSN: 0070-4342. Note: In German with an English abstract.

NAL call no.: 410.9 D48

Descriptors: llama, alpaca, Tylopoda, affects of domestication.

Loupal, G. **Gastrolithiasis bei einem *Lama*. [Gastric phytobezoariasis in a llama.]** *Berliner und Munchener tierarztliche Wochenschrift*. Jan 1, 1982; 95(1): 14-16. ill. ISSN: 0005-9366. Note: In German with an English summary.

NAL call no.: 41.8 B45

Descriptors: llamas, gastroliths.

Macedo, H. de. **Note on vicuna x alpaca hybrids crossbreeding, Peru.** *Zeitschrift fur Säugetierkunde [International Journal of Mammalian Biology]*. Apr 1982; 47 (2): 117-118. ill. ISSN: 0044-3468.

NAL call no.: QL700.Z4

Descriptors: vicuna, alpaca, hybrids, crossbreeding, characteristics, Peru.

Muir, S.; Pappagianis, D. **Coccidioidomycosis in the llama: case report and epidemiologic survey *Coccidioides immitis*.** *Journal of the American Veterinary Medical Association*. Dec 1, 1982; 181(11): 1335-1337. ill. ISSN: 0003-1488.

NAL call no.: 41.8 Am3

Descriptors: llama, *Coccidioides immitis*, parasitic disease, incidence of disease.

Ricciuti, E.R. **The vicuna victor or victim.** *Animal Kingdom*. June/July 1982; 85(3): 5-14, 18-23. ill. ISSN: 0003-3537.

NAL call no.: 410.9 N483B

Descriptors: vicunas, endangered species, wildlife conservation, slaughter, destruction of animals, wool production, Peru.

Stevens, E.J. **Highland agriculture in Peru. II. Alpaca and sheep farming.** *Review / Tussock Grassland and Mountain Lands Institut*. Dec 1982; (41): 22-28. ill. ISSN: 0577-9898.

NAL call no.: 60.9 C46

Descriptors: alpaca, sheep, livestock production, Andes, Peru.

Western, D. **Perspective: how many vicunas.** *Animal Kingdom*. June/July 1982; 85(3): 16-17. ill. ISSN: 0003-3537.

NAL call no.: 410.9 N483B

Descriptors: vicunas, endangered species, wildlife conservation, resource management, censuses.

1981

Brightman, A.H.; McLaughlin, S.A.; Brumley, V. **Keratoconjunctivitis in a llama *Staphylococcus aureus*, *Moraxella liquefaciens*.** *VMSAC, Veterinary Medicine / Small Animal Clinician*. Dec 1981; 76(12): 1776-1777. ill. ISSN: 0042-4889.

NAL call no.: 41.8 M69

Description: llama, bacterial eye infection, *Staphylococcus aureus*, *Moraxella liquefaciens*, description and treatment.

Cardozo, Armando. **Thoughts on the Production of Sheep and Camel-Like Animals in the Department of Oruno, Bolivia.** Academia Nacional de Ciencias de Bolivia, La Paz. 1981. 120, [8] p., ill. (some col.), maps.

NAL call no.: SF55.B5C37 1981

Descriptors: livestock, Bolivia Oruro Department., forage plants, sheep, *Lama* genus, vicuna.

Miller, R.M. **Azalea poisoning in a llama: a case report.** *Veterinary Medicine / Small Animal Clinician*. Jan 1981; 76(1): 104. ISSN: 0042-4889.

NAL call no.: 41.8 M69

Descriptors: azaleas, llamas, poison, effects, case report.

Rodriguez Claros, Tito. **Importancia de la influencia de factores ambientales sobre algunos caracteres de produccion de carne y lana en llamas (*Lama glama*).** [Importance of the influence of environmental factors on some characteristics of meat and wool production in llamas.] *Escuela Nacional de Agricultura. Tesis* 1981; no. 45. Colegio de Postgraduados, Institucion de Ensenanza e Investigacion en Ciencias Agricolas, Chapingo, Mexico. 1981. 127 p., ill. Note: In Spanish.

NAL call no.: S539.M6E82 1981 no. 45

Descriptors: llamas, meat, fleece, wool quality, environmental effects.

Shklair, I.L. **Natural occurrence of caries in animals animals as vectors and reservoirs of cariogenic flora.** *Proceedings of Animal Models in Cariology.* Information Retrieval, Washington, D.C. 1980 (pub. 1981). p. 41-51.

NAL call no.: QL55.A54

Descriptors: dental decay, llamas, livestock, *Streptococcus mutans*, decay causing microflora.

1980

Palmer, A.C.; Blakemore, W.F.; O'Sullivan, B.; Ashton, D.G.; Scott, W.A. **Ataxia and spinal cord degeneration in llama, wildebeeste and camel.** *Veterinary Record* (London). July 5, 1980; 107(1): 10-11. ISSN: 0042-4900.

NAL call no.: 41.8 V641

Descriptors: camels, muscular coordination, spinal cord, neural tissue functionality, llama, wildebeeste.

Steven, D.H.; Burton, G.J.; Sumar, J.; Nathanielsz, P.W. **Ultrastructural observations on the placenta of the alpaca (*Lama pacos*).** *Placenta.* Jan/Mar 1980; 1(1): 21-32. ill. ISSN: 0143-4004.

NAL call no.: QP281.P53

Descriptors: alpacas, placenta, morphology, South America.

Van Nice, P.; Black, C.P.; Tenney, S.M. **A comparative study of ventilatory responses to hypoxia with reference to hemoglobin O₂ affinity in llama, cat, rat, duck and goose.** *Comparative Biochemistry and Physiology. A.*

Comparative Physiology. 1980; 66(2): 347-350. ill. ISSN: 0300-9629.

NAL call no.: QP1.C6

Descriptors: camel, llama, cat, rat, duck, goose, oxygen affinity, hypoxia, lungs, hemoglobin, breathing behavior.

1979

Franklin, W.L. **Territorial marking behavior by the South American vicuna.** In: C. Muller-Schwarze; R.M. Silverstein (Editors). *Chemical Signals: Vertebrates and Aquatic Invertebrates.* Plenum Press, NY. 1979. p. 53-66. ISBN: 0306403390.

NAL call no.: QL776.S94 1979

Descriptors: vicunas, wild animals, territorial behavior, territorial marking, South America.

Rubsamen, K.; Engelhardt, W. von. **International Symposium on Ruminant Physiology, 5th, Clermont Ferrand, 1979. Morphological and functional peculiarities of the llama forestomach.** *Annales de Recherches Vétérinaires.* 1979; 10(2/3): 473-475. ill. ISSN: 0003-4193.

NAL call no.: SF602.A5

Descriptors: llama, forestomach, structure, function.

1978

Brown, T.T.; Jordan, H.E.; Demorest, C.N. **Cerebrospinal parelophostronglylosis in llamas.** *Journal of Wildlife Diseases.* October 1978; 14(4): 441-444. ISSN: 0090-3558.

NAL call no.: 41.9 W64B

Descriptors: llamas, meningeal worms, parasitic nematodes, *Parelaphostrongylus tenuis*, neurologic disease, Texas.

Abstract: Four llamas near Houston Texas, developed clinical symptoms of neurologic disease. The tissues of two of

the animals showed lesions consistent with a migrating parasite. An adult nematode with the morphology of *Parelophostrongylus tenuis* was found in the brain of one of the animals.

Engelhardt, Wolfgang. **Renale Harnstoffexkretion und renale Konzentrationsfähigkeit beim Lama (*Lama glama*) bei proteinarmen Diäten. [Renal urea excretion and renal concentration capacity of llama (*Lama glama*) in protein poor diet.]** *Hohenheim. Universitat. Dissertation.* 1978, no. 7. Hohenheim: s.n., 1978. 92 p., ill. Note: In German.

NAL call no.: 105.8 H686D 1978 no. 7

Descriptors: llamas, protein, nutrition, kidney functions.

Franklin, W.L. ***Socioecology of the vicuna.*** Utah State University, Logan. Ph.D. dissertation. 1978. 169 p.

Descriptors: vicuna, habitat, ecology, biology, social organization, social behaviors, natural history.

Hinderer, Sieghard. **Kinetik des Harnstoff Stoffwechsels beim Lama bei proteinarmen Diäten. [Kinetics of urea metabolism in llama in protein poor diet.]** *Hohenheim. Universitat. Dissertation,* 1978, no. 45. Hohenheim: s.n., 1978. 123 p., ill. Note: In German with an English summary.

NAL call no.: 105.8 H686D 1978 no. 45

Descriptors: llamas, physiology, nutrition, diet, urea metabolism.

Hofmann, Rudolf. **Utilizacion de la vicuna en el Peru. [Utilization of vicunas in Peru]. [Nutzung der Vikunjas in Peru].** *Deutsche Gesellschaft fur Technische Zusammenarbeit. Schriftenreihe der Deutschen Gesellschaft fur Technische Zusammenarbeit.* no. 44. Eschborn: [s.n.], 1978. 47 p., col. ill., maps. ISBN: 3880850488. Note: In Spanish, English and German.

NAL call no.: HD1417.B8 no. 44

Descriptors: vicunas, wild life management, biology, continually growing incisors, fine thick fleece, social structure, use, care, economic value, habitat, repopulation project, project goals and objectives, species conservation, Andean farmers, Pampas Galeras Vicunga Reserve, Peruvian puna, vegetation, Peru.

Sumar, J.; Smith, G.W.; Mayhua, E.; Nathanielsz, P.W. **Adrenocortical function in the fetal and newborn alpaca.** *Comparative Biochemistry and Physiology. A. Comparative Physiology.* 1978; 59(1): 79-84. Ref.

NAL call no.: QP1.C6

Descriptors: alpaca, fetus, adrenal gland, function.

1977

Braunitzer, G.; Schrank, B.; Stangl, A.; Bauer, C. **Regulation of respiration at high altitudes and its molecular interpretation: The sequence of beta chains of hemoglobins from pig and llama.** *Hoppe-Seyler's Zeitschrift für Physiologische Chemie.* July 1977; 358(7): 921-925. Ref.

NAL call no.: 384 Z38

Descriptors: llama, pig, sow, hemoglobin, structural differences, adaptations for high altitudes.

Braunitzer, G.; Schrank, B.; Stangl, A. **The sequence of alpha chains from pig and llama hemoglobins (aspects on the respiration in highlands).** *Hoppe-Seyler's Zeitschrift für Physiologische Chemie.* Mar 1977; 358(3): 409-412. Ref.

NAL call no.: 384 Z38

Descriptors: llamas, pigs, hemoglobin, molecular structure.

Cardozo, Armando. **Bibliografia de los camelidos sudamericanos. [Bibliography of South American Camelidae.]** Universidad Nacional de Jujuy, Jujuy, Argentina. 1977. ix, 93 p.

NAL call no.: Z5074.C2C3

Descriptors: Camelidae, bibliography, llamas, South American camelids.

Orlove, Benjamin S. **Alpacas, sheep, and men: the wool export economy and regional society of southern Peru.** *Studies in Anthropology Series.* Academic Press, New York. 1977. xx, 270 p., ill.

NAL call no.: HD9904.P53S56

Descriptors: wood trade and industry, alpacas, sheep rural economy, Sicuani region, Peru.

1976

Bezrukov, N.I. **The growth oocytes and folliculi in Tylopoda.** *Arkhiv Anatomii, Gistologii i Embriologii.* May 1976; 70(5): 32-38. Ref.

NAL call no.: QL801.A7

Descriptors: camelids, reproduction, egg development, suborder Tylopoda.

Engelhardt, W.; Engelhardt, W. von. **Diminished renal urea excretion in the llama at reduced food intake.** In: *Tracer Studies on Non-Protein Nitrogen for Ruminants III; Proceedings of a Research Coordination Meeting*, 1976, p. 61-62.

NAL call no.: SF98.N5R3 1976

Descriptors: llama, kidney, urea excretion, food restrictions, impacts.

Heath, D.; Smith, P.; Harris, P. **Clara cells in the llama.** *Experimental Cell Biology.* 1976; 44(2): 73-82.

NAL call no.: 448.8 SCH9

Descriptors: llama, bronchioles, clara cells.

Hinderer, S.; Engelhardt, W. von. **Entry of blood urea into the rumen of the llama.** In: *Tracer Studies on Non Protein Nitrogen for Ruminants III; Proceedings of a Research Coordination Meeting*, 1976, p. 59-60.

NAL call no.: SF98.N5R3 1976

Descriptors: llama, rumen metabolism, urea processing.

Lewis, J.H. **Comparative hematology: studies on Camelidae.** *Comparative Biochemistry and Physiology. A. Comparative Physiology.* 1976; 55(4): 367-371.

NAL call no.: QP1.C6

Descriptors: camels, llamas, guanacos, blood studies, comparisons.

Rubsamen, Klaus. **Secretion and resorption in the cardiac gland zone of the llama.** Hohenheim. Universitat. Dissertation. 1976, no. 27] Hohenheim: [s.n.], 1976. 82 p., ill.

NAL call no.: 105.8 H686D 1976 no. 27

Descriptors: llama, cardiac gland, changes.

Sato Sato, A.; Kian Tobaru, O.T. **On the morphology of the cerebellum of the alpaca (*Lama pacos*).** *Zentralblatt für Veterinärmedizin. Reihe C. Anatomia, Histologia, Embryologia.* June 1976; 5 (2): 105-112. Ref.

NAL call no.: SF761.Z4

Descriptors: alpacas, brain structure, cerebellum.

Sillau, A.H.; Cueva, S.; Valenzuela, A.; Candela, E. **O₂ transport in the alpaca (*Lama pacos*) at sea level and at 3,300 meters.** *Respiration Physiology.* Aug 1976; 27(2): 147-155. Ref.

NAL call no.: QP121.A1R4

Descriptors: llamas, oxygen transport, high elevations.

Treus, V.D.; Lobanov, N.V. **Acclimatization of Tylopoda in Askania Nova.** *Vestnik Zoologii.* Jan/Feb 1976; 1: 3-9, map. Ref.

NAL call no.: QL1.V4

Descriptors: llamas, camels, breeding, suborder Tylopoda, adaption to USSR.

1975

Baumann, I.; Bligh, J.; Vallenias, P.A. **Temperature regulation in the alpaca (*Lama pacos*): thermoregulatory-consequences and inconsequences of injections of noradrenaline, 5 hydroxytryptamine, carbamyl choline and**

prostaglandin E1 into a lateral cerebral ventricle. *Comparative Biochemistry and Physiology. A. Comparative Physiology.* Jan 1975; 50(1): 105-109. Ref.

NAL call no.: QP901.C6

Descriptors: alpaca, body temperature regulation, brain, injections.

Bligh, J.; Baumann, I.; Sumar, J.; Pocco, F. **Studies of body temperature patterns in South American Camelidae.** *Comparative Biochemistry and Physiology. A. Comparative Physiology.* Apr 1, 1975; 50(4A): 701-708. Ref.

NAL call no.: 444.8 C73

Descriptors: alpaca, llama, vicuna, body temperature.

Fernandez Baca, S. **Alpaca raising in the high Andes.** *World Animal Review.* 1975; 14: 1-8. Ref.

NAL call no.: SF191.W6

Descriptors: alpacas, livestock production systems, Peru, Bolivia.

Franklin, W.L. **Guanacos in Peru.** *Oryx.* 1975; 13(2): 191-202. ISSN: 0030-6053.

NAL call no.: 410 OR9

Descriptors: guanacos, behavior, populations, socioecology, Peru.

Hinderer, S.; Engelhardt, W. von. **Urea metabolism in the llama.** *Comparative Biochemistry and Physiology. A. Comparative Physiology.* Dec 1, 1975; 52(4A): 619-622. Ref.

NAL call no.: QP1.C6

Descriptors: llama, diet, urea.

Leite, R.C.; H. Negrelli Filho; C.H. Langenegger. **Corynebacterium equi infection in a llama (*Lama glama*).** *Pesquisa Agropecuária Brasileira. Série Veterinária.* 1975; 10(8): 57-59. Ref.

NAL call no.: SF604.P4

Descriptors: llama, bacterial infections, *Corynebacterium equi*.

Pardo, M.; Grauer, R.C.; Swart, J.H.; Hartsock, R.J. **Scanning electron microscopy of elliptocytes in man and llama.** *Proceedings Electron Microscopy Society of America.* 1975; 33: 510-511.

NAL call no.: QH201.E4

Descriptors: humans, llamas, elliptocytes, morphology.

Reynafarje, C.; Faura, J.; Villavinencio, D.; Curaca, A.; Reynafarje, B.; Oyola, L.; Contreras, L.; Vallenias, E.; Faura, A. **Oxygen transport of hemoglobin in high altitude animals (Camelidae).** *Journal of Applied Physiology.* May 1975; 38(5): 806-810. Ref.

NAL call no.: 447.8 J825

Descriptors: llamas, alpacas, vicunas, hemoglobin efficiency, oxygen transport.

Rubsamen, K.; Engelhardt, W. von. **Water metabolism in the llama.** *Comparative Biochemistry and Physiology. A. Comparative Physiology.* Dec 1, 1975; 52(4A): 595-598. Ref.

NAL call no.: QP1.C6

Descriptors: llama, goat, water physiology.

1974

Angel Ferrari, D.R. **Two treatments applied to vicunas (*Vicugna*) in captivity.** *Gaceta Veterinaria.* Apr 1974; 36(286): 236-243. Ref.

NAL call no.: 41.8 G112

Descriptors: vicunas, sterility, treatment, Argentina.

Calle Escobar, R. **Role of nutrition in rearing alpacas.** *Ovina.* Nov/Dec 1974; 37(435/436): 16-17.

NAL call no.: 45.8 OV4

Descriptors: alpacas, diet.

Cardozo, A. **Factors in livestock production in the high Andes.** *Informes de Conferencias, Cursos y Reuniones, IICA Interamericano Instituto Ciencias Agricolas.* 1974; 54: 152-182.

NAL call no.: S401.I56

Descriptors: cattle, sheep, goats, llamas, alpacas, livestock production, meat, milk, wool, South America.

Engelhardt, W. von; Becker, G.; Engelhardt, W.; Hauffe, R.; Hinderer, S.; Rubsam, K.; Schneider, W. **Energy, water and urea metabolism in the llama.** In: *Tracer Studies on Non-Protein Nitrogen for Ruminants II; Proceedings of a Research Coordination Meeting & Panel.* 1974 (pub. 1975), p. 111-122. Ref.

NAL call no.: SF95.P37 1974

Descriptors: llama, metabolism, energy, water, urea.

Franklin, W.L. **The social behavior of the vicuna.** In: V. Geist; F. Walther (Editors). *The Behavior of Ungulates and its Relation to Management.* IUCN, Morges. 1974. p. 447-487.

Descriptors: vicunas, wild animals, behaviors, social structures, concerns for sustained management.

Grunberg, W.; Preisinger, A. **Bobierrit newberyit concretions in the glandular sacs of the forestomach of *Lama lama*.** *Experienti.* Sept 15, 1974; 30(9): 1047-1048.

NAL call no.: 475 EX7

Descriptors: llamas, gastric concretions, fore stomach sacs.

Kubicek, J. **Semen collecting in alpaca with a urethral fistel.** *Zeitschrift für Tierzucht und Züchtungsbiologie.* Mar 1974; 90(4): 335-351. Ref.

NAL call no.: 442.8 Z35

Descriptors: alpaca, semen collection, fistula to urethra.

Ortiz, C.; Cavero, J.; Sillau, H.; Cueva, S. **The parotid saliva of the alpaca (*Lama pacos*).** *Research in Veterinary Science.* Jan 1974; 16(1): 54-56.

NAL call no.: 41.8 R312

Descriptors: alpacas, parotid saliva analysis.

Schneider, W.; Hauffe, R.; Engelhardt, W. von. **Energy and nitrogen exchange in the llama.** *Publication / European Association for Animal Production.* 1974; 14: 127-130.

NAL call no.: 49.9 EU7

Descriptors: llamas, nutrition, energy/nitrogen balances.

Sumar, K.J. **The South American Camelidae as production factors in the high Andes.** *Informes de Conferencias, Cursos y Reuniones, IICA Interamericano Instituto Ciencias Agricolas.* 1974; 54: 311-322.

NAL call no.: S401.I56

Descriptors: llamas, alpacas, livestock production, rural economy, high elevations, Andes, South America.

1973

Eckerlin, R.H.; Stevens, C.E. **Bicarbonate secretion by the glandular saccules of the llama stomach.** *Cornell Veterinarian.* July 1973; 63(3): 436-445. Ref.

NAL call no.: 41.8 C81

Descriptors: llamas, gastric secretions, bicarbonate.

Franklin, W.L. **Conservation of the vicuna in Peru.** In: P. Jackson (Editor). *World Wildlife Yearbook 1972-73.* World Wildlife Fund, Morges. 1973. p. 209-232.

Descriptors: vicuna, wild animals, natural resource conservation, recommendations, populations levels, mountain areas, Peru.

Hintz, H.F.; Schryver, H.F.; Halbert, M. **A note on the comparison of digestion by New World camels, sheep and**

ponies. *Animal Production*. June 1973; 16(3): 303-305. Ref.

NAL call no.: 49 AN55

Descriptors: camelids, New World camels, llamas, alpacas, vicunas, guanacos, ponies, digestion of feed, comparison study.

1972

Banchero, N.; Grover, R.F. **Effect of different levels of simulated altitude on O₂ transport in llama and sheep.**

American Journal of Physiology. May 1972; 222(5): 1239-1245. Ref.

NAL call no.: 447.8 AM3

Descriptors: llama, sheep, oxygen transport, effects of altitude, experiment.

Calle Escobar, R. **Rearing and improvement of alpacas.** *Peru Ministerio de Agricultura Boletin*. Mar 1972; no. 19, 65 p.

NAL call no.: S15.P47

Descriptors: alpacas, breeding, care and management, Peru.

Cummings, J.F.; Munnell, J.F.; Vallenas, A. **The mucigenous glandular mucosa in the complex stomach of two New World camelids, the llama and guanaco.** *Journal of Morphology*. May 1972; 137(1): 71-109. Ref.

NAL call no.: 444.8 J826

Descriptors: llamas, guanacos, gastric mucosa.

Engelhardt, H.P.W. von. **Resorption and secretion in the rumen of the llama.** *Zentralblatt fur Veterinarmedizin*.

Reihe A. Feb 1972; 19(2): 117-132. Ref.

NAL call no.: 41.8 Z5

Descriptors: llama, rumen, fluid metabolism.

Miller, P.D.; Alexander, A.F.; Lebel, J.L.; Banchero, N. **Iatrogenic myocardial infarction and mitral valve insufficiency in a llama (*Lama glama*).** *American Journal of Veterinary Research*. Mar 1972; 33(3): 639-647. Ref.

NAL call no.: 41.8 AM3A

Descriptors: llamas, cardiac conditions, cardiac valves.

1971

Fernandez-Baca A., Saul. **La alpaca: reproduccion y crianza. [The alpaca: reproduction and breeding].** *Boletin de Divulgacion (Universidad Nacional Mayor de San Marcos. Instituto Veterinario de Investigaciones Tropicales y de Altura. Centro de Investigacion)*, no. 7. IVITA, Lima, Peru. [1971] 43 p., ill. "Direccion de Investigacion, Universidad Nacional Mayor de San Marcos." "Julio de 1971." "Contrato U.N.M. de S.M.--Zona Agraria XII (Puno) del Ministerio de Agricultura." Errata slip inserted. Note: In Spanish with and English summary.

NAL call no.: SF401.A4F47 1971

Descriptors: alpacas, reproduction, breeding, Peru.

Franklin, W.L. **Vicuna survey, Peru.** In: P. Jackson (Editor). *World Wildlife Yearbook 1970-71*. World Wildlife Fund, Morges. 1971. p. 145-148.

Descriptors: vicuna, population levels, survey, high mountain areas, wild animals, natural resource assessment, Peru.

Guerrero, C.A.; Hernandez, J.; Bazalar, H.; Alva, J. ***Eimeria macusaniensis* n. sp. (Protozoa: Eimeriidae) of the alpaca, *Lama pacos*.** *Journal of Protozoology*. Feb 1971; 18(1): 162-163.

NAL call no.: 439.8 J82

Descriptors: alpaca: parasitic protozoa, *Eimeria macusaniensis*, new species.

Vallenas, A.; Cummings, J.F.; Munnell, J.F. **A gross study of the compartmentalized stomach of two New World camelids, the llama and guanaco.** *Journal of Morphology*. Aug 1971; 134(4): 399-424. Ref.

NAL call no.: 444.8 J826

Descriptors: llamas, guanacos, gross stomach anatomy.

Vallenias, Augusto. *Structural and Functional Studies of the Llama and Guanaco Stomach*. University Microfilms, Ann Arbor, Mich. 1971. ix, 93 leaves.

NAL call no.: DISS 70 23,092

Descriptors: llama, guanaco, stomach anatomy and function.

Vallenias P.A.; Stevens, C.E. **Volatile fatty acid concentrations and pH of llama and guanaco forestomach digesta**. *Cornell Veterinarian*. Apr 1971; 61(2): 238-252.

NAL call no.: 41.8 C81

Descriptors: llama, guanaco, cattle, sheep, forestomach, acidity of digesta, comparison study.

1970

Fernandez Baca, S.; Hansel, W.; Novoa, C. **Corpus luteum function in the alpaca**. *Biology of Reproduction*. Oct 1970; 3(2): 252-261.

NAL call no.: QL876.B5

Descriptors: alpaca, ovarian follicle, corpus luteum, role in reproduction, hormones.

Fernandez Baca, S.; Madden, D.H.L.; Novoa, C. **Effect of different mating stimuli on induction of ovulation in the alpaca**. *Journal of Reproduction and Fertility*. July 1970; 22(2): 261-267.

NAL call no.: 442.8 J8222

Descriptors: alpaca, mating behavior, relationship to ovulation.

Fernandez Baca, S.; Hansel, W.; Novoa, C. **Embryonic mortality in the alpaca**. *Biology of Reproduction*. Oct 1970; 3(2): 243-251.

NAL call no.: QL876.B5

Descriptors: alpaca, embryo mortality.

Fernandez Baca, Saul. *Luteal Function and the Nature of Reproductive Failures in the Alpaca*. 1970. xii, 173 leaves.

NAL call no.: DISS 70 23,109

Descriptors: alpaca, ovaries, reproductive physiology and dysfunction.

Novoa, C. **Reproduction in Camelidae**. *Journal of Reproduction and Fertility*. June 1970; 22(1): 3-20.

NAL call no.: 442.8 J8222

Descriptors: camels, llamas, alpacas, reproduction, anatomy, structure, hormones, behavior.

Pattyn, S.R.; Antoine Portaels, F.; Kageruka, P.; Gigase, P. **Mycobacterium microti infection in a zoo llama: Lama vicugna (Molina)**. *Societe Royale de Zoologie d'Anvers Bulletins*, Sept 1970; 51: 17-24.

NAL call no.: 410.9 SO193

Descriptors: llama, *Mycobacterium microti*, captive animal, case study.

1969

Gade, D.W. **The llama, alpaca and vicuna: fact vs. fiction** *Journal of Geography*. Sept 1969; 68(6): 339-343, map.

NAL call no.: 278.8 J82

Descriptors: llama, alpaca, vicuna, facts about husbandry, care, behavior, life history.

Steklenev, E.P. **On the anatomo-morphological characteristics of the structure and physiological function of the oviduct in camels (Lama and Camelus genera)**. *International Congress on Animal Reproduction and Artificial Insemination [Proceedings]*, 1968 (pub. 1969), 6th congr., 1: 71-74.

NAL call no.: SF105.5.I5

Descriptors: camels, genus *Lama*, oviduct, structure, anatomy, physiology.

1968

Foote, W.C.; England, B.G.; Wilde, M.E. **Llama reproduction: a South American problem.** *Utah Science*. June 1968; 29(2): 43-45.

NAL call no.: 100 Ut1F

Descriptors: reproduction, breeding rates.

Heath, D.; Harris, P., Castillo, Y.; Arias-Stella, J. **Histology, extensibility and chemical composition of the pulmonary trunk of dogs, sheep, cattle and llamas living at high altitude.** *Journal of Pathology and Bacteriology*. July 1968; 96(1): 161-167.

NAL call no.: 448.8 J82

Descriptors: pulmonary systems, lungs, anatomy, structure, composition, effects of high altitude.

San Martin, M.; Copaira, M., Zuniga, J.; Rodreguez, R.; Bustinza, G.; Acostaand, L. **Aspects of reproduction in the alpaca.** *Journal of Reproduction and Fertility*. Aug. 1968; 16(3): 395-399.

NAL call no.: 442.8 J8222

Descriptors: reproduction, behavior, anatomy, sex organs.

Souteyrand-Boulenger, J.D. **Muscle articulaire de la hanche chez les camelides. [The articularis coxae muscle in the camelids.]** *Revue d'Elevage et de Medecine Veterinaire des Pays Tropicaux*. 1968; 21(3): 289-292. Note: In French with English and Spanish summaries.

NAL call no.: 41.8 R3262

Descriptors: gluteal musculature, morphology, disposition of the articularis coxae muscle, Bactrian camel, dromedary, llama.

1967

Chavez, Carlos E.; Universidad Nacional Mayor de San Marcos. Facultad de Medicina Veterinaria. **Environmental Factors Influencing Parasites and Parasitic Diseases of Economical Importance in Ruminants: Cattle, Sheep, Alpacas.** Lima, Peru, University of San Marcos, 1967, 1 v. (various pagings) illus., tables.

NAL call no.: SF810.C5

Descriptors: alpacas, cattle, sheep, parasites, parasitic diseases of economic importance, Peru.

Cozzi, P. **Research on the physical and chemical properties of wool and fleece production of animals raised in tropical and subtropical environment.** *Rivista di Agricoltura Subtropicale e Tropicale*. Jan./Mar. 1967; 61(1/3): 3-10.

NAL call no.: 26 Ag82

Descriptors: alpacas, Latin America, wool and fleece production.

Guerrero, C.A.; Chavez, C.A. **New parasitic nematodes reported in alpacas (*Lama pacos*) from Peru, with a description of *Spiculopteragia peruvianus* n. sp. (Sp.).** *Boletin Chileno de Parasitologia*. Oct./Dec. 1967; 22(4): 147-150. Ref. Note: English summary.

NAL call no.: 436.9 C43

Descriptors: new species, parasitic nematode, taxonomic description.

Hindmarsh, W.L. **The introduction of llamas into New South Wales.** *Australian Veterinary Journal*. Aug. 1967; 43(8): 304.

NAL call no.: 41.8 Au72

Descriptors: llama, history of importation, Australia.

Leupold, J. **[The new world Tylopoda.]** *Deutsche Tierarztliche Wochenschrift*. Aug. 15, 1967; 74(16): 414-417. Ref. Note: In German with an English summary.

NAL call no.: 41.8 D482

Descriptors: New World camels.

1966

Alvarado, J.; Astrom, G.; Heath, G.B.S. **An investigation into remedies of sarna (Sarcoptic mange) of alpacas in Peru.** *Experimental Agriculture*. Oct. 1966; 2(4): 245-254. Ref.

NAL call no.: 10 Ex72

Descriptors: mange, parasites of the skin, *Sarcoptic scabiei*, *Psoroptes communis*.

Young, E. **Chorioptic mange in the alpaca, *Lama pacos*.** *Journal of the South African Veterinary Medical Association*. Dec. 1966; 37(4): 474-475.

NAL call no.: 41.8 So8

Descriptors: mange, skin parasites, *Chorioptes*.

1965

Bonadonna, T. [**The auchenidae of South America.**] *Recueil de Medecine Veterinaire*. Aug. 1965; 141(8): 749-771. Note: In French with an English summary.

NAL call no.: 41.8 R24

Descriptors: camelids, South America, alpacas, vicunas, veterinary medicine.

Murra, J.V. **Herds and herders in the Inca state.** In: Anthony Leeds; Andrew P. Vayda (Editors). *Man, Culture, and Animals; the Role of Animals in Human Ecological Adjustments*. 1965. p. 185-215. Ref.

NAL call no.: 411 L51

Descriptors: alpacas, llamas, rural life, Peru, Incas, herding agricultural systems.

Universidad Nacional Mayor de San Marcos de Lima. Facultad de Medicina Veterinaria. *Parasites and Parasitic Diseases of *Lama pacos* (Alpacas) in Peru* by C.E. Chavez, and C.A. Guerrero. Lima, [Peru]. 1965. 9 p. Ref.

NAL call no.: 436 Un322

Descriptors: alpacas, parasites, parasitic diseases, pathobiology, descriptions of microorganism, Peru.

Vallenas, P.A. **Some physiological aspects of digestion in the alpaca (*Lama pacos*).** *International Symposium on the Physiology of Digestion in the Ruminant*. 2nd, 1964, pub. 1965. p. 147-158. Ref.

NAL call no.: 444.9 In86

Descriptors: physiology, stomach, intestines, digestive process.

1964

Blackburn, D. **Vicuna-the royal fiber.** *Wool Review*. June 1964; 37(518): 29.

NAL call no.: 45.8 W886

Descriptors: wool, use in royal garments, Incas, South America.

Hugh-Jones, M.E., Bacon, A.J. **The "Augenidos" of South America.** *The Veterinarian* (Oxford). Sept. 1964; 2(3): 251-255. Note: Part III b of the *Report of the Cambridge Trans-American Expedition, 1960-61*.

NAL call no.: 41.8 V6467

Descriptors: llama family in South America, camelids.

Nachtigall, H. **Woker stammt das Nomadentum? Kulturgeschichtliche Probleme des indianischen Viehzuchtertums. [What is the origin of nomadism? Problems in the history of civilization on the state of Indian animal husbandry.]** *Die Umschau*. Jan. 15, 1964; 64(2): 47-50, map. Ref. Note: In German.

NAL Call no: 474 Um7

Descriptors: llamas, alpacas, South America, herding, nomads, historical analysis, animal care and husbandry.

Wagenaar, G. [*Sarcoptic scabiei* in a llama.] *Tijdschrift voor Diergeneeskunde*. [Netherlands Journal of Veterinary Science.] May 1, 1964; 89(9): 623-624. Note: In Dutch.

NAL call no.: 41.8 T431

Descriptors: mange, *Sarcoptes*, parasitic mites, skin infection.

Wood, S. **The production of alpaca.** *Wool Review*. Oct. 1964; 38(522): 31.

NAL call no.: 45.8 W886

Descriptors: wool production, care, shearing, trade, Europe, alpaca, Peru.

1962

San Martin, M.; Vega, E. de la; Gonzalez, S.C. **Actividad mitogenica y estadios precoces de la oogenesis en el ovario de alpacas.** [Mitogenic activity and early stages of oogenesis in the ovary of the alpaca; possible primary or secondary effects of gonadotropins.] *Universidad Nacional Mayor de San Marcos. Facultad de Medicina Veterinaria Revista*. 1960, pub. 1962; 15: 7-20. Ref. Note: In Spanish with Spanish and English summaries.

NAL call no.: 41.9 Un37

Descriptors: egg development, ovaries, hormonal effects, gonadotropins, year old animal, polyoocytic primary follicles.

1961

Fallet, M. **Vergleichende Untersuchungen zur Wollbildung Sudamerikanischer Tylopoden.** [Comparative research into wool makin of South American Tylopods.] *Zeitschrift fur Tierzuchtung und Zuchtungsbiologie*. [Journal of Animal Breeding and Genetics]. Jan. 1961; 75(1): 34-56. Ref. Note: In German with an English summary.

NAL call no.: 442.8 Z35

Descriptors: wool, guanaco, South American camelids.

1960

Acosta Rodriguez, L. **Induccion del crecimiento folicular y de la ovulacion en alpacas juvenes.** [Beginning of follicular growth and of ovulation in young female alpacas.] *Veterinaria y Zootecnia*. Mar./Apr. 1960; 12(32): 10. Note: In Spanish.

NAL call no.: 41.8 V6434

Descriptors: young animals, female development, follicules, ovulation.

Chaman Silva Santisteban, E. **Imagen citologica vaginal antes y despues de ovulacion en las alpacas en celo.** [Images of the cellular changes of the vagina before and after ovulation of alpacas in heat.] *Veterinaria y Zootecnia*. Mar./Apr. 1960; 12(32): 13. Note: In Spanish.

NAL call no.: 41.8 V6434

Descriptors: mature female alpacas, reproduction changes, vaginal cellular structural images, affects of ovulation, receptive animals.

Moro, S. **Fiebre de las alpacas o estreptococosis.** [Fever in alpacas or streptocosis.] *Universidad Nacional Mayor de San Marcos. Facultad de Medicina Veterinaria Revista*. 958/59, pub. 1960; 13/14: 7-25. Ref. 1 Note: In Spanish with an Spanish and English summary.

NAL call no.: 41.9 Un37

Descriptors: *Streptococcus* infection, bacterial disease, pathogenesis.

1959

Rodriguez Arce, R. **Ovulacion en las alpacas. [Ovulation in alpacas.]** *Veterinaria y Zootecnia*. Apr. 1959; 11(28): 17.

Note: In Spanish.

NAL call no.: 41.8 V6434

Descriptors: reproduction, female animals, ovulation physiology, hormones.

1958

Pena Sosa, A. **Camelidos sur-Americanos: una fauna util que desaparece. [The camelids of South America: An animal that is disappearing.]** *El Agricultor Venezolano*. Apr. 1958; 21(199): 20-21.

NAL call no.: 9.95 Ag8

Descriptors: *Lama*, llama, alpacas, vicunas, guanacos, natural resource, South America.

Zuniga, Q.J. **El celo en las alpacas. [Heat in alpacas.]** *Veterinaria y Zootecnia*. July 18, 1958; 10(25): Note: In Spanish.

NAL call no.: 41.8 V6434

Descriptors: reproduction, female animals, description, physiology, behavior.

1957

Moro S.M. **Casos clinicos observados en alpacas. [Clinical cases observed in alpacas.]** *Veterinaria y Zootecnia*. June 1957; 9(21/22): 15-19. Note: In Spanish.

NAL call no.: 41.8 V6434

Descriptors: clinical care, veterinary care, case studies.

Moro Sommo, M. **Informe sobre los estudios realizados en las alpacas. [Report about studies made on alpacas.]** *Boletin de la Direccion de Ganaderia. Ganaderia*. Lima, Peru Aug. 1957; 16/17: 3-88. Ref. Note: In Spanish.

NAL call no.: 49.9 P433

Descriptors: diseases, reports, case studies, alpacas.

Vallenas Pantogozo, A. **Algunos estudios sobre la fisiologia de la alpaca. [Some studies about the physiology of the alpaca.]** Lima, Peru. *Boletin de la Direccion de Ganaderia. Ganaderia [Bulletin of the Department of Livestock (cattle) Raising. Livestock Raising.]* Aug. 1957; 16/17: 90-116. Ref. Note: In Spanish.

NAL call no.: 49.9 P433

Descriptors: glycemia, physiology.

1956

Chivilchez Chavez, J. **Estudio biometrico y estructural de la lana de los aquenidos (alpaca, llama y vicuna). [Study the size and structure of the wool of the camelids-alpaca, llama, vicuna.]** *Direccion General de Ganaderia. Patronato de Biologia Animal. Revista*. Spain. Oct./Dec. 1956; 2(4): 355-421. Ref.

NAL call no.: 49.9 Sp16

Descriptors: wool, biometrics, structure.

Moro, S.M. **Contribucion al estudio de las enfermedades de los aquenidos. [Contribution to the study of the diseases of the llama family.]** *Universidad Nacional Mayor de San Marcos. Facultad de Medicina Veterinaria Revista*. Dec. 1956; 7/11: 5-16. Note: In Spanish with an English summary.

NAL call no.: 41.9 Un37

Descriptors: alpacas, diseases, survey, types.

Moro, S.M. **Contribucion al estudio de la leche de las alpacas. [Study of alpaca milk.]** *Universidad Nacional Mayor de San Marcos. Facultad de Medicina Veterinaria Revista*. Dec. 1956; 7/11: 117-141. Note: In Spanish with an English summary.

NAL call no.: 41.9 Un37

Descriptors: alpaca milk, composition.

Vallenos P.A. **Algunas constantes fisiologicas en alpacas. [Some physiological constants in alpacas.]** *Universidad Nacional Mayor de San Marcos. Facultad de Medicina Veterinaria Revista*. Dec. 1956; 7/11: 157-171. Note: In Spanish with an English summary.

NAL call no.: 41.9 Un37

Descriptors: physiology, constants, blood, other organs.

1955

Chivilchez Chavez, J. **La ganaderia en Peru: los aquenidos. [Livestock in Peru: the llama family.]** *Granja*, Madrid, Spain. Feb. 1955; 3(26): 39-40.

NAL call no.: 15 G762

Descriptors: alpacas, vicunas, llamas, characteristics, uses, habitat.

Kraft, H. **Geburt eines Lamas und eklampsie des neugeborenen. [Birth of a llama and eclampsia of the newborn.]** *Berliner und Munchener Tierarztliche Wochenschrift*. July 1, 1955; 68: 228-229. Note: In German with an English summary.

NAL call no.: 41.8 B45

Descriptors: crias, clonic convulsions, *Eclampsia infantum*, calcium and vitamin D treatment.

1954

Appleby, E.C.; Head, K.W. **A case of suspected Johne's disease in a llama (*L. glama*).** *Journal of Comparative Pathology*. Jan. 1954; 64: 52-53.

NAL call no.: 41.8 J82

Descriptors: Johne's disease, *Mycobacterium avium paratuberculosis*, case study.

Arnao de McGregor, M. **Sobre la identificacion de las especies Parasitas en *Lama glama pacos* (alpaca). [The identification of a species of parasites in the llama family.]** *Boletin de la Direccion de Ganaderia. Ganaderia*. Lima, Peru. Jan. 1954; 11: 78-80. Note: In Spanish.

NAL call no.: 49.9 P433

Descriptors: protozoans, cestodes, fluke, various nematodes, mites, insects, *Eimeria*, *Fasciola*, *Moniezia*, *Microtheracius*, *Bovicola*, Peru.

Baracco, A. **Los resultados obtenidos en la explotacion de los auquenidos. [The results obtained in the use of the llama family of animals.]** *Boletin de la Direccion de Ganaderia. Ganaderia*. Lima, Peru. Jan. 1954; 11: 18-23. Note: In Spanish.

NAL call no.: 49.9 P433

Descriptors: care and use, Peru.

Cuba Caparo, A.; Copaira, M.; Ega, E. de la. **Comparative study of the lesions produced by "animal *Streptococcus piogenes*" in the alpaca and goat.** (Sum.) *Pan-American Veterinary Congress Proceedings*. 1954; 2: 210. Note: In English.

NAL call no.: 41.9 C7626

Descriptors: *Streptococcus* infection, alpaca, goat, lesions, comparative study.

Santolalla, N.R. **El fomento en la crianza de la vicuna en domesticidad. [The Development of domestication of the vicuna.]** *Mensajero Agricola*. Sept. 1954; 97: 5-7.

NAL call no.: 9.8 M52

Descriptors: natural resources, domestication of the vicuna, history.

1953

Bautista Iturrizaga, D. **Enfermedad o fiebre de las alpacas. [Diseases or fever in alpacas.]** *Revista del Instituto Nacional de Biología Animal* (Peru). Dec. 1953; 4(6/7): 27-31. Note: In Spanish with an English summary, p. 124-125.
NAL call no.: 442.9 L62R
Descriptors: diseases, alpacas, Peru.

Preston Smith, H. **Fiebre de las alpacas. [Fever in alpacas.]** *Revista del Instituto Nacional de Biología Animal* (Peru). Dec. 1953; 3(4/5): 91-95. Note: In Spanish.
NAL call no.: 442.9 L62R
Descriptors: fever, disease, alpacas, *Streptococcus zooepidemicus*, Peru.

1952

Godoy, J.C. **Glosas históricas sobre los camelidos andinos. [Historical comments about the camel family.]** *La Res.* Jan. 20, 1952; 22: 26755-26756. Note: In Spanish.
NAL call no.: 286.85 R31
Descriptors: alpacas, llamas, history.

1951

Vega D., E. de la. **Aspectos histológicos del aparato digestivo y sistema urogenital de la alpaca. [Histology of the digestive organs and urogenital system the alpaca.]** *Universidad Nacional Mayor de San Marcos. Facultad de Medicina Veterinaria Revista*. Dec. 1951; 6: 145-170. Note: In Spanish.
NAL call no.: 41.9 Un37
Descriptors: histology, stomach, intestines, urogenitals, alpacas.

1950

Bellido Nunez, J. **Estudio comparativo de los caracteres físicos de las lanas y de las producciones pilíferas de los camelidos americanos: alpacas. [Comparative study of the physical characters of the wool and wool products from the American camelids: alpacas.]** *Boletín de la Dirección de Ganadería. Ganadería*. Lima, Peru. May 1950; 3(7): 66-77. Note: In Spanish.
NAL call no.: 49.9 P433
Descriptors: wool fibers, alpacas, comparative study, physical description of fibers, Peru.

Cuba Caparo, A. **Algunas observaciones en la llamada "Fiebre de las Alpacas." [Some observations in the named "Fever of the Alpacas."]** *Boletín de la Dirección de Ganadería. Ganadería*. Lima, Peru. May 1950; 3(7): 14-19. Note: In Spanish.
NAL call no.: 49.9 P433
Descriptors: alpaca diseases, Peru.

Hodge, W.H. **Golden fleece of the Andes.** *Natural History*. May 1950; 59: 200-207.
NAL call no.: 500 N483J
Descriptors: vicuna, the wonderful wool fiber, Andes mountains, South America.

Hodge, W.H. **Llamas: New World beasts of burden.** *The Westralian Farmers' Gazette*. June 1950; 18: 389-392.
NAL call no.: 280.28 W522
Descriptors: llamas, uses, livestock animals, draft animals.

1949

Arnao, M.; Gonzalez, E.; Arbaiza, E. **Parasitos en *Lama glama pacos* o alpaca. [Parasites in *Lama glama pacos* or alpaca.]** *Universidad Nacional Mayor de San Marcos. Facultad de Medicina Veterinaria Revista*. Nov. 1949; 4: 64-65.

Note: In Spanish.

NAL call no.: 41.9 Un37

Descriptors: parasitic organisms, diseases, alpaca.

Copaira, M.A. **Estudios hematologicos en auquenidos. [Studies on the blood of the alpaca family.]** *Universidad Nacional Mayor de San Marcos. Facultad de Medicina Veterinaria Revista*. Nov. 1949; 4: 73-85. Note: In Spanish.

NAL call no.: 41.9 Un37

Descriptors: alpacas, vicunas, blood composition, blood cells, blood components.

Santivanez Morales, J.; Moro Somo, M. **Germen es aislados de alpacas. [Isolated pathogens in alpacas.]** *Universidad Nacional Mayor de San Marcos. Facultad de Medicina Veterinaria Revista*. Nov. 1949; 4: 56-57. Note: In Spanish.

NAL call no.: 41.9 Un37

Descriptors: pathogenic organisms, alpacas, veterinary medicine.

1948

Godoy, J.C. **Glosas historicas sobre los camelidos andinos. [Historical comments on the Andean camelids.]** *Campo y Suelo Argentino*. Nov. 1948; 32(385): 64-65, 69.

NAL call no.: 9 C15

Descriptors: South American camelids, historical notes, alpacas, vicunas.

Rath, E. **Enfermedades de los auquenidos. [Diseases of the *Lama* family.]** Peru. *Direccion de Ganaderia. e Indus. Pecuarias. Ganaderia*. Mar. 1948; 2(4): 51-53. Note: In Spanish.

NAL call no.: 49.9 P433

Descriptors: alpacas, llamas, diseases, *Lama* species.

Toledo Lazo, A.; San Martin, M. **Alpacas y vicunas y su plan de Mejoramiento. [Alpacas and vicunas and the plan for breed improvement.]** *Lanares y Lan as*. July/Sept. 1948; 3(12): 19. Note: In Spanish.

NAL call no.: 45.8 L22

Descriptors: breed improvement plan, alpacas, vicunas.

1947

Benjamin, J. **Breve resena historica y descriptiva de los auchenidos. [A brief historic account and description of the llama.]** *Campo*. La Paz, Peru. July 1947; 1(3): 25-33.

NAL call no.: 9.1 C15

Descriptors: history, llamas, description, natural history.

Lewis, C. **O velocino de ouro dos Andes. [The golden fleece of the Andes.]** *A Fazenda*. Dec. 1947; 42(12): 30-31, 56. Note: In Portuguese.

NAL call no.: 6 H11P

Descriptors: llamas, alpacas, vicunas, fleece, economic value, Andes mountains, South America.

Preston, H. **La enfermedad de las alpacas. [The diseases of alpacas.]** *Lanares y Lan as*. Jan./Mar. 1947; 2(6): 14-16. Note: In Spanish.

NAL call no.: 45.8 L22

Descriptors: diseases, alpacas.

Toledo, A. **La granja de auquenidos. [The farm of alpacas.]** Lima, Peru. *Boletin de la Direccion de Ganaderia*. June 1947; 1(1): 10-14. Note: In Spanish.

NAL call no.: 49.9 P433

Descriptors: alpaca raising, Peru.

Santolalla, N.R. **Hacia la vicuna domesticada, por la pacovicuna.** [From the domesticated vicuna through the pacovicuna.] *Lanares y Lanas*. Oct./Dec. 1947; 3(9): 22.

NAL call no.: 45.8 L22

Descriptors: domestication from wild species, history, South America.

1946

Fryckberg, M. **Gifts of the Americas: the vicuna.** *Agriculture in the Americas*. June/July 1946; 6: 111.

NAL call no.: 1 F752A

Descriptors: wool obtained, value of the fiber, vicuna.

1945

Anonymous. **Alpacas and other queer beasts.** *Scottish Woollens* (Edinburgh, Scotland). 1945; no. 34, 4 p.

NAL call no.: 304.8 Sco8

Descriptors: wool bearing animals, alpacas.

Anonymous. **The breeding of alpacas.** *Bolivia*. May/June 1945; 11(23): 15-20.

NAL call no.: 286.8 B633

Descriptors: general characteristics, husbandry, breeding, care, South America.

Cuello Freyre, J.A. **La llama, preponderante factor economico y social de la America indigena.** [The llama; a predominant social and economic factor in indigenous America.] *Chacra & Campo Moderno*. Dec. 1945. 16(182): 74-75. Note: In Spanish.

NAL call no.: 9 C34

Descriptors: South American, role of the llama, value, social importance.

Whitford, A.C. **The South American cameloids.** *Textile Age*. Sept. 1945; 9(9): 80, 82, 84, 86-87. Note: Third of a series on animal fibers.

NAL call no.: 304.8 T3132

Descriptors: llamas, alpacas, vicunas, guanacos, taxonomic relationships, habitat, characteristic, colors, fibers, South America.

1944

Gallegos P.J. **Explotacion de auguenidos en el Peru.** [Exploitation of llamas and vicuna in Peru.] Direccion de Ganaderia, Ministerio de Agricultura, Chuquibemilla. 1944. 36 p. Note: Issued by Granja Modelo de Puno. In Spanish.

NAL call no.: 412.7 P96

Descriptors: llamas, vicunas, uses, native peoples, Peru.

Savage, W.N. **Rebellious llama.** *Our Dumb Animals*. June 1944; 77: 105.

NAL call no.: 48.8 Ou7

Descriptors: llamas, characterization, behavior.

1943

Falbo, F.L G.; Elias, R.G. **Camelidos Americanos.** [American camelids.] *Suelo Argentino*. Nov. 1943; 2: 372-373 [i.e. 872-873]. Note: In Spanish.

NAL call no.: 9 Su2

Descriptors: llamas, South America.

Preston, H. **La enfermedad de las alpacas.** [The diseases of alpacas.] *Peru. Direccion de Ganaderia. Ganaderia. Inform.* Lima, Peru. 1943; no. 1. 9 p. Note: In Spanish.

NAL call no.: 49.9 P43I

Descriptors: illness, disease, pathogens, alpacas, Peru.

Preston, Harry. **La sarna de las alpacas, "condor ccaracha," "Auma usa."** [Scabies in alpacas, ???] *Peru. Direccion de Ganaderia. Ganaderia. B. de Vulgarizacion.* Lima, [Peru]. 1943; no. 6. 8 p.

NAL call no.: 49.9 P43

Descriptors: *Sarcoptes scabiei aucheniae*, mange, Peru.

Selected Web Resources

Most of the sites below contain general information about these animals. The sites may include information about history, care, behavior, fiber, breeders, and where to obtain supplies. They are usually well illustrated with photographs of the animals.

Camelids

<http://www.omafra.gov.on.ca/english/livestock/alternat/camelids.htm>

If you are interested in accessing more veterinary care and science based information, click on this site and follow the many links to various universities both in Canada and the United States. The site is managed by the Canadian Ministry of Agriculture, Food and Rural Affairs.

<http://www.ultimateungulate.com/>

The Ultimate Ungulate homepage has general information and descriptions about these animals. It is a guide to the world's hoofed mammal species.

<http://animaldiversity.ummz.umich.edu/chordata/mammalia/artiodactyla/camelidae.html>

Camelidae, University of Michigan.

Llamas

<http://www.llama.org/>

Provided by the Llama Lifestyle Marketing Association.

<http://www.llamapaedia.com/index.html>

Includes general information on anatomy, behavior, fiber quality, care, feeding, nutrition, reproduction, etc.

<http://www.nhlama.org/>

There is a lot of basic information here. The New Hampshire Llama Association is interested in educating the public and potential owners about these animals.

<http://www.fao.org/ag/magazine/0108sp.htm>

About Camels and Llamas - Agriculture 21 Magazine article, Food and Agriculture Organization of the United Nations.

Alpacas

<http://www.alpacainfo.com>

Contains information on how to get started as an alpaca owner, a calendar of events related to alpacas, breeder listing, breeding registry, and a lending library of books on the topic. It is maintained by the Alpaca Owners & Breeders Association.

Vicunas

<http://www.bonnydoonalpacas.org/vicunas.html>

Contains very brief information about vicunas with some photographs.

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The Animal Welfare Information Center, <http://awic.nal.usda.gov/contact-us>

<http://www.nal.usda.gov/awic/pubs/llama.htm>

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