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*Animal Welfare
Information Center*

Information Resources on the Care and Welfare of Horses

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Forward

This information resource came to fruition through the diligence of a student employee at the Animal Welfare Information Center. The document contains a comprehensive bibliography and extensive selection of web site resources. Two papers introducing horse care and welfare issues are also included. Dr. C. Stull of the University of California at Davis presents an overview of equine issues in the United States and Dr. D. Mills of the University of Lincoln gives an introduction to worldwide equine ethics and concerns.

Horse welfare issues are coming increasingly to the forefront of animal issues. An economic impact study conducted by Deloitte Consulting LLP for the American Horse Council Foundation in 2005 indicated that there are over 9.2 million horses in the United States with over 4.6 million people involved as horse owners, service providers, employees and volunteers. Over the past few years, the US Congress has discussed bills related to the transportation and slaughter of horses as well as the sale of wild free-roaming horses and burros. Additionally, concerns over the production of pregnant mare's urine for hormone replacement therapy (PMU ranching) led to the establishment of groups who placed animals in new homes after ranches were closed. For an overview of the equine ranching industry, see the article *PMU Ranching Demonstrates Benefits of Self-Regulation* by Norman Luba in the *Animal Welfare Information Center Bulletin* Vol 10., No. 1-2 (1999).

In the United States, the federal Horse Protection Act was first passed in 1972 in order to prohibit painful soring practices and continues to be enforced today. Under the Animal Welfare Act, only horses used in biomedical research, teaching or testing are regulated. The Animal Legal and Historical Center at the Michigan State University College of Law provides a list of federal and state horse related statutes in the United States. Worldwide, many countries perceive horses as pets rather than farm animals. In the United Kingdom (UK), DEFRA provides a gateway to horse issues in government, including links to information on health, breeding, and passports for travel. An overview of international anti-cruelty laws is also provided by the Animal Legal and Historical Center at the Michigan State University College of Law.

This document will continue to evolve as new research is conducted and published. It is hoped that this information resource is a starting point for all people who care and work with horses.

About this Document

This publication updates and expands AWIC's ***Housing, Husbandry and Welfare of Horses, 1994***. The bibliographic chapters are divided into subject areas that cover anesthesia and analgesia, behavior, environmental enrichment, housing, law and legislation, nutrition and feeding, pasture, equine ranching,

safety , training and transportation. Citations included in these chapters were published between 1994 and December 2006 and selected from searches conducted using a variety of agricultural, medical and life science databases. In each chapter, the citations are arranged alphabetically according to the last name of the primary author. Web sites specific to each topic area are included at the end of the chapters.

Each citation in the bibliographies contains descriptor terms, an abstract when available, and the NAL call number if the particular source is available at the National Agricultural Library (NAL). Visit the NAL web site for information on how to request library materials.

Readers are cautioned as to the dynamic nature of the internet and the fact that web addresses and content are subject to change. All sites are current as of April 2008.

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<http://www.nal.usda.gov/awic/pubs/horses/horses.htm>

April 24, 2008



Horse Welfare

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The scientific assessment of equine welfare has grown markedly over the last decade, but welfare assessment is not an easy task as it is by its very nature multidisciplinary. It is therefore timely for a review of available resources to help all of us interested in improving horse welfare. It is particularly important as there is still no complete consensus on what “welfare” really is, even among welfare scientists. Some will emphasise the importance of health, others, feelings and yet others the ability for an animal to fulfil its natural potential. For some, the feelings of an individual at a given time should be referred to as its well-being, with welfare considering not just the animal’s current feelings but also the threats to its well-being. Thus it might be argued that horses whose work puts them at risk of particular injury, such as limb injury in race horses, have worse welfare than those whose work does not pose such risks. This approach can be useful when considering welfare within the context of populations, but it is important not to forget the individual. Even if the risk is 1 in 10000 for a catastrophic injury, the consequences for that one individual that is injured are disastrous. Some also consider the effort required by an animal to maintain its state of well-being. Thus Broom (1986) defines welfare as the state of an animal with regards to its attempts to cope with its environment. This would imply that a horse kept in an optimal ambient temperature may be thought to have better welfare than one who must devote additional resources to the maintenance of such a temperature. It is therefore important to clarify what an individual means by the term “welfare” especially when one animal’s welfare is said to be better for another.

However, a publication like this makes no judgement and allows individuals and groups to access the latest information they need for their purposes. It is sad truth that well-meaning intentions do not always translate into well-being of our charges, and horses are particularly a victim of this. Being kept in quarters that look comfortable to carers may not be most appropriate for horses, who have strong social tendencies and a physiology and psychology adapted to a life feeding on open grasslands.

A common criticism of those seeking to assess animal welfare objectively is that we cannot know the mind of another; but this criticism reflects a failure to understand the fundamental principles of the scientific method. Science makes progress through hypotheses which can be tested but which can never be shown to be completely true. In this respect welfare is no different to any other scientific pursuit. All scientific evidence carries with it a degree of uncertainty and we decide what level we are prepared to accept (often a 5% chance level). However these principles are often forgotten by sceptics who, for whatever reason, appear not to want to contemplate what might be happening in the minds of other animals. There is a need for those interested in animal welfare to make clear and defend the scientific basis of their work in order to propose what is possible, realistic and reasonably justifiable.

There are many reasons to be interested in horse welfare. From an ethical perspective it might be argued that we have a responsibility to minimise the suffering we cause to other animals with whom we interact either directly or indirectly. From a practical point of view, animals with good welfare might be expected to perform their work more efficiently. From an academic perspective the assessment of animal welfare is also a challenging intellectual task. However, it is not the aim of this publication to argue why we should measure horse welfare or the ethics of what we do to horses, rather it is hoped that to bring together information to help increase awareness of the methods at our disposal for the

assessment and management of the welfare of the horse in a broad range of contexts.

A practical problem for advances in equine welfare concerns the need for funding in this field. Horses are expensive animals to keep and study; and although they are of enormous economic importance, the industry is fragmented and often poorly represented to governments and other funding bodies as a significant concern, except perhaps for the case of the equine athlete. The welfare research field has largely been driven by concern over whether what we do to animals is acceptable and not purely by the intellectual issues involved. As a result research funding has focussed on political priorities. Thus a large proportion of equine welfare research focuses on the problems faced at the extremes of athletic performance, which is largely irrelevant to the vast majority of equids.

More broadly the scientific study of animal welfare has invested enormously in how to assess suffering so that it can be minimised, rather than the evaluation of well-being and positive mental states, which is perhaps the goal of the average carer. Trying to measure “happiness” is not only an enormous intellectual challenge, but also a completely alien concept to many funding bodies and so generally given very little attention despite its central importance to those interested in animal welfare. Scientists also vary in the subjective feelings they are willing to ascribe to a horse (see Price et al., 2002, for an illustration of attitude amongst U.K. veterinary surgeons), and so this field is likely to remain a contentious area of research. Politically speaking laboratory and farm animal welfare have been major areas of concern and so they have been the focus for funding with little money being available to those interested in the well-being of companion animals including the horse. This does not mean that there are any fewer problems in these species, just that they are largely overlooked by both the public and funding bodies. For these reasons there are significant gaps in our scientific knowledge of horse welfare, but we are able to recognise rational approaches to its scientific study. This publication helps to identify what we know and what can be applied, but will also identify the gaps in our knowledge.

Horses have evolved to be adapted to their natural environment and so if the behaviour of a horse resembles this natural state then it might be thought that it is normal and suffering minimal. However, the occurrence of normal behaviour patterns does not necessarily imply good welfare. Some normal behaviours are clearly associated with aversion, such as flight from a predator and so their occurrence is undesirable. In other instances the significance of the behaviour depends on the context. For example, horses may move into water away from dry land in order to avoid the effects of blood-sucking insects which can cause anaemia. Whilst this is obviously beneficial to the horse, this behaviour is not without its costs. They may reduce grazing or reduce other important behaviours as a trade off for escaping the insects. So, whilst standing idle or engaging in social exchanges with others does not appear to be a behaviour of concern, in this case the horses would undoubtedly be better off doing something else if the insects were absent

Some of the adaptations horses have evolved to help them to cope with the challenges they encounter in their natural environment are sufficient to protect them when faced with challenges unique to the domestic environment, but in other cases the horse may not be able to adapt adequately, in which case there must be concern for the animal's welfare. The problem is identifying when these natural systems are being over-taxed. Behaviour is a form of adaptation to the environment and so its evaluation is dependent upon context. It is important not to make unjustified generalisations. Two horses in different environments might be expected to show different behaviours as well as different patterns of behaviour as part of their healthy adaptation to the different environments. So there may be no norm against which the behaviour of a captive animal can be meaningfully compared. Individuals should avoid the temptation to make arbitrary comparisons when it suits their case, for example the amount of time a horse should spend grazing or alert in a day to be normal or psychological healthy. There is no logic in the assumption that quantitative or qualitative differences in behaviour necessarily imply a difference in welfare. Instead it is important to appreciate the function and regulation of each behaviour in the context in which it occurs, and look for other evidence of the welfare status of the individual. Understanding the natural behaviour of horses is important to the scientific study of equine welfare as it is through this we can appreciate the functional significance of a given behaviour and the mechanisms which may underlie the adaptability of the horse and when these may be strained in an unnatural setting, for example concentrate feeding or the use of raised hay nets.

When trying to evaluate the risks of a given horse management system, we might use one of two approaches and the information in this publication is useful to both processes. We might consider what is within the system which might potentially compromise the welfare of the animal or what signs come out of the system. The former are indirect indicators of areas of potential focus while the latter are more direct measures of what is happening in practice. In both

cases the horse, its management and its environment make up the system of interest. Indirect measures can be useful as they can flag up areas of potential concern or interest, for example consider a horse being kept in a livery yard versus one being kept for racing or PMU production. They have different demands put upon them, might be kept in quite different environments by people of differing level of skill in welfare monitoring. One system might be considered lower risk than another, but that does not mean that the welfare is necessarily safe nor the opposite true in a higher risk system, but it does allow prioritisation of concern. The information on the effects of different types of procedures (management, training, veterinary or otherwise), within this particular publication is therefore particularly useful in this regard. The welfare can only be reasonably determined by looking at the direct measures (outputs) of the system, which relate to the behaviour and physiology of the horses and again this publication will help in the evaluation of these measures.

Pain is often the primary concern of most carers and is defined as: “An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” (IASP, 1979). The recognition of pain has received most scientific study, perhaps because of the historical importance of the veterinary profession in the study of animal welfare and its obvious association with physical lesions. A variety of techniques have been proposed in the scientific literature for the assessment of pain in the horse based on behavioural and physiological measures e.g. the assessment of activity budgets pre and post surgery (Price et al., 2003), response to analgesia (Dyson 2002), and median frequency within electro-encephalogram recordings (Murrell et al., 2003), but these are generally restricted to use within a specific context. More general measures, such as indicators of sympathetic nervous system activity tend to be non-specific to suffering, unvalidated and / or contradictory. Nonetheless, the ethology of pain is probably worthy of further attention.

It is also important to appreciate that pain is probably not the only aversive feeling experienced by horses. Dawkins (1990) argues that suffering consists of a “a wide range of emotional states that occur when an animal is blocked from carrying out actions that are biologically mandated, normally reduce harm or risk to life or concern reproduction.” This stance has spawned a wealth of work designed to assess the needs of animals in order to determine which are biologically mandated. Simple preference tests may tell us what an animal prefers but they do not tell us if an animal is suffering if it is deprived of the preferred choice. I may prefer Bordeaux wines to Champagnes but I can be happy with either! So scientists have developed techniques where they have started to look at the price an animal is willing to pay for a given commodity. In this way we can have a clearer idea of what is really important to an animal. However, whilst there is nothing to theoretically stop such work being done in the horse, the cost of building the experimental apparatus and housing the number of animals necessary for the time required to obtain sound data has to date largely prevented such work in the horse; although Houpt’s group at Cornell (Lee et al 2001) has conducted preliminary studies to assess the strength of a horse’s motivation for exercise and companionship when confined for 23 hours in the day. A higher price was paid for companionship over exercise and this reinforces much work by our own group which suggests that social isolation is one of the primary problems with many modern housing systems (see Mills and Clarke, 2002 for a review). There is undoubtedly a need for more work in this field and we can only hope that those who have the potential to fund it recognise its importance so we can objectively assess the welfare of the horse in a variety of contexts.

In short this publication is an essential resource for all those who work both directly and indirectly with horses.

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Equine Welfare Issues in the United States: An Introduction

by Carolyn L. Stull, PhD

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Horses are found on every continent in the world; perhaps this is an indication of the enormous utilitarian value which this versatile species has given to societies throughout the world. As these societies developed in different ways, it was perhaps inevitable that differing views of how horses should be treated also developed. Over the centuries, people of diverse cultural and ethnic origins have settled in the United States and have utilized horses for transportation, food, draft power, sport, pleasure, and companionship. The history of equine welfare and legislation in the U.S. is a reflection of the traditional views and background of its diverse society.

The U.S. was the first country in the world to provide legal protection of farm animals, which included the horse. In 1641, the Massachusetts Bay colony drafted a law which forbade cruelty to farm animals, including horses. In another Liberty, it was stated that rest, feed, and water should be provided to animals led, driven or ridden. States have historically addressed differing equine welfare issues through legislation. For example, California's statute of 1905 forbade the docking of horses' tails, which was defined as the removal of the lower portion of the tail for the purposes of shortening it. The docking of tails was primarily practiced on driving horses to prevent the entanglement of the tail with the driving lines. However, it remains today to be a prohibited practice in California, but not in other neighboring states. A variety of state legislation has been enacted over the years and currently enforces activities such as the prohibition of the poling of jumping horses, the misuse of specific medications in sport horses, and the elimination of some rodeo events in both traditional and Mexican-style rodeos.

Horses pulling wagons, carts coaches and city streetcars were used for transportation in the early nineteenth century. New York City was especially overcrowded with carriages, and the first horse drawn street railway was developed in 1932. These streetcars often were packed with too many passengers, and horses had to endure slippery, icy and salted streets during the bitter cold winter months. Henry Bergh became concerned about the overcrowding of the streetcars and the filthy housing conditions of these horses. There were numerous newspaper editorials ridiculing Henry Bergh as he stopped these streetcars and refused to allow traffic to continue until excess passengers disembarked. Henry Bergh continued with his crusade against the abuse of horses by developing legislation in the state of New York to charter the American Society for the Prevention of Cruelty to Animals. The Society focused mainly on the abuses of horses, but was also concerned with vivisection, transport of animals, and slaughterhouse conditions. Many branch Societies were established in surrounding towns and cities, and the successful expansion of the mission and goals of the ASPCA to other states was inevitable. Perhaps, Henry Bergh was one of the most influential leaders in addressing the welfare concerns of horses through model law enforcement and educational programs, in addition to founding the ASPCA.

The largest federal program in scope and impact on equine welfare in the last 50 years came with the legislation entitled "Horse Protection Act" of 1970. The Act prohibits the use of irritating or blistering agents, lacerations, or injected substances to the limbs of competitive horses for the purposes of altering its gait. Congress stated in the Act that "soring of horses is cruel and inhumane." The legislation was mainly directed at the high-stepping gait of the Tennessee

Walking Horse breed, but covers all competitive and sales events. The United States Department of Agriculture's (USDA) veterinary medical officers inspect competitive events. Violators can be prosecuted as a felony offense. Identification of violations and the inspection process of the horses has continually undergone revisions since the initiation of the Act; some of these changes were the result of applicable scientific research and technology advances.

Horses in the U.S. have been used to produce meat products for human consumption, with most of the consumption outside its borders. Consumption of horse meat was popular after World War II, especially in Europe where beef was scarce and old or lame horses were processed for affordable meat products. Today, horsemeat is a high-priced meat delicacy in some European countries. Prior to 1979, horses were shipped live to Europe on ocean barges, often with high mortality rates and other unsuitable conditions. This practice is now prohibited (Provision of Export Administration Act) and thus the foreign companies invested in slaughter facilities in countries such as Canada and U.S. where there are large horse populations to supply their customers. Since there were a limited number of these facilities, often horses would have to endure long distances and difficult conditions by road transport to reach a facility. In the early 1990's, there was public concern about the transport and handling conditions of horses to slaughter facilities which prompted the development of federal regulations. Research by several universities was conducted to establish scientific data on different aspects of transport. Using this published data, the USDA Animal Plant and Health Inspection Service established (February, 2002) specific regulations on the safe and humane commercial transportation of equines to slaughter (9 CFR Parts 70 and 88). The regulations cover maximum transit times and prohibit "unfit" horses from being loaded, the use of "pot-belly" trailers after 2006, and the use of electrical prods. Recently, Canada and Mexico have agreed (USDA, Veterinary Services Memorandum 555.18) to perform similar inspections at their slaughter facilities for horses originating in the U.S. to ensure the safe and humane transport of horses internationally.

The predominate role of horses in the U.S. has progressed over the last century from their utilization as livestock, draft or agricultural animals to recreational, sport, or as companion animals. This progression has paralleled the change in cultural values associated with the welfare of horses. Society today expects a similar standard of care for horses that are offered to family pets, such as dogs and cats. Neglected or abused horses are reportable to animal control agencies at the local community level in most areas in the U.S. Animal control and protection service in the U.S. consists of both non-profit and governmental organizations. The limited resources of most animal control agencies are primarily utilized for control of dogs and cats in their community. Their facilities and expertise for horses varies from no services to extensive shelter facilities designed for horses with trained personnel.

Although, most horses are afforded a high standard of care during their lifetime, some horses may experience lack of feed, water or care due to economic restraints, limited knowledge necessary to adequately care for the horse, or the loss of the horse's ability to perform its intended role for the owner (e.g., lameness, old age). Most neglect and abuse cases can be resolved through owner education. However, the care and rehabilitation of the neglected, abused, or unwanted horses can be extensive in resources, funding, and time. Older horses may be limited in their physical abilities or health to be a promising candidate for relocating to another home following rehabilitation. Additionally, neglected horses may pose a disease risk to the general equine population and the public's health by hosting or transmitting diseases. Educational programs using existing resources on subjects such as appropriate housing for climatic conditions, feeding requirements, health, acceptable training methods, manure management, transportation conditions, and humane euthanasia should be developed and accessible to all facets of society. These programs should convey to the owner the responsibilities in caring for horses which are socially acceptable and ensure the welfare of the individual horse.

The future of equine welfare will certainly be reflective of the progression of cultural values in society, the advancements from scientific research, future global trade and health issues, and the continued development of local, state and federal regulations and legislations. The emerging issues may include transportation regulations extended to pleasure and sport horses, minimum exercise requirements for confined horses, permitting equine facilities for environmental, welfare, and safety standards, and the development of feasible long-term venues to care for unwanted or aged horses at the local community level. Informational resources, such as this publication by Animal Welfare Information Center, will be invaluable for protecting or enhancing the welfare of the horse through many venues including the development of extensive educational programs, implementation of progressive or innovative management techniques, or by the enforcement of regulations or legislation.

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Descriptors: horses, anesthesia, analgesics, bupivacaine, meperidinepethidine, epidural administration.

Language of Text: English with a French summary.

Del Castillo, S. and N.S. Matthews (2005). **How to assemble, apply, and use a head-and-tail rope system for the recovery of the equine anesthetic patient.** In: *Proceedings of the 51st Annual Convention of the American Association of Equine Practitioners, December 3, 2005-December 7, 2005, Seattle, Washington, USA*, p. 490-493.

Descriptors: adverse effects, anesthesia, animal welfare, postoperative care, postoperative complications, recovery, trauma, horses.

Dirikolu, L., A.F. Lehner, W. Karpiesiuk, J.D. Harkins, W.E. Woods, W.G. Carter, J. Boyles, M. Fisher, and T. Tobin (2000). **Identification of lidocaine and its metabolites in post-administration equine urine by ELISA and MS/MS.** *Journal of Veterinary Pharmacology and Therapeutics* 23(4): 215-222. ISSN: 0931-184X.

NAL Call Number: 41.8 Z5

Abstract: Lidocaine is a local anesthetic drug that is widely used in equine medicine. It has the advantage of giving good local anesthesia and a longer duration of action than procaine. Although approved for use in horses in training by the American Association of Equine Practitioners (AAEP), lidocaine is also an Association of Racing Commissioners International (ARCI) Class 2 drug and its detection in forensic samples can result in significant penalties. Lidocaine was observed as a monoprotinated ion at m/z 235 by ESI+ MS/MS (electrospray ionization-positive ion mode) analysis. The base peak ion at m/z 86, representing the postulated methylenediethylamino fragment [CH₂N(CH₂CH₃)₂]⁺, was characteristic of lidocaine and 3-hydroxylidocaine in both ESI+ and EI (electron impact-positive ion mode) mass spectrometry. In addition, we identified an ion at m/z 427 as the principal parent ion of the ion at m/z 86, consistent with the presence of a protonated analog of 3-hydroxylidocaine-glucuronide. We also sought to establish post-administration ELISA-based 'detection times' for lidocaine and lidocaine-related compounds in urine following single subcutaneous injections of various doses (10, 40, 400 mg). Our findings suggest relatively long ELISA based 'detection times' for lidocaine following higher doses of this drug.

Descriptors: local anesthetics, lidocaine, detection in racehorses, post-administration ELISA-based detection times, urine samples, drug dosage.

Dujardin, C.L.L., P. Gootjes, and Y. Moens (2005). **Isoflurane measurement error using short wavelength infrared techniques in horses: influence of fresh gas flow and pre-anaesthetic food deprivation.** *Veterinary Anaesthesia and Analgesia* 32(2): 101-106. ISSN: 1467-2987.

Online: <http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=vaa>

Descriptors: horses, anesthesia, isoflurane, measurement error, gas analysis, short wavelength analysis, analytical techniques.

Dumasia, M.C., L. Williams, K. Silverthorne, and E. Houghton (2000). **Detection of the local anaesthetic mepivacaine and its metabolites in equine urine: In vivo biotransformation and urinary excretion after subcutaneous administration.** In: *Proceedings of the 12th International Conference of Racing Analysts and Veterinarians, 1998, Vancouver, British Columbia, Canada*, R & W Publications (Newmarket) Ltd.: Newmarket, UK, p. 219-223.

Descriptors: racing horses, anesthetics, mepivacaine, urine, drug detection, local anesthetics.

Dunlop, C. (1995). **Parenteral anesthesia techniques for intractable horses.** In: *Proceedings from the Annual Convention of the American Association of Equine Practitioners, December 3, 1995-December 6, 1995, Lexington, KY*, American Association of Equine Practitioners: Kentucky, USA, Vol. 41, p. 60-61.

NAL Call Number: SF601.A46

Descriptors: anesthesia, premedication, sedation techniques, stress management, ketamine, xylazine, butorphanol, diazepam, succinylcholine, detomine, morphine, acepromazine.

Dyson, S. (1997). **An approach to hindlimb lameness. 3. Local analgesic techniques.** *In Practice* 19(2): 82-88.

ISSN: 0263-841X.

NAL Call Number: SF601.I4

Descriptors: horses, lameness, diagnosis, pain, analgesics, local anesthesia, nerve blocks.

Edner, A. (2005). *Effects of anaesthesia on haemodynamics and metabolism in horses*. Dissertation, Swedish University of Agricultural Sciences: Uppsala, Sweden. 83 p.

Online: <http://pub.epsilon.slu.se/854/>

Descriptors: horses, anesthesia, musculoskeletal system, post-anaesthetic myopathy, muscle metabolism, microdialysis, laser doppler flowmetry, microdialysis, muscle biopsy.

Notes: Thesis.

Edner, A., B. Essen Gustavsson, and G. Nyman (2005). **Muscle metabolic changes associated with long-term inhalation anaesthesia in the horse analysed by muscle biopsy and microdialysis techniques.** *Journal of Veterinary Medicine Series A* 52(2): 99-107. ISSN: 0931-184X.

NAL Call Number: 41.8 Z5

Descriptors: horses, inhalation anesthesia, effects of anesthesia, muscle metabolism, analysis techniques.

Edner, A., G. Nyman, and B. Essen Gustavsson (2002). **The relationship of muscle perfusion and metabolism with cardiovascular variables before and after detomidine injection during propofol-ketamine anaesthesia in horses.** *Veterinary Anaesthesia and Analgesia* 29(4): 182-199. ISSN: 1467-2987.

Descriptors: horses, anesthesia, cardiovascular variables, muscle perfusion, propofol-ketamine, detomidine, muscular metabolic response, respiratory function.

Notes: Equine Special Issue.

Engeli, E. and K.K. Haussler (2004). **Review of sacroiliac injection techniques.** In: *Proceedings of the 50th Annual Convention of the American Association of Equine Practitioners, December 4, 2004-December 8, 2004, Denver, Colorado, USA*, p. 372-378.

Online: <http://www.aaep.org>

Descriptors: etiology, anesthesia, anesthetics, analgesics, diagnosis, diagnostic techniques, injection, joint diseases, lameness, ligaments, local anesthetics, reviews, spine, horses.

Erkert, R.S., C.G. MacAllister, and M.E. Payton (2005). **Use of force plate analysis to compare the analgesic effects of intravenous administration of phenylbutazone and flunixin meglumine in horses with navicular syndrome.** *American Journal of Veterinary Research* 66(2): 284-288. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, analgesia, pain management, navicular disease, phenylbutazone, flunixin meglumine, analysis techniques.

Estrada U, M. (2000). **Una tecnica de anestesia general intravenosa para equinos: recomendaciones practicas. [An intravenous general anaesthesia technique for equines: practical recommendations].** *Ciencias Veterinarias Heredia* 23(2): 57-63. ISSN: 0250-5640.

Descriptors: horses, anesthesia, anesthetic procedure, acepromazine, anesthesia, anesthetics, chloral hydrate, phenothiazines.

Language of Text: Spanish with an English summary.

Farstvedt, E.G. and D.A. Hendrickson (2005). **Intraoperative pain responses following intraovarian versus mesovarian injection of lidocaine in mares undergoing laparoscopic ovariectomy.** *Journal of the American Veterinary Medical Association* 227(4): 593-596. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Abstract: OBJECTIVE: To compare intraoperative pain responses following intraovarian versus mesovarian injection of lidocaine in mares undergoing laparoscopic ovariectomy. DESIGN: Randomized controlled trial. ANIMALS: 15 mares between 4 and 20 years old. PROCEDURE: Standard bilateral laparoscopic ovariectomy was performed. Prior to manipulation of the ovary, 2% lidocaine (10 mL) was injected into the ovary and saline (0.9% NaCl) solution (10 mL) was injected into the mesovarium on 1 side, with saline solution (10 mL) injected

into the ovary and 2% lidocaine (10 mL) injected into the mesovarium on the other side. Presence (yes vs no) and severity (visual analogue scale) of pain were scored at 5 times (grasping of the ovary, dissection of the mesosalpinx, tightening of the first loop ligature, tightening of the second loop ligature, and transection of the ovarian pedicle) by 2 individuals blinded to treatment and each other's observations. **RESULTS:** During 4 of the 5 observation periods, significantly fewer mares had signs of pain following mesovarian injection of lidocaine, and during 2 of the 5 observation periods, visual analogue scale score was significantly lower. **CONCLUSIONS AND CLINICAL RELEVANCE:** Results suggest that mesovarian injection of lidocaine is associated with significantly lower pain responses, compared with intraovarian injection, in horses undergoing laparoscopic ovariectomy.

Descriptors: local administration and dosage of anesthetics, horses, lidocaine, ovariectomy, pain, intraoperative care, laparoscopy methods, mesovarian injection compared to intraovarian injection of lidocaine.

Fischer, U. (1997). **Möglichkeiten der Injektionsnarkose beim Pferd und Narkoserisiko. [Injection anaesthesia and anaesthesia risks in the horse].** *Praktische Tierarzt* 78(Sonderheft): 42-45. ISSN: 0032-681X.

NAL Call Number: 41.8 P882

Descriptors: horses, anesthesia, anesthetic injection, ketamine, xylazine, guaifenesin, risks.

Language of Text: German with an English summary.

Freeman, S.L. and G.C. England (1999). **Comparison of sedative effects of romifidine following intravenous, intramuscular, and sublingual administration to horses.** *American Journal of Veterinary Research* 60(8): 954-959. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, anesthesia, sedation, romifidine, intravenous administration, intramuscular administration, sublingual administration.

Giguere, S., E. Bucki, D.B. Adin, A. Valverde, A.H. Estrada, and L. Young (2005). **Cardiac output measurement by partial carbon dioxide rebreathing, 2-dimensional echocardiography, and lithium-dilution method in anesthetized neonatal foals.** *Journal of Veterinary Internal Medicine* 19(5): 737-43.

Abstract: The objective of this study was to assess 2 noninvasive methods of measuring cardiac output (CO) in neonatal foals by comparing results to that of the lithium-dilution method. Ten neonatal foals were anesthetized and CO was manipulated by varying the depth of anesthesia and infusion of dobutamine. Concurrent CO measurements were obtained by lithium dilution (reference method), partial carbon dioxide (CO₂) rebreathing, volumetric echocardiography (cubic, Teichholz, Bullet, area-length, and single and biplane modified Simpson formulas), and transthoracic Doppler echocardiography. Thirty pairs of lithium-dilution/noninvasive CO measurements were taken from the 10 foals. For each method, relative bias was calculated as a percentage of the average CO. Lithium determinations of CO ranged between 3.09 and 11.1 L/min (mean +/- SD = 6.39 +/- 2.1 L/min), resulting in cardiac indices ranging between 79.0 and 209 mL/kg/min (mean +/- SD = 131 +/- 35.9 mL/kg/min). Relative bias of Doppler echocardiography significantly increased ($P < .05$), whereas that of partial CO₂ rebreathing significantly decreased ($P = .03$) with increasing CO. Other methods were not influenced by the level of CO. Among methods not influenced by the level of CO, relative bias of the Bullet method (-4.2 +/- 20.9%; limits of agreement -45.2 to 36.7%) was significantly lower ($P < .05$) than that of each of the other noninvasive methods evaluated. Volumetric echocardiography using the Bullet method provides an accurate and noninvasive estimate of CO in anesthetized neonatal foals and warrants investigation in critically ill conscious foals.

Descriptors: anesthesia, neonatal foals, noninvasive cardiac output measurement methods, methodology comparison, lithium dilution, partial carbon dioxide rebreathing, volumetric echocardiography, transthoracic Doppler echocardiography.

Gomez de Segura, I.A., R. de Rossi, M. Santos, J.L. San Roman, F. San Roman, and F.J. Tendillo (1998). **Epidural injection of ketamine for perineal analgesia in the horse.** *Veterinary Surgery* 27(4): 384-391. ISSN: 0161-3499.

NAL Call Number: SF911.V43

Descriptors: horses, conduction anesthesia, perineum, ketamine, evaluation, dosage, blood pressure, blood gases, pain, dosage effects.

- Goodrich, L.R., S. Clark Price, and J. Ludders (2004). **How to attain effective and consistent sedation for standing procedures in the horse using constant rate infusion.** In: *Proceedings of the 50th Annual Convention of the American Association of Equine Practitioners, December 4, 2004-December 8, 2004, Denver, Colorado, USA*, p. 229-232.
Online: <http://www.aaep.org>
Descriptors: analgesics, butorphanol, catheters, detomidine, drug delivery systems, neuroleptics, surgery, syringes, techniques, horses.
- Green, P. (2001). **Castration techniques in the horse.** *In Practice* 23(5): 250-261. ISSN: 0263-841X.
NAL Call Number: SF601.I4
Descriptors: horses, veterinary procedures, castration, postoperative management, complications, surgical equipment, surgical methods.
- Grubb, T.L., P.D. Constable, G.J. Benson, J.H. Foreman, W.O. Olson, J.C. Thurmon, W.J. Tranquilli, and L.E. Davis (1999). **Techniques for evaluation of right ventricular relaxation rate in horses and effects of inhalant anesthetics with and without intravenous administration of calcium gluconate.** *American Journal of Veterinary Research* 60(7): 872-879. ISSN: 0002-9645.
NAL Call Number: 41.8 Am3A
Descriptors: horses, anesthesia, right ventricular relaxation rate, isoflurane, halothane, calcium gluconate, evaluation techniques.
- Haga, H.A., S. Lykkjen, T. Revold, and B. Ranheim (2006). **Effect of intratesticular injection of lidocaine on cardiovascular responses to castration in isoflurane-anesthetized stallions.** *American Journal of Veterinary Research* 67(3): 403-408. ISSN: 0002-9645.
NAL Call Number: 41.8 Am3A
Descriptors: anesthesia, intratesticular administration, lidocaine, cardiovascular system, cremaster muscle tension, castration, inhalation anesthesia.
- Hainisch, E.K. (2001). **Sedation by continuous intravenous detomidine drip for standing surgical procedures.** *Equine Veterinary Education* 13(1): 43-44. ISSN: 0957-7734.
NAL Call Number: SF951.E67
Descriptors: horses, surgical procedures, standing surgery, anesthesia, sedatives, detomidine.
- Heess, D. and A.E. Hartmann (2003). **Zur Injektionsanästhesie beim Pferd. [Injection anaesthesia in the horse].** *Praktische Tierarzt* 84(10): 764-770. ISSN: 0032-681X.
NAL Call Number: 41.8 P882
Descriptors: horses, general anesthesia, xylazine, romifidine, detomidine, muscle relaxants, guaifenesin, ketamine, alpha-2-agonists, foals, propofol, diazepam.
Language of Text: German with an English summary.
- Hendrickson, D.A., L.L. Southwood, M.J. Lopez, R. Johnson, and K.T. Kruse Elliott (1998). **Cranial migration of different volumes of new-methylene blue after caudal epidural injection in the horse.** *Equine Practice* 20(2): 12-14. ISSN: 0162-8941.
NAL Call Number: SF951.E62
Descriptors: horses, caudal epidural anesthesia, epidural injections, anesthesia procedure, injection quantity determination method.
- HongBin, W. and S. Ying (1995). **[Study by impedance cardiogram on the influence of several anaesthesia methods on the cardiac function of horses].** *Scientia Agricultura Sinica* 28(4): 87-93. ISSN: 0578-1752.
NAL Call Number: 22.5 N928
Descriptors: horses, anesthesia techniques, cardiovascular system, electrocardiograms.
Language of Text: Chinese with an English summary.
- HongBin, W. and W.e.a. YunHe (1995). **[Studies on the influence of different anaesthetic methods on the arterial**

blood gases and acid-base status in horses]. *Acta Veterinaria Et Zootechnica Sinica* 26(1): 81-86. ISSN: 0366-6964.

Descriptors: horses, anesthetic techniques, blood chemistry, blood gases, acid base status.

Language of Text: Chinese with an English summary.

Hoyos Sepulveda, M.L., G.W. Brumbaugh, G. Meza Barreto, and H. Sumano Lopez (2001). **Induccion experimental de anestesia general en potros con la administracion intravenosa de isoflurano.** [Experimental induction of general anesthesia in foals with an intravenous administration of isoflurane]. *Veterinaria Mexico* 32(4): 257-263. ISSN: 0301-5092.

NAL Call Number: SF604.V485

Descriptors: horses, foals, general anesthesia, isoflurane, intravenous administration, dosage determination.

Language of Text: Spanish.

Hubbell, J.A.E., K.W. Hinchcliff, L.M. Schmall, W.W. Muir, J.T. Robertson, and R.A. Sams (1998). **Administration of intravenous anesthetics to horses immediately after maximal exercise.** *Proceedings From the Annual Convention of the American Association of Equine Practitioners* 44: 242-243. ISSN: 0065-7182.

NAL Call Number: SF601.A46

Descriptors: injectable anesthetics, anesthesia.

Hussain, S.S. (1995). **Techniques of acupuncture analgesia for equine surgery.** *Centaur Mylapore* 12(1): 8-12.

Descriptors: horses, analgesia, anesthesia, acupuncture, surgical procedures.

Jansson, N., H.V. Sonnichsen, and E. Hansen (1995). **Bone spavin in horse: Fenestration technique. A retrospective study.** *Pferdeheilkunde* 11(2): 97-100. ISSN: 0177-7726.

Descriptors: limb bones, bone spavin, joint diseases, Fenestration technique, anesthesia, musculoskeletal system, surgery, horses.

Language of Text: English with German and English summaries.

Kariman, A., S.M. Ghamsari, and M.R. Mokhber Dezfooli (2001). **Evaluation of analgesia induced by epidural administration of medetomidine in horses.** *Journal of the Faculty of Veterinary Medicine, University of Tehran* 56(2): 49-51. ISSN: 1022-646X.

Descriptors: horses, analgesics, sedatives, muscle relaxants, medetomidine, caudal epidural agents.

Language of Text: Persian with an English summary.

Kasashima, Y., K. Matano, and Y. Mizuno (1997). **[Application of an anesthetic machine with a jet-type respirator in horses].** *Japanese Journal of Veterinary Anesthesia and Surgery* 28(1-2): 15-22. ISSN: 0916-5908.

Descriptors: anesthesia, respiratory system, jet-type respirators, cardiovascular system, chemophysical properties.

Language of Text: Japanese.

Keegan, R.D., S.A. Greene, J.A. Brown, A.B. Weil, and W.M. Bayly (1999). **Effects of pre-exercise frusemide administration and post exercise anaesthesia on cardiopulmonary and acid-base parameters and blood and plasma volumes in horses exercised supramaximally to fatigue.** *Equine Veterinary Journal* 30(Suppl.): 174-177. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Abstract: Six horses were randomly assigned to receive either frusemide (F) (0.5 mg/kg i.v.) or an equivalent volume of saline (S) i.v., 4 h prior to treadmill exercise. Horses were instrumented to enable measurement of heart rate (HR), systolic (SAP), mean (MAP), and diastolic (DAP) carotid arterial pressures, pulmonary artery pressure (PAP), central venous pressure (CVP), pulmonary arterial temperature (TEMP), blood gases, and cardiac output (CO). Plasma (PV) and blood volumes (BV) were measured using 2 injections of Evan's Blue dye. Baseline parameters were recorded while the horse stood quietly. Horses were then administered F or S. Four hours later, they were warmed up for 3 min at 4 m/s and then exercised to the point of fatigue at 115% VO₂max. Horses were anaesthetised immediately following exercise by administration of detomidine (0.04 mg/kg bwt i.v.) followed 5 min later by tiletamine-zolazepam (1.25 mg/kg bwt i.v.). After transporting the horse

to a recovery stall, anaesthesia was maintained with isoflurane in 100% O₂. Data were analysed using a 2-way ANOVA with repeated measures with post hoc differences identified using the Student-Newman-Keul's procedure. Exercise was associated with increases in HR, SAP, MAP, DAP, PAP, CVP, TEMP, PCV, and BV, and decreases in PV, pH, arterial bicarbonate and base excess. Anaesthesia was associated with marked hypercapnia, a decrease in HR following detomidine administration, and persistent pulmonary hypertension despite carotid arterial pressure which returned to baseline. No effects attributable to F were identified at any time during the study.

Descriptors: anesthesia, blood volume, diuretics, furosemide, heart drug interactions, horse physiology, physical conditioning, acid base equilibrium, blood pressure, exercise test, muscle fatigue, respiration.

Keegan, K.G., D.A. Wilson, J.M. Kreeger, M.R. Ellersieck, K.C. Kuo, and Z. Li (1996). **Local distribution of mepivacaine after distal interphalangeal joint injection in horses.** *American Journal of Veterinary Research* 57(4): 422-426. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: metabolism, nervous system, neural coordination, pharmacology, local anesthetic drug, mepivacaine, pharmacokinetics.

Kramer, J., K.G. Keegan, D.A. Wilson, B.K. Smith, and D.J. Wilson (2000). **Kinematics of the hind limb in trotting horses after induced lameness of the distal intertarsal and tarsometatarsal joints and intra-articular administration of anesthetic.** *American Journal of Veterinary Research* 61(9): 1031-1036. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Abstract: OBJECTIVE: To identify hind limb and pelvic kinematic variables that change in trotting horses after induced lameness of the distal intertarsal and tarsometatarsal joints and after subsequent intra-articular administration of anesthetic. ANIMALS: 8 clinically normal adult horses. PROCEDURE: Kinematic measurements were made before and after transient endotoxin-induced lameness of the distal intertarsal and tarsometatarsal joints and after intra-articular administration of anesthetic. Fourteen displacement and joint angle (metatarsophalangeal [fetlock] and tarsal joints) measurements were made on the right hind limb, sacrum, and the right and left tubera coxae. Kinematic measurements were compared by general linear models, using a repeated measures ANOVA. Post hoc multiple comparisons between treatments were evaluated with a Fisher least squared difference test at $\alpha = 0.05$. RESULTS: After lameness induction, fetlock and tarsal joint extension during stance decreased, fetlock joint flexion and hoof height during swing increased, limb protraction decreased, and vertical excursion of the tubera coxae became more asymmetric. After intra-articular administration of anesthetic, limb protraction returned to the degree seen before lameness, and vertical excursion of the tubera coxae became more symmetric. CONCLUSIONS AND CLINICAL RELEVANCE: Increased length of hind limb protraction and symmetry of tubera coxae vertical excursion are sensitive indicators of improvement in tarsal joint lameness. When evaluating changes in tarsal joint lameness, evaluating the horse from the side (to assess limb protraction) is as important as evaluating from the rear (to assess pelvic symmetry).

Descriptors: anesthetics administration and dosage, horse diseases physiopathology, joints physiopathology, lameness, animal physiopathology, biomechanics, gait, hindlimb physiopathology, horses, injections, intra articular veterinary, reproducibility of results, video recording.

Lansdowne, J.L., C.L. Kerr, L.P. Boure, and S.G. Pearce (2005). **Epidural migration of new methylene blue in 0.9% sodium chloride solution or 2% mepivacaine solution following injection into the first intercoccygeal space in foal cadavers and anesthetized foals undergoing laparoscopy.** *American Journal of Veterinary Research* 66(8): 1324-1329. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Abstract: OBJECTIVE: To determine the relationship between epidural cranial migration and injectate volume of an isotonic solution containing dye in laterally recumbent foal cadavers and evaluate the cranial migration and dermatome analgesia of an epidural dye solution during conditions of laparoscopy in foals. ANIMALS: 19 foal cadavers and 8 pony foals. PROCEDURES: Foal cadavers received an epidural injection of dye solution (0.05, 0.1, 0.15, or 0.2 mL/kg) containing 1.2 mg of new methylene blue (NMB)/mL of saline (0.9% NaCl) solution. Length of the dye column and number of intervertebral spaces cranial and caudal to the injection site were measured. Anesthetized foals received an epidural injection of dye solution (0.2 mL/kg) containing saline

solution or 2% mepivacaine. Foals were placed in a 100 head-down position, and pneumoperitoneum was induced. Dermatome analgesia was determined by use of a described electrical stimulus technique. Foals were euthanized, and length of the dye column was measured. **RESULTS:** Epidural cranial migration of dye solution in foal cadavers increased with increasing volume injected. No significant difference was found in epidural cranial migration of a dye solution (0.2 mL/kg) between anesthetized foals undergoing conditions of laparoscopy and foal cadavers in lateral recumbency. Further cranial migration of the dye column occurred than indicated by dermatome analgesia. **CONCLUSIONS AND CLINICAL RELEVANCE:** Epidural cranial migration increases with volume of injectate. On the basis of dermatome analgesia, an epidural injection of 2% mepivacaine (0.2 mL/kg) alone provides analgesia up to at least the caudal thoracic dermatome and could permit caudal laparoscopic surgical procedures in foals.

Descriptors: foals, epidural cranial migration analgesia, injectable analgesia, laparoscopy, dermatome analgesia, mepivacaine, volume of injectate.

Levionnois, O.L., C. Spadavecchia, A. Bergadano, and U. Schatzmann (2005). **Die Verwendung von Opioiden als Schmerzmittel beim Pferd unter besonderer Berücksichtigung der Rückenmarksanästhesie.** [Use of opioids for horse analgesia with particular interest on epidural administration]. *Pferdeheilkunde* 21(4): 311-316. ISSN: 0177-7726.

Descriptors: adverse effects, analgesics, butorphanol, conduction anesthesia, drug combinations, fentanyl, methadone, morphine, opioids, pain, pharmacokinetics, horses.

Language of Text: German with an English summary.

Liechti, J., H. Pauli, N. Jaggin, and U. Schatzmann (2003). **Untersuchungen zum assistierten Aufstehen von Pferden während der Aufwachphase nach einer Inhalationsanästhesie.** [Investigation into the assisted standing up procedure in horses during recovery phase after inhalation anaesthesia]. *Pferdeheilkunde* 19(3): 271-276. ISSN: 0177-7726.

Descriptors: horses, anesthesia recovery, inhaled anesthetics, assisted standing equipment, sling systems.

Language of Text: German with an English summary.

Lin, H.C., C.R. Johnson, S.H. Duran, and B.M. Waldrige (2004). **Effects of intravenous administration of dimethyl sulfoxide on cardiopulmonary and clinicopathologic variables in awake or halothane-anesthetized horses.** *Journal of the American Veterinary Medical Association* 225(4): 560-566, 554. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: horses, cardiovascular system, dimethyl sulfoxide, halothane anesthesia, respiratory rate, heart rate, arterial blood pressure variability.

Love, E.J., J.G. Lane, and P.J. Murison (2006). **Morphine administration in horses anaesthetized for upper respiratory tract surgery.** *Veterinary Anaesthesia and Analgesia* 33(3): 179-188. ISSN: 1467-2987.

Online: <http://dx.doi.org/10.1111/j.1467-2995.2005.00247.x>

NAL Call Number: SF914.V47

Abstract: To determine the effect of morphine administration on commonly monitored cardio-respiratory variables and recovery quality in horses undergoing anaesthesia and surgery. Prospective, randomized clinical study. Thirty-eight Thoroughbred horses, 32 geldings and six mares, 3-13 years old, weighing 411-600 kg. A standard anaesthetic technique was used. Twenty minutes after induction of anaesthesia horses received 0.1 mg kg^[-1] (0.1 m) or 0.2 mg kg^[-1] (0.2 m) morphine by intravenous injection. A control group did not receive morphine. Heart rate, respiratory rate (fr), mean arterial pressure (MAP) and blood gases were measured before morphine administration and every 10 minutes thereafter. Horses were positioned for 35 minutes in right lateral recumbency for tension palatoplasty by cautery and were then moved into dorsal recumbency for additional intraluminal surgery comprising one or more of aryepiglottic fold resection, subepiglottal mucosal resection, ventriculectomy and cordectomy. A subjective recovery score from 0 (worst) to 5 (best) was assigned by a single observer who was unaware of treatment group. Two-way repeated measures anova, one-way anova, Kruskal-Wallis test, Mann-Whitney test, Pearson and Spearman correlation coefficients, and chi-squared tests were used to analyse the data where appropriate. Arterial partial pressure of oxygen (PaO₂) decreased significantly over time and was significantly lower in horses that received morphine. One horse in the control group and two horses in each of the morphine groups had a PaO₂ <13 kPa. No other

significant cardiopulmonary effects were detected. Recovery scores [median (range)] were higher in morphine recipients: 4 (2-5) in 0.1 m, 4 (3-5) in 0.2 m compared with 3 (2-4) in the control group. The lower PaO₂ in morphine recipients did not appear to be of clinical significance in healthy horses because the number of horses with a low PaO₂ was similar between groups. The quality of recovery was significantly better in morphine recipients. These results indicate that morphine may be considered for use in clinical cases although further work is required to assess the analgesic properties of the drug in this species.

Descriptors: anesthesia, morphine administration, blood gases, cardio-respiratory variables, recovery quality, blood pressure, clinical trials, surgical procedures.

Luukkanen, L., T. Katila, and E. Koskinen (1997). **Some effects of multiple administration of detomidine during the last trimester of equine pregnancy.** *Equine Veterinary Journal* 29(5): 400-402. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Abstract: Detomidine was given to 11 pregnant mares at 3 week intervals during the last trimester of pregnancy. Maternal and fetal electrocardiographs were recorded and fetal activity studied by transabdominal ultrasonography, before and 2 h (2, 5, 10, 20, 30, 60, 90 and 120 min) after injection. After parturition, the foals were examined and weighed. Maternal and fetal heart rate showed an initial decline after detomidine administration. Maternal heart rate in the treatment group were lower already 2 min after injection, but a reduction in fetal heart was first seen 5 min after detomidine administration. Mean fetal heart rate at 2 min after detomidine injection was 109, 104, 95 and 90 beats/min, whereas at 5 min it was 80, 76, 72 and 66 beats/min in the 2nd, 3rd, 4th and 5th examination session, respectively. The heart rates did not revert to the control values during follow-up. Decline and recovery patterns were quite similar during all examination sessions. The mares exhibited conductive disturbances 2 min after detomidine administration, but fetal heart rhythm remained regular. Fetal activity was decreased at 5 min but had reverted to control values about 90 min after detomidine administration. Administration of detomidine (0.015 mg/kg) to healthy pregnant mares at 3 week intervals during the last trimester had no measurable detrimental effects on the outcome of pregnancy.

Descriptors: detomidine, pregnant mares, fetal activity recordings, maternal and fetal heart rate, effect of detomidine on outcome of pregnancy.

Machon, R. (1999). **Injectable techniques in equine anaesthesia.** In: *NZVA Conference, June 3, 1928-July 3, 1999, Nelson, New Zealand*, Veterinary Continuing Education, Massey University: Vol. 193, p. 1-14.

NAL Call Number: SF604.P82

Descriptors: horses, anesthesia, injection methods.

Mama, K.R. (2000). **Anesthetic Management of the Horse: Intravenous Anesthesia.** In: E.P. Steffey (Editor), *Recent Advances in Anesthetic Management of Large Animals*, International Veterinary Information Service.

Online: http://www.ivis.org/advances/Steffey_Anesthesia/mama_horse/ivis.pdf

Descriptors: horses, anesthesia, intravenous administration, clinical techniques.

Mama, K.R., P.J. Pascoe, E.P. Steffey, and C. Kollias Baker (1998). **Comparison of two techniques for total intravenous anesthesia in horses.** *American Journal of Veterinary Research* 59(10): 1292-1298. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, anesthesia, ketamine, propofol, intravenous injection, infusion, heart rate, blood pressure, cardiac output, body temperature, respiration rate, blood gases, hematocrit, blood protein, pharmacokinetics, dosage effects.

Marntell, S. and G. Nyman (1996). **Prolonging dissociative anaesthesia in horses with a repeated bolus injection.** *Journal of Veterinary Anaesthesia* 23(2): 64-69. ISSN: 0950-7817.

Descriptors: horses, Standardbreds, anesthesia maintenance techniques, romifidine, ketamine, cardiovascular system, respiratory system.

Matthews, N.S., M.K. Chaffin, S.W. Erickson, and W.A. Overhulse (1995). **Propofol anesthesia for non-surgical procedures of neonatal foals.** *Equine Practice* 17(3): 15-16, 19-20. ISSN: 0162-8941.

NAL Call Number: SF951.E62

Descriptors: foals, newborn animals, injectable anesthetics, anesthesia, drug effects, adverse effects, respiration rate, heart rate, blood pressure, blood, gases, bicarbonates.

Mattson, S., L. Boure, S. Pearce, C. Kerr, and S. Mattson (2001). **Clinical observation: Bilateral upward fixation of the patella following epidural administration of morphine.** *Journal of the American Veterinary Medical Association* 219(3): 298-299. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: morphine, epidural administration, patellar ligament, analgesics, injections, horses.

Maxwell, L.K., S.M. Thomasy, N. Slovis, and C. Kollias Baker (2003). **Pharmacokinetics of fentanyl following intravenous and transdermal administration in horses.** *Equine Veterinary Journal* 35(5): 484-490. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Abstract: REASONS FOR PERFORMING STUDY: Although fentanyl has been reported to cause CNS excitation in horses, a transdermal therapeutic system (TTS) containing this mu agonist has recently been used empirically in equine medicine to treat moderate to severe pain. A better understanding of the disposition of fentanyl following transdermal administration would facilitate the clinical use of TTS fentanyl to obtain analgesia in horses. OBJECTIVES: To determine the pharmacokinetics of fentanyl following i.v. and TTS patch administration in healthy, mature horses and to evaluate the tolerance of horses to TTS fentanyl administration. METHODS: The pharmacokinetics of fentanyl in serum were assessed following a single i.v. dose, a single TTS dose, and multiple TTS doses in 6 healthy horses. Physical examinations, haematology and serum biochemistry analyses during transdermal fentanyl application were then performed to determine tolerance of continuous fentanyl administration. RESULTS: Fentanyl was very rapidly and completely absorbed following a single TTS dose. Mean serum fentanyl concentrations consistent with analgesia in other species were reached by 1 h and maintained until 32 h after patch application. Similar steady state serum concentrations were obtained when multiple doses of TTS fentanyl were administered every 48 or 72 h over 8 or 9 days, with less fluctuation in serum concentrations during the 48 h dosing interval. Three horses exhibited brief (< 12 h) episodes of increased body temperature; however, transdermal fentanyl administrations were not associated with other significant changes in haematology and biochemistry panels or physical examination findings. CONCLUSIONS AND POTENTIAL RELEVANCE: Although the pharmacodynamics of fentanyl have not been investigated fully in horses, transdermally-administered fentanyl exhibited a favourable pharmacokinetic profile without clinically relevant side effects and may be a useful analgesic in equine patients.

Descriptors: analgesics, fentanyl, horse metabolism, drug dose response relationship, routes of administration, intravenous injections, pain, administration of fentanyl transdermally.

Mee, A.M., P.J. Cripps, and R.S. Jones (1998). **A retrospective study of mortality associated with general anaesthesia in horses: elective procedures.** *The Veterinary Record* 142 (11): 275-276. ISSN: 0042-4900.

NAL Call Number: 41.8 V641

Descriptors: horses, general anesthesia, surgical procedures, risk factors, complications.

Milosavljevic, P. and S. Knezevic (2004). **General injection anesthesia in horse. Opsta injekciona anestezija konja.** In: *Sesto Medjunarodno Savetovanje iz Klinicke Patologije i Terapije. [Clinica Veterinaria 2004: Proceedings of the Sixth International Symposium in Animal Clinical Pathology and Therapy], June 14, 2004-June 18, 2004, Beograd (Serbia and Montenegro), Fakultet Veterinarske Medicine: p. 126-132. ISBN: 86-81043-19-6.*

Descriptors: horses, anesthesia, neurotropic drugs, drugs, Equidae, mammals, Perissodactyla.

Language of Text: Serbian with English and Serbian summaries.

Mosley, C. (2006). **Intravenous techniques for field anesthesia.** In: *Ahead of the Curve: OVMA Conference Proceedings, January 26, 2006, Toronto, Canada, Ontario Veterinary Medical Association. Milton, Canada, p. 288-293.*

Online: <http://www.ovma.org>

Descriptors: horses, anesthesia, guaifenesin, intravenous injection techniques, ketamine, xylazine.

Muir, W.W. and C. Scicluna (1998). **Anaesthesia and anaesthetic techniques in horses.** *Equine Veterinary Education*

10(1): 33-41. ISSN: 0957-7734.

NAL Call Number: SF951.E67

Descriptors: horses, anesthesia, veterinary procedures, clinical techniques.

Natalini, C.C., S.D. Alves, A.G. Guedes, A.S. Polydoro, J.T. Brondani, and S. Bopp (2004). **Epidural administration of tiletamine/zolazepam in horses.** *Veterinary Anaesthesia and Analgesia* 31(2): 79-85.

Abstract: OBJECTIVES: To evaluate the analgesic, physiologic, and behavioral effects of the epidural administration of tiletamine/zolazepam in horses. STUDY DESIGN: Prospective, double-blind, randomized experimental study. ANIMALS: Five adult, healthy horses aged 10-16 years and weighing (mean +/- SD) 400 +/- 98 kg. METHODS: The horses were sedated with 1.0 mg kg(-1) intravenous (IV) xylazine, and an epidural catheter was placed into the first intercocygeal intervertebral space. After a 48-hour resting period, epidural tiletamine/zolazepam, 0.5 mg kg(-1) (treatment I) or 1.0 mg kg(-1) (treatment II), diluted up to 5 mL in sterile water, was administered with a 1-week interval between the treatments. Heart rate, respiratory rate, arterial blood pressure, and sedation were evaluated. In order to evaluate the respiratory effects, blood from the carotid artery was withdrawn at time 0 (baseline), and then after 60 and 240 minutes. Analgesia was evaluated by applying a noxious stimulus with blunt-tipped forceps on the perineal region, and graded as complete, moderate, or absent. Data were collected before tiletamine/zolazepam administration and at 15-minute intervals for 120 minutes, and 4 hours after tiletamine/zolazepam administration. Data were analyzed with anova and Bonferroni's test with $p < 0.05$. RESULTS: The results showed no significant difference between treatments in cardiovascular and respiratory measurements. Sedation was observed with both doses, and it was significantly different from baseline at 60, 75, and 90 minutes in treatment II. Moderate analgesia and locomotor ataxia were observed with both the treatments. CONCLUSIONS AND CLINICAL RELEVANCE: The results suggest that caudal epidural 0.5 and 1.0 mg kg(-1) tiletamine/zolazepam increases the threshold to pressure stimulation in the perineal region in horses. The use of epidural tiletamine/zolazepam could be indicated for short-term moderate epidural analgesia. There are no studies examining spinal toxicity of Telazol, and further studies are necessary before recommending clinical use of this technique.

Descriptors: epidural anesthesia, horses, blood pressure, drug effects on heart rate and respiration, behavioral and physiologic effects, tiletamine administration and dosage, zolazepam administration and dosage, Telazol.

Natalini, C.C., G. Pettifer, G. Hosgood, A.F. Cunha da, S.D.L. Alves, C.A. Valadao, A.J. Lewis, and I.G. Fuchs (2004).

The cardiopulmonary, behavioral, and analgesic effects of epidural administration of hydromorphone in standing and anesthetized horses. In: *Proceedings of the 50th Annual Convention of the American Association of Equine Practitioners, December 4, 2004-December 8, 2004, Denver, Colorado, USA, Lexington, USA:*

American Association of Equine Practitioners (AAEP), p. 494-501.

Online: <http://www.aaep.org>

Descriptors: adverse effects, anesthesia, animal behavior, blood gases, blood pressure, cardiac output, conduction anesthesia, heart rate, isoflurane, morphine, opioids, pharmacodynamics, pharmacokinetics, respiration rate, xylazine, horses.

Nielsen, C.G. (1995). **Propofol: et nyt injektionsanaestetikum. [Propofol: a new anaesthetic for injection (review)].** *Dansk Veterinaertidsskrift* 78(8): 411-414. ISSN: 0106-6854.

NAL Call Number: 41.9 D23

Descriptors: dogs, cats, sheep, goats, swine, calves, horses, pigeons, anesthetics, puppies, pharmacology, side effects, drug combinations, respiratory system, cardiovascular system, clinical trials, age groups, animal morphology, domestic animals, Propofol, experimentation, livestock, neurotropic drugs, ruminants, toxicity, young animals.

Language of Text: Danish.

Nunez, E., E.P. Steffey, L. Ocampo, A. Rodriguez, and A.A. Garcia (2004). **Effects of alpha2-adrenergic receptor agonists on urine production in horses deprived of food and water.** *American Journal of Veterinary Research* 65(10): 1342-1346. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Abstract: OBJECTIVE: To quantitate the dose- and time-related effects of IV administration of xylazine and detomidine on urine characteristics in horses deprived of feed and water. ANIMALS: 6 horses. PROCEDURE:

Feed and water were withheld for 24 hours followed by i.v. administration of saline (0.9% NaCl) solution, xylazine (0.5 or 1.0 mg/kg), or detomidine (0.03 mg/kg). Horses were treated 4 times, each time with a different protocol. Following treatment, urine and blood samples were obtained at 15, 30, 60, 120, and 180 minutes. Blood samples were analyzed for PCV and serum concentrations of total plasma solids, sodium, and potassium. Urine samples were analyzed for pH and concentrations of glucose, proteins, sodium, and potassium.

RESULTS: Baseline (before treatment) urine flow was 0.30 +/- 0.03 mL/kg/h and did not significantly change after treatment with saline solution and low-dose xylazine but transiently increased by 1 hour after treatment with high-dose xylazine or detomidine. Total urine output at 2 hours following treatment was 312 +/- 101 mL versus 4,845 +/- 272 mL for saline solution and detomidine, respectively. Absolute values of urine concentrations of sodium and potassium also variably increased following xylazine and detomidine administration. **CONCLUSIONS AND CLINICAL RELEVANCE:** Xylazine and detomidine administration in horses deprived of feed and water causes transient increases in urine volume and loss of sodium and potassium. Increase in urine flow is directly related to dose and type of alpha2-adrenergic receptor agonist. Dehydration in horses may be exacerbated by concurrent administration of alpha2-adrenergic receptor agonists.

Descriptors: adrenergic agonists, food and water deprivation, horses, xylazine, detomidine, urine characteristics, alpha2-adrenergic receptor agonist, dehydration.

Ohmura, H., M. Akai, K. Kawasaki, T. Yamanaya, and T. Kato (2002). **Influence of bolus injection of thiopental sodium on respiratory and cardiovascular function under general anesthesia in the horse.** *Journal of Equine Science* 13(4): 123-126. ISSN: 1340-3516.

NAL Call Number: SF277.J37

Descriptors: horses, general anesthesia, cardiovascular system, respiratory system, thiopental sodium, respiratory frequency, arterial pressure, tidal volume, heart rate, stroke volume, cardiac output.

Ohwa, Y. (2001). **[Examination, treatment and surgical facilities at the Equine Medical Centre].** *Journal of Veterinary Medicine* 54(10): 850-853. ISSN: 0447-0192.

Descriptors: horses, veterinary facilities, veterinary examination methods, veterinary treatment methods.

Language of Text: Japanese.

Orlianges, E. (1999). **L'administration epidurale des morphinomimetiques chez le cheval: une voie a exploiter. [Epidural administration of opioids in horses].** *Pratique Veterinaire Equine* 31(121): 55-58. ISSN: 0395-8639.

NAL Call Number: SF957.P7

Descriptors: horses, opioids, pain management, analgesic administration, lidocaine, morphine, butorphanol, veterinary procedures.

Language of Text: French with an English summary.

Ovidiu, T.A., L. Ionita, and G.I. Cristian (2004). **Method for general anaesthesia in horses.** In: *Clinica Veterinaria 2004: Proceedings of the Sixth International Symposium in Animal Clinical Pathology and Therapy, June 14, 2004-June 18, 2004, Belgrade (Serbia and Montenegro)*, Faculty of Veterinary Medicine: p. 404-405. ISBN: 86-81043-19-6.

Descriptors: horses, anesthesia, anesthetics, ketamine, drugs, Equidae, mammals, neurotropic drugs, Perissodactyla.

Peck, K.E., A.C. Ray, G. Manuel, M.M. Rao, and J. Foos (1996). **Quantification of phenylbutazone in equine sera by use of high-performance liquid chromatography with a nonevaporative extraction technique.** *American Journal of Veterinary Research* 57(11): 1522-1524. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: bute, phenylbutazone, analgesics, high performance liquid chromatography, neurotropic drugs, oxyphenbutazone, extraction, blood serum.

Piccot Crezollet, C., J.M. Casamatta, and O.M. Lepage (2005). **Anesthesies semiologiques digitales chez le cheval: technique et elements d'interpretation. [Digital semiological anesthesia in horses: Technique and elements of interpretation].** *Canadian Veterinary Journal* 46(9): 807-813. ISSN: 0008-5286.

NAL Call Number: 41.8 R3224

Abstract: Digital semiological anesthesia in horses: Technique and elements of interpretation. Semiological anesthesia of the pes is used during examinations for lameness in horses. Recent research data on the distal digital, distal interphalangeal articular, and podotrochlear intrathecal nerve blocks indicate that they are less than specific when considered in isolation. They should be used in combination to localize pain in the pes. A positive response to anesthesia of the distal interphalangeal articulation could also indicate that the source of the pain was in the podotrochlear apparatus or the dorsal part of the sole. Podotrochlear anesthesia also anesthetizes the dorsal part of the sole and, later, the distal interphalangeal joint. Distal digital anesthesia affects a large palmar area of the hoof and extends dorsally. Overall, basic research provides little support for the practical uses of semiological blocks.

Descriptors: horses, lameness examination techniques, pain location methods, digital semiological anesthesia.

Language of Text: French.

Popot, M.A., M. Jaubert, F. Balssa, and Y. Bonnaire (2001). **Detection of dipyron administration in the horse by gas chromatography/mass spectrometry.** In: *Proceedings of the 13th International Conference of Racing Analysts and Veterinarians, 2000, Cambridge, UK*, R & W Publications (Newmarket) Ltd.: Newmarket, UK, p. 386-390.

Descriptors: metamizole, nonsteroidal anti-inflammatory drug, antipyretic, horses, drug residue detection, analgesics, urine analysis, gas chromatography, mass spectrometry.

Quandt, J.E. (1996). **Anaesthetic techniques and considerations in foals.** *Compendium on Continuing Education for the Practicing Veterinarian* 18(3): 307-312. ISSN: 0193-1903.

NAL Call Number: SF601.C66

Descriptors: foals, anesthetic techniques, veterinary procedures.

Raisis, A.L. (2005). **Skeletal muscle blood flow in anaesthetized horses. Part I. Measurement techniques.** *Veterinary Anaesthesia and Analgesia* 32(6): 324-30.

Abstract: OBJECTIVE: The objective of this review was to describe the methodology and limitations of techniques that have been used to measure skeletal muscle blood flow in anaesthetized horses. DATABASE USED: Pubmed, personal files. CONCLUSION: Numerous techniques have been used in horses to study skeletal muscle blood flow during anaesthesia and after the administration of vasoactive agents. Of the available techniques, blood flow measurements are limited to either microvascular flow (radioactive xenon, laser Doppler flowmetry) or total blood flow (radioactive microspheres, electromagnetic flowmetry, Doppler ultrasonography). None of the techniques currently available are able to fully assess the distribution of flow throughout the skeletal muscle. Near-infrared spectroscopy has the potential to assess the adequacy of oxygenation within muscles; however, this technique is not without limitations, and more work is required to assess its suitability. Understanding the limitations of these techniques is an important prerequisite to the critical evaluation of the information currently available on the effects of anaesthesia and vasoactive drugs on skeletal muscle blood flow.

Descriptors: anesthetized horses, skeletal muscle blood flow measurement techniques, methodology, microvascular flow, total blood flow, radioactive xenon, laser Doppler flowmetry, radioactive microspheres, electromagnetic flowmetry, Doppler ultrasonography.

Ratajczak, K. and Z. Kielbowicz (1995). **Haemodynamic consequences of immediate intra-anaesthesia application of intermittent positive pressure breathing in horses.** *Archivum Veterinarium Polonicum* 35(1-2): 5-17. ISSN: 1230-5359.

Descriptors: horses, lengthy operative procedures, anesthetic management, controlled ventilation, cardiovascular system.

Ratajczak, K., P. Stochnij, and P. Skrzypczak (2000). **[Anaesthetic compound and its application in general anaesthesia of horses].** *Medycyna Weterynaryjna* 56(2): 107-113. ISSN: 0025-8628.

NAL Call Number: 41.8 M463

Descriptors: horses, anesthesiology, anesthetic maintenance, anesthetic protocol.

Language of Text: Polish.

Roncada, P., N. Romagnoli, A. Spadari, A. Venturini, A. Barbagallo, and A. Zaghini (2003). **Andamento cinetico del midazolam nel cavallo dopo somministrazione endovenosa. [Kinetic of midazolam in the horse after intravenous administration]**. In : *Atti della Societa Italiana delle Scienze Veterinarie (Italy). [Italian Society of Veterinary Science. 57. Annual meeting], September 25, 2003-September 27, 2003, Ischia, Napoli (Italy)*, p. 227-228.

Descriptors: horses, anesthesia, anesthetics, muscle relaxants, injection, blood plasma, HPLC, analytical methods, application methods, blood, chromatography, drugs, Equidae, mammals, neurotropic drugs, Perissodactyla.

Language of Text: Italian with an English summary.

Ross, M.W. (1996). **Carpal and high palmar injection techniques**. *Proceedings of the North American Veterinary Conference* 10: 597.

NAL Call Number: SF605.N672

Descriptors: horses, anesthesia.

Sabiel, J. (1995). **Pramedikation und Induktion von Risikonarkosen beim Pferd mit Romifidine, Ketamin und Diazepam im Verleich mit einer Standardmethode. [Premedication and induction of risk-anesthesia in horses with romifidine, ketamin and diazepam, compared with a standard method]**. Hannover. 118 p.

NAL Call Number: DISS F1995162

Descriptors: horses, anesthesiology, comparison anesthesia induction methods, romifidine, ketamine, diazepam.

Language of Text: German with an English summary.

Notes: Thesis.

Sciicluna, C. (1997). **Detomidine/ketamine/ketamine: evaluation d'un nouveau protocole d'anesthesie moyenne duree pour cheval. [Detomidine/ketamine/ketamine: evaluation of a new procedure for medium term anaesthesia in the horse]**. *Pratique Veterinaire Equine* 29(4): 247-252. ISSN: 0395-8639.

NAL Call Number: SF957.P7

Descriptors: anesthesia, castration, ketamine, detomidine, horses.

Language of Text: French with an English summary.

Sellon, D.C., V.L. Monroe, M.C. Roberts, and M.G. Papich (2001). **Pharmacokinetics and adverse effects of butorphanol administered by single intravenous injection or continuous intravenous infusion in horses**. *American Journal of Veterinary Research* 62(2): 183-189. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Abstract: OBJECTIVE: To determine an infusion rate of butorphanol tartrate in horses that would maintain therapeutic plasma drug concentrations while minimizing development of adverse behavioral and gastrointestinal tract effects. ANIMALS: 10 healthy adult horses. PROCEDURE: Plasma butorphanol concentrations were determined by use of high-performance liquid chromatography following administration of butorphanol by single IV injection (0.1 to 0.13 mg/kg of body weight) or continuous IV infusion (loading dose, 17.8 microg/kg; infusion dosage, 23.7 microg/kg/h for 24 hours). Pharmacokinetic variables were calculated, and changes in physical examination data, gastrointestinal tract transit time, and behavior were determined over time. RESULTS: A single IV injection of butorphanol was associated with adverse behavioral and gastrointestinal tract effects including ataxia, decreased borborygmi, and decreased defecation. Elimination half-life of butorphanol was brief (44.37 minutes). Adverse gastrointestinal tract effects were less apparent during continuous 24-hour infusion of butorphanol at a dosage that resulted in a mean plasma concentration of 29 ng/ml, compared with effects after a single IV injection. No adverse behavioral effects were observed during or after continuous infusion. CONCLUSIONS AND CLINICAL RELEVANCE: Continuous IV infusion of butorphanol for 24 hours maintained plasma butorphanol concentrations within a range associated with analgesia. Adverse behavioral and gastrointestinal tract effects were minimized during infusion, compared with a single injection of butorphanol. Continuous infusion of butorphanol may be a useful treatment to induce analgesia in horses.

Descriptors: analgesics, drug effects on behavior, butorphanol, gastrointestinal transit, horse metabolism, high pressure liquid chromatography, cross over studies, half life, intravenous infusions and injections.

Shini, S., A.M. Klaus, and H.J. Hapke (1997). **Eliminationskinetik von Diazepam nach intravenöser Applikation beim Pferd. [Kinetics of elimination of diazepam after intravenous injection in horses].** *Deutsche Tierärztliche Wochenschrift* 104(1): 22-25. ISSN: 0341-6593.

NAL Call Number: 41.8 D482

Abstract: Diazepam is used in veterinary medicine as sedative and pre-anaesthetic agent. This publication describes the plasma-concentration time curve for diazepam and its metabolite in horses suffering from colic after intravenous application as pre-anaesthetic agent. Elimination half-life ($t_{1/2}$ beta) after a dose of 0.05-0.08 mg/kg (30-50 mg Diazepam per horse) was 7.5 to 13.2 h. Total clearance (Cl_{tot}) between 1.86 and 3.44 ml/min/kg was detected and apparent volume of distribution in steady state (V_{diss}) was 1.98 to 2.25 l/kg. Diazepam was still found in serum after 24 h. The metabolite oxazepam could be found in plasma. Its elimination half-life was 14-16.5 hours.

Descriptors: diazepam, sedative, pre-anesthesia, use of diazepam in horses with colic, elimination half-life, metabolic clearance rate, horses.

Language of Text: German with an English summary.

Singh, M., V. Kumar, A.C. Varshney, S.K. Sharma, and J.M. Nagam (1996). **Clinico-biochemical effects of xylazine administration in Spiti ponies - a clinical study.** *Centaur Myslapore* 13(2): 21-23.

Descriptors: horses, castration, anesthesia, xylazine, pain management, local analgesia.

Skarda, R.T. and W.W. Muir III (2001). **Analgesic, hemodynamic, and respiratory effects induced by caudal epidural administration of meperidine hydrochloride in mares.** *American Journal of Veterinary Research* 62(7): 1001-1007. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Abstract: OBJECTIVE: To determine the analgesic, hemodynamic, and respiratory effects induced by caudal epidural administration of meperidine hydrochloride in mares. ANIMALS: 7 healthy mares. Procedure: Each mare received meperidine (5%; 0.8 mg/kg of body weight) or saline (0.9% NaCl) solution via caudal epidural injection on 2 occasions. At least 2 weeks elapsed between treatments. Degree of analgesia in response to noxious electrical, thermal, and skin and muscle prick stimuli was determined before and for 5 hours after treatment. In addition, cardiovascular and respiratory variables were measured and degree of sedation (head position) and ataxia (pelvic limb position) evaluated. RESULTS: Caudal epidural administration of meperidine induced bilateral analgesia extending from the coccygeal to S1 dermatomes in standing mares; degree of sedation and ataxia was minimal. Mean (+/- SD) onset of analgesia was 12 +/- 4 minutes after meperidine administration, and duration of analgesia ranged from 240 minutes to the entire 300-minute testing period. Heart and respiratory rates, rectal temperature, arterial blood pressures, Hct, PaO₂, PaCO₂, pH_a, total solids and bicarbonate concentrations, and base excess were not significantly different from baseline values after caudal epidural administration of either meperidine or saline solution. CONCLUSIONS AND CLINICAL RELEVANCE: Caudal epidural administration of meperidine induced prolonged perineal analgesia in healthy mares. Degree of sedation and ataxia was minimal, and adverse cardiorespiratory effects were not detected. Meperidine may be a useful agent for induction of caudal epidural analgesia in mares undergoing prolonged diagnostic, obstetric, or surgical procedures in the anal and perineal regions.

Descriptors: meperidine hydrochloride, respiratory effects, caudal epidural administration, mares, analgesia, hemodynamic effects, induction of prolonged perineal analgesia, meperidine.

Skarda, R.T. and W.W. Muir III (1999). **Effects of intravenously administered yohimbine on antinociceptive, cardiorespiratory, and postural changes induced by epidural administration of detomidine hydrochloride solution to healthy mares.** *American Journal of Veterinary Research* 60(10): 1262-1270. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: mares, yohimbine, intravenous injection, narcotic antagonists, detomidine, conduction anesthesia, drug effects, pain, cardiovascular system, respiratory system, position.

Skarda, R.T. and W.W. Muir III (1996). **Comparison of antinociceptive, cardiovascular, and respiratory effects, head ptosis, and position of pelvic limbs in mares after caudal epidural administration of xylazine and detomidine hydrochloride solution.** *American Journal of Veterinary Research* 57(9): 1338-1345. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: mares, xylazine, detomidine, conduction anesthesia, pain, drug effects, cardiovascular system, respiratory system, head, limbs, position.

Smith, G.W., P.D. Constable, J.H. Foreman, R.M. Eppley, A.L. Waggoner, M.E. Tumbleson, and W.M. Haschek (2002). **Cardiovascular changes associated with intravenous administration of fumonisin B1 in horses.** *American Journal of Veterinary Research* 63(4): 538-545. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, cardiovascular system, leukoencephalomalacia, fumosin B1, neurologic disease, toxins, neurotoxicity, hepatotoxicity.

Souza, A.H., C.A.A. Valadao, A. Queiroz Neto, G. Zamur, and V. Coelho (2002). **Efeito da injeção subcutânea de doses baixas de cetamina em equinos. [Effect of subcutaneous injection of low doses of ketamine in horses].** *Ars Veterinaria* 18(3): 223-230. ISSN: 0102-6380.

NAL Call Number: SF604.A78

Descriptors: horses, anesthesia, ketamine, subcutaneous injections, effects of dosage variation.

Language of Text: Portuguese with an English summary.

Spadavecchia, C., O. Levionnois, P.W. Kronen, M. Leandri, L. Spadavecchia, and U. Schatzmann (2006). **Evaluation of administration of isoflurane at approximately the minimum alveolar concentration on depression of a nociceptive withdrawal reflex evoked by transcutaneous electrical stimulation in ponies.** *American Journal of Veterinary Research* 67(5): 762-9.

Abstract: OBJECTIVE: To investigate effects of isoflurane at approximately the minimum alveolar concentration (MAC) on the nociceptive withdrawal reflex (NWR) of the forelimb of ponies as a method for quantifying anesthetic potency. ANIMALS: 7 healthy adult Shetland ponies. PROCEDURE: Individual MAC (iMAC) for isoflurane was determined for each pony. Then, effects of isoflurane administered at 0.85, 0.95, and 1.05 iMAC on the NWR were assessed. At each concentration, the NWR threshold was defined electromyographically for the common digital extensor and deltoid muscles by stimulating the digital nerve; additional electrical stimulations (3, 5, 10, 20, 30, and 40 mA) were delivered, and the evoked activity was recorded and analyzed. After the end of anesthesia, the NWR threshold was assessed in standing ponies. RESULTS: Mean +/- SD MAC of isoflurane was 1.0 +/- 0.2%. The NWR thresholds for both muscles increased significantly in a concentration-dependent manner during anesthesia, whereas they decreased in awake ponies. Significantly higher thresholds were found for the deltoid muscle, compared with thresholds for the common digital extensor muscle, in anesthetized ponies. At each iMAC tested, amplitudes of the reflex responses from both muscles increased as stimulus intensities increased from 3 to 40 mA. A concentration-dependent depression of evoked reflexes with reduction in slopes of the stimulus-response functions was detected. CONCLUSIONS AND CLINICAL RELEVANCE: Anesthetic-induced changes in sensory-motor processing in ponies anesthetized with isoflurane at concentrations of approximately 1.0 MAC can be detected by assessment of NWR. This method will permit comparison of effects of inhaled anesthetics or anesthetic combinations on spinal processing in equids.

Descriptors: anesthesia, isoflurane, minimum alveolar concentration, nociceptive withdrawal reflex, anesthetic potency, dosage effects, electric stimulation.

Spadavecchia, C., N. Schmucker, and U. Schatzmann (1999). **Untersuchungen zur Injectionsanästhesie (TIVA) des Pferdes mit Ketamin / Guaifenesin / Xylazin: Versuche mit einer computergesteuerten Infusion. [Investigations into injection anesthesia (TIVA) of the horse with ketamine-guaifenesin-xylazine: experiences with computerized pump infusion].** *Praktische Tierarzt* 80(2): 118-122. ISSN: 0032-681X.

NAL Call Number: 41.8 P882

Descriptors: horses, infusion anesthesia, inhalation anesthesia alternatives, guaifenesin, ketamine, xylazine.

Language of Text: German with an English summary.

Spriet, M., F. David, and Y. Rossier (2004). **Ultrasonographic control of navicular bursa injection.** *Equine Veterinary Journal* 36(7): 637-639. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, clinical techniques, navicular disease, pain management, ultrasonography.

Stanway, G. (2001). **Anaesthesia for minor surgical procedures in the horse.** *In Practice* 23(1): 22-29. ISSN: 0263-841X.

NAL Call Number: SF601.I4

Descriptors: horses, anesthesia, surgery, maintenance of anesthesia, monitoring protocol, associated risks.

Sysel, A.M., R.S. Pleasant, J.D. Jacobson, H.D. Moll, L.D. Warnick, D.P. Sponenberg, and P. Eyre (1997). **Systemic and local effects associated with long-term epidural catheterization and morphine-detomidine administration in horses.** *Veterinary Surgery* 26(2): 141-149. ISSN: 0161-3499.

NAL Call Number: SF911.V43

Descriptors: horses, conduction anesthesia, morphine, detomidine, drug combinations, catheters, adverse effects, safety.

Taylor, P.M. (2002). **Anesthetic protocols: pros and cons of different methods.** *Proceedings of the North American Veterinary Conference* 16: 147-148.

NAL Call Number: SF605.N672

Descriptors: horses, anesthesia, methodology.

Taylor, P.M. (2002). **Equine epidural anesthesia and sedation techniques.** *Proceedings of the North American Veterinary Conference* 16: 151-153.

NAL Call Number: SF605.N672

Descriptors: horses, anesthesia, neuroleptics.

Thomasy, S.M., E.P. Steffey, K.R. Mama, A. Solano, and S.D. Stanley (2006). **The effects of i.v. fentanyl administration on the minimum alveolar concentration of isoflurane in horses.** *British Journal of Anaesthesia* 97(2): 232-7.

Abstract: BACKGROUND: Fentanyl decreases the minimum alveolar concentration (MAC) of inhaled anaesthetics and has been used clinically to reduce the requirements of other anaesthetic drugs in humans and small animals. We hypothesized that i.v. fentanyl would decrease the MAC of isoflurane in horses in a dose-dependent manner. METHODS: Following determination of baseline MAC of isoflurane, fentanyl was administered i.v. to target plasma concentrations of 1, 8 and 16 ng ml⁻¹. Each horse was randomly assigned two of three target concentrations administered in ascending order. Loading and infusion doses for each horse were determined from previously derived individual pharmacokinetic values. Isoflurane MAC determination began 45 min after fentanyl administration at each target fentanyl concentration. Venous blood was collected at fixed intervals during the infusion for measurement of plasma fentanyl concentrations. RESULTS: Mean actual fentanyl plasma concentrations were 0 (baseline), and 0.72 (sd 0.26), 8.43 (3.22), and 13.31 (6.66) ng ml⁻¹ for the target concentrations of 1, 8 and 16 ng ml⁻¹, respectively. The corresponding isoflurane MAC values were a baseline of 1.57 (0.23), and 1.51 (0.24), 1.41 (0.23) and 1.37 (0.09)%, respectively. The fentanyl concentrations of 0.72 and 8.43 ng ml⁻¹ did not significantly alter the MAC of isoflurane, but an 18 (7)% ISO-MAC reduction was observed at the 13.31 ng ml⁻¹ concentration. CONCLUSIONS: These results cautiously encourage further study of fentanyl as an opioid anaesthetic adjunct to inhalant anaesthesia in horses.

Descriptors: inhaled anesthetics, dose requirements, fentanyl, minimum alveolar concentration, isoflurane.

Trim, C.M. (1998). **Monitoring during anaesthesia: techniques and interpretation.** *Equine Veterinary Education* 10(4): 207-218. ISSN: 0957-7734.

NAL Call Number: SF951.E67

Descriptors: veterinary procedures, anesthesia, monitoring techniques.

Van der Woerdt, A., B.C. Gilger, D.A. Wilkie, and S.M. Strauch (1995). **Effect of auriculopalpebral nerve block and intravenous administration of xylazine on intraocular pressure and corneal thickness in horses.** *American Journal of Veterinary Research* 56(2): 155-158. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Abstract: Intraocular pressure (IOP) was measured, using applanation tonometry, in both eyes of 20 horses after

topical application of 0.5% proparacaine to the cornea. Ultrasonic pachymetry was used to measure central, mid-peripheral, and peripheral corneal thickness (CT) in all 4 quadrants of both eyes of 25 horses. All measurements were repeated after auriculopalpebral nerve block, sedation by IV administration of xylazine, or combination of nerve block and sedation. Mean IOP after topical anesthesia of the cornea was 20.6 +/- 4.7 mm of Hg for the left eye and 20.35 +/- 3.7 mm of Hg for the right eye. Mean central CT was 793.2 +/- 42.3 micrometers. The peripheral part of the cornea was significantly ($P < 0.05$) thicker, on average, than the central part of the cornea. Auriculopalpebral nerve block had no significant effect on IOP or CT. Intravenous administration of xylazine resulted in a significant ($P < 0.05$) decrease in IOP, but had no effect on CT.

Descriptors: horses, cornea, thickness, eyes, internal pressure, peripheral nerves, local anesthetics, xylazine, intravenous injection, mepivacaine-hydrochloride.

Wagner, A.E. (1995). **Responses of horses to common anesthetic techniques.** *Proceedings From the Annual Convention of the American Association of Equine Practitioners* 41: 117-120. ISSN: 0065-7182.

NAL Call Number: SF601.A46

Descriptors: effect of anesthesia on horses, anesthetics, drugs, neurotropic drugs, veterinary medicine.

Wagner, A.E., C.I. Dunlop, E.M. Wertz, P.L. Chapman, G.M. Baxter, and L.S. Klopp (1995). **Hemodynamic responses of horses to anesthesia and surgery, before and after administration of a low dose of endotoxin.** *Veterinary Surgery* 24(1): 78-85. ISSN: 0161-3499.

NAL Call Number: SF911.V43

Descriptors: horses, hemodynamics, anesthesia, surgery, endotoxins, cardiovascular system, respiratory system, disease models, *Escherichia coli*, colic.

Wagner, A.E. and P.W. Hellyer (2000). **Survey of anesthesia techniques and concerns in private veterinary practice.** *Journal of the American Veterinary Medical Association* 217(11): 1652-1657. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: inhalation anesthesia, intravenous anesthesia, methods of providing anesthetics, cats, dogs, horses, questionnaires, veterinary medicine, private practice veterinarians.

Weil, A.B., R.D. Keegan, and S.A. Greene (1997). **Effect of low-dose atropine administration on dobutamine dose requirement in horses anesthetized with detomidine and halothane.** *American Journal of Veterinary Research* 58(12): 1436-1439. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, atropine, preanesthetic medication, detomidine, halothane, blood pressure, anesthesia, heart rate, carbon dioxide, blood gases, adverse effects.

White, N.A., A. Elward, K.S. Moga, D.L. Ward, and D.M. Sampson (2005). **Use of web-based data collection to evaluate analgesic administration and the decision for surgery in horses with colic.** *Equine Veterinary Journal* 37(4): 347-350. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, colic, surgical procedures, anesthesia, analgesia, data entry systems.

Wittern, C., D.A. Hendrickson, T. Trumble, and A. Wagner (1998). **Complications associated with administration of detomidine into the caudal epidural space in a horse.** *Journal of the American Veterinary Medical Association* 213(4): 516-518. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: horses, detomidine, conduction anesthesia, complications, dosage, recovery, halothane, case reports.

Wolf, L. (2002). **The role of complementary techniques in managing musculoskeletal pain in performance horses.** *Veterinary Clinics of North America, The Equine Practice* 18(1): 107-115. ISSN: 0749-0739.

NAL Call Number: SF951.V47

Descriptors: horses, performance, pain management, acupuncture, musculoskeletal system, therapy coordination.

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Behavior

- Aoyama, M., N. Yoshimura, S. Sugita, and R. Kusunose (2004). **Effects of used bedding straw and drying it in sunshine on lying behavior in stable horses.** *Journal of Equine Science* 15(3): 67-73. ISSN: 1340-3516.
NAL Call Number: SF277.J37
Descriptors: horses, resting behavior, effects of bedding material on lying behavior, used bedding, sun dried bedding.
- Ashley, F.H., A.E. Waterman Pearson, and H.R. Whay (2005). **Behavioural assessment of pain in horses and donkeys: application to clinical practice and future studies.** *Equine Veterinary Journal* 37(6): 565-575. ISSN: 0425-1644.
Descriptors: aggression, analgesics, animal behavior, anxiety, assessment, biological indicators, castration, catecholamines, colic, corticoids, depression, head, heart rate, hooves, hormone secretion, lameness, limbs, posture, reviews, stress grading, teeth, vocalization, pain, donkeys, horses.
- Autio, E. and M.L. Heiskanen (2005). **Foal behaviour in a loose housing/paddock environment during winter.** *Applied Animal Behaviour Science* 91(3-4): 277-288. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: horses, weanlings, behavior, effect of climate on behavior, effect of circadian rhythm on behavior, loose housing.
- Bachmann, I., L. Audige, and M. Stauffacher (2003). **Risk factors associated with behavioural disorders of crib-biting, weaving and box-walking in Swiss horses.** *Equine Veterinary Journal* 35(2): 158-163. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, stable vices, abnormal behavior, risk factors for behavioral disorders.
- Bachmann, I., P. Bernasconi, R. Herrmann, M.A. Weishaupt, and M. Stauffacher (2003). **Behavioural and physiological responses to an acute stressor in crib-biting and control horses.** *Applied Animal Behaviour Science* 82(4): 297-311. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: horse welfare, stereotypic behavior, crib-biting, plasma cortisol concentration, heart rate, stress response.
- Bachmann, I. and M. Stauffacher (2002). **Pravalenz von Verhaltensstörungen in der Schweizer Pferdepopulation. [Prevalence of behavioural disorders in the Swiss horse population].** *Schweizer Archiv Fuer Tierheilkunde* 144(7): 356-368. ISSN: 0036-7281.
NAL Call Number: 41.8 SCH9
Descriptors: horses, behavioral disorders, stable vices, stereotypic behavior.
Language of Text: German with English, French and Italian summaries.

Notes: Special issue: *Sonderheft Pferd*.

- Berbish, E.A., I.M. Ghoneim, S.Z. Mousa, and M.Z. Attia (1996). **Effect of castration on sexual and aggressive behaviour in male horses.** *Veterinary Medical Journal* 44(2B): 535-539. ISSN: 1110-1423.
NAL Call Number: SF604.C13
Descriptors: horses, castration, sexual behavior, aggressive behavior, animal husbandry methods, behavior, gonadectomy, sterilization, surgical operations.
- Boureau, V. (2002). **Demarche semiologique dans les troubles comportementaux du cheval. [Symptomatological approach to behavioural problems in horses].** *Pratique Veterinaire Equine* 34(135): 7-12. ISSN: 0395-8639.
NAL Call Number: SF957.P7
Descriptors: horses, behavioral disorders, correction, symptomatology.
Language of Text: French with an English summary.
- Budzynski, M., Z. Somka, L. Sotys, and W. Krupa (1997). **Ocena etologiczna klaczy i zrebiat czystej krwi arabskiej na pastwisku z uwzglednieniem pobudliwosci nerwowej. [Ethological estimation of purebred Arabian fillies and foals on pasture based on nervous irritability].** *Annales Universitatis Mariae Curie Sklodowska Sectio EE Zootechnica (Poland)* 15: 185-190. ISSN: 0239-4243.
NAL Call Number: SF84.A56
Descriptors: horses, mares, foals, behavior patterns.
Language of Text: Polish with an English summary.
- Cairns, M.C., J.J. Cooper, H.P.B. Davidson, and D.S. Mills (2002). **Association in horses of orosensory characteristics of foods with their post-ingestive consequences.** *British Society of Animal Science* 75(2): 257-265. ISSN: 1357-7298.
NAL Call Number: SF1.A56
Descriptors: horses, feeding preference, nutrient content.
- Christensen, J.W., L.J. Keeling, and B.L. Nielsen (2005). **Responses of horses to novel visual, olfactory and auditory stimuli.** *Applied Animal Behaviour Science* 93(1-2): 53-65. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: fear responses, behavioral responses, heart rate, stallions, food rewards, test arena, presentation of novel stimuli.
- Christensen, J.W., J. Ladewig, E. Sondergaard, and J. Malmkvist (2002). **Effects of individual versus group stabling on social behaviour in domestic stallions.** *Applied Animal Behaviour Science* 75(3): 233-248. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: horses, stallions, social interaction, behavior, aggressive behavior.
- Christensen, J.W., T. Zharkikh, J. Ladewig, and N. Yasinetskaya (2002). **Social behaviour in stallion groups (*Equus przewalskii* and *Equus caballus*) kept under natural and domestic conditions.** *Applied Animal Behaviour Science* 76(1): 11-20. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: horses, stallions, Przewalski's horse, social behavior, domestic management.
- Christie, J.L., C.J. Hewson, C.B. Riley, M.A. McNiven, I.R. Dohoo, and L.A. Bate (2006). **Management factors affecting stereotypies and body condition score in nonracing horses in Prince Edward Island.** *Canadian Veterinary Journal* 47(2): 136-143.
Descriptors: equine welfare, management practices, body condition score, stereotypic behavior, vices.
- Clarke, J.V., C.J. Nicol, R. Jones, and P.D. McGreevy (1996). **Effects of observational learning on food selection in horses.** *Applied Animal Behaviour Science* 50(2): 177-184. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: horses, learning, behavior patterns, feeding preferences.

- Clement, F. and E. Barrey (1995). **Fluctuations de la fréquence chez le cheval au repos: (2) facteurs de variation biologiques liés au profil comportemental.** [Heart rate fluctuations in the horse at rest: biological factors of variation related to behavioural patterns]. *Comptes Rendus De L' Academie Des Sciences Serie III, Sciences De La Vie* 318(8): 867-872. ISSN: 0764-4469.
Descriptors: horses, heart rate, spectral density, sex, age, breed, variations.
Language of Text: French with an English summary.
- Cooper, J.J. and M.J. Albentosa (2005). **Behavioural adaptation in the domestic horse: Potential role of apparently abnormal responses including stereotypic behaviour: Adaptability of sport horses to stressful conditions.** *Livestock Production Science* 92(2): 177-182. ISSN: 0301-6226.
Online: <http://www.sciencedirect.com/science/article/B6T9B-4DXSRG5-1/2/f7cf94936a7a352db78ce1cc8dfd936c>
NAL Call Number: SF1.L5
Descriptors: behavioral adaptation to environmental challenges, abnormal behavior, stable vices, horses, stereotypic behavior, adaptive responses.
- Cooper, J.J., N. McCall, S. Johnson, and H.P.B. Davidson (2005). **The short-term effects of increasing meal frequency on stereotypic behaviour of stabled horses.** *Applied Animal Behaviour Science* 90(3-4): 351-364. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: feeding frequency, stereotyped behavior, feed concentrates.
- Cooper, J.J., L. McDonald, and D.S. Mills (2000). **The effect of increasing visual horizons on stereotypic weaving: implications for the social housing of stabled horses.** *Applied Animal Behaviour Science* 69(1): 67-83. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: horses, stable vices, weaving, abnormal behavior, housing, housing design.
- Cooper, J. and P. McGreevy (2002). **Stereotypic behaviour in the stabled horse: Causes, effects and prevention without compromising horse welfare.** In: N. Waran (Editor), *The Welfare of Horses*, Animal Welfare, Kluwer Academic Publishers: Dordrecht, Netherlands, p. 99-124. ISBN: 1402007663.
NAL Call Number: SF285.3.W43 2002
Descriptors: horses, behavior, housing, stable vices, abnormal behavior, nutrition, animal welfare.
- Crowell Davis, S.L. and J.W. Weeks (2005). **Maternal behaviour and mare-foal interaction.** In: D.S. Mills and S.M. McDonnell (Editors), *The Domestic Horse: The Evolution, Development and Management of Its Behaviour*, Cambridge University Press: Cambridge, UK, p. 126-138. ISBN: 0521814146 (hardback); 0521891132 (paperback).
NAL Call Number: SF281.D66 2005
Descriptors: horses, mares, foals, behavior, maternal behavior.
- De Aluja, A.S. (1998). **The welfare of working equids in Mexico.** *Applied Animal Behaviour Science* 59(1-3): 19-29. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: Mexican subsistence agriculture, horses, donkeys, mules, working animals, harnesses, Mexico, animal welfare.
- Decuq, F., D. Micol, and H. Dubroeuq (1996). **Utilisation du système d' enregistrement automatique du comportement alimentaire "Ethosys" sur des troupeaux de bovins et de chevaux.** [Analysis of feeding behaviour of horses and cattle with a storage telemetry system "Ethosys"]. In: *Proceedings of the 3R Meeting "Rencontres Autour des Recherches sur les Ruminants", December 4, 1996-December 5, 1996, Paris, France*, Institut National de la Recherche Agronomique; Institut de l' Elevage: Paris, France, p. 74. ISBN: 2841480224.
Descriptors: horses, cattle, feeding behavior, telemetry, Ethosys system.

Language of Text: French.

Dodman, N.H., J.A. Normile, N. Cottam, M. Guzman, and L. Shuster (2005). **Prevalence of compulsive behaviors in formerly feral horses.** *International Journal of Applied Research in Veterinary Medicine* 3(1): 20-24. ISSN: 1542-2666.

Online: www.jarvm.com

NAL Call Number: SF601.J63

Descriptors: feral horses, domestication, compulsive behavior, behavioral disorders, confinement.

Doxey, D.L., S. Tothill, E.M. Milne, and Z. Davis (1995). **Patterns of feeding and behaviour in horses recovering from dysautonomia (grass sickness).** *The Veterinary Record* 137(8): 181-183. ISSN: 0042-4900.

NAL Call Number: 41.8 V641

Descriptors: horses, digestive disorders, nervous system diseases, animal diseases, feeding habits, behavior, behavior, disorders, functional disorders, organic diseases, grass-sickness, dysautonomia.

Du Preez, D.S. (2004). **Les problemes de comportement du cheval militaire. [Behavioural problems in the working horse].** *Revue Internationale Des Services De Sante Des Forces Armees* 77(1): 44-46, 48-49. ISSN: 0259-8582.

Descriptors: horse behavior, behavioral abnormalities, anxious behavior, performance horses, mental health, stable vices.

Dumont, B. and A. Boissy (1999). **Relations sociales et comportement alimentaire au paturage. [Impact of social relations on grazing behaviour in herbivores].** *Productions Animales (Paris)* 12(1): 3-10. ISSN: 0990-0632.

NAL Call Number: SF1.P77

Descriptors: herbivores, behavior, social behavior, grazing, feeding patterns.

Language of Text: French with an English summary.

Dyson, S. and D.M. Carson (2002). **Behavioural problems.** In: M.H. Hayes (Editor), *Veterinary Notes for Horse Owners*, Ebury Press: London, UK, p. 673-684. ISBN: 0091862779.

NAL Call Number: SF951.H382 2002

Descriptors: stable vices, horses, behavioral disorders, abnormal behavior, aggressive behavior, normal equine behavior, behavioral treatments.

Fader, C. and H.H. Sombraus (2004). **Das Ruheverhalten von Pferden in Offenlaufställen. [The resting behaviour of horses in loose housing systems].** *Tierärztliche Umschau* 59(6): 320-327. ISSN: 0049-3864.

NAL Call Number: 41.8 T445

Descriptors: horses, behavior, housing systems, loose housing, group housing, age variation, breed variation, social hierarchy, animal welfare.

Language of Text: German with an English summary.

Falewee, C., E. Gaultier, C. Lafont, L. Bougrat, and P. Pageat (In Press). **Effect of a synthetic equine maternal pheromone during a controlled fear-eliciting situation.** *Applied Animal Behaviour Science* ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses under saddle, behavior, stress, fear, pheromones, Equine Appeasing Pheromone behavior, fear reactions, heart rate.

Gill, A.M., A. Parker, S. Leak, and L.M. Lawrence (1997). **Effects of meal feeding frequency and roughage availability on behaviors of stabled horses.** In: *Proceedings of the 15th Equine Nutrition and Physiology Symposium, May 28, 1997-May 31, 1997, Fort Worth, Texas, USA*, Equine Nutrition & Physiology Society Publications: Savoy, USA, p. 404-405.

Descriptors: horses, behavior, meal frequency, roughage.

Gindl, G. (1995). **Selektives Verhalten der Nutz- und Wildtiere bei der Futteraufnahme sowie deren Einfluss auf den Pflanzenbestand. [Selective grazing behaviour of domestic and wild animals and their influence on botanical composition].** In: *Landwirtschaft und Naturschutz - Gemeinsam erhalten für die Zukunft*

Expertentagung, October 19, 1995-October 20, 1995, BAL Gumpenstein, Bundesanstalt für Alpenländische Landwirtschaft Gumpenstein: Irnding, Austria, p. 51-55.

Descriptors: horses, heifers, sheep, goats, dairy cattle, red deer, fallow deer, grazing behavior, grazing preferences.

Language of Text: German.

Grauvogl, A. (1996). **Behaviour of horses in paddocks.** *Tieraerztliche Umschau* 51(10): 614-616, 619-621. ISSN: 0049-3864.

NAL Call Number: 41.8 T445

Descriptors: horses, animal welfare, behavior, stress, outdoor housing systems, pasture, paddock, fencing.

Language of Text: German.

Harewood, E.J. and C.M. McGowan (2005). **Behavioral and physiological responses to stabling in naive horses.** *Journal of Equine Veterinary Science* 25(4): 164-170. ISSN: 0737-0806.

Descriptors: behavior, housing systems, confinement, isolation, individual housing, salivary cortisol concentration, behavioral indices, heart rate.

Harris, P. (2005). **Nutrition, behaviour and the role of supplements for calming horses: the veterinarian's dilemma.** *Veterinary Journal* 170(1): 10-11. ISSN: 1090-0233.

NAL Call Number: SF601.V484

Descriptors: horses, behavior, nutrition, veterinary medicine, dietary supplements, stress, calming methods.

Heleski, C.R., A.C. Shelle, B.D. Nielsen, and A.J. Zanella (2002). **Influence of housing on weanling horse behavior and subsequent welfare.** *Applied Animal Behaviour Science* 78(2/4): 291-302. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: foals, weaning, animal housing, stalls, group size, paddocks, animal behavior, androstanes, feces composition, physical activity, rest, abnormal behavior, animal welfare, grouphousing.

Notes: In the special issue: *Equine Behavior* edited K. Houpt and R. Rudman.

Henderson, J.V., N.K. Waran, and R.J. Young (1996). **The effect of an operant foraging device (The modified "Edinburgh Foodball") on the performance of stereotypic behaviour in the stabled horse.** In: *Proceedings of the 30th International Congress of the International Society for Applied Ethology, August 14, 1996-August 17, 1996, Guelph, Ontario, Canada, p. 98.* ISBN: 0889554528.

NAL Call Number: SF756.7.I57 1996

Descriptors: horses, abnormal behavior, enrichment, animal welfare.

Notes: Abstract of a poster presented at the meeting.

Henry, S., D. Hemery, M. Richard, and M. Hausberger (2005). **Human-mare relationships and behaviour of foals toward humans.** *Applied Animal Behaviour Science* 93(3-4): 341-362. ISSN: 0168-1591.

Descriptors: foals, mares, human-horse relationship, mare-foal influence, effects of handling, behavior.

Hoffman, R.M., D.S. Kronfeld, J.L. Holland, and K.M. Greiwe Crandell (1995). **Prewaning diet and stall weaning method influences on stress response in foals.** *Journal of Animal Science* 73(10): 2922-2930. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, foals, Thoroughbreds, weaning stress, pasture, hay, concentrates, effects of diet, weaning, plasma ascorbate concentration, serum cortisol, adrenocorticotrophic hormone, behavior.

Holland, J.L., D.S. Kronfeld, and T.N. Meacham (1996). **Behavior of horses is affected by soy lecithin and corn oil in the diet.** *Journal of Animal Science* 74(6): 1252-1255. ISSN: 1525-3163.

NAL Call Number: 49 J82

Descriptors: dietary fats, tractibility of horses, behavioral observations, pedometer, reactivity, reduction in activity and reactivity of horses.

Houpt, K.A. (1998). **[Animal behaviour problems in companion animals. Diagnosis and treatment in practice].**

Journal of Veterinary Medicine 51(7): 571-575. ISSN: 0447-0192.

Descriptors: horses, dogs, cats, abnormal behavior.

Language of Text: Japanese.

Hovell, G.J.R. (1998). **Welfare considerations when attaching animals to vehicles.** *Applied Animal Behaviour Science* 59(1-3): 11-17. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: draught horse welfare, harness injuries due to improper fit, traction efficiency, Middle East.

Hurtgen, J.P. (1997). **Libido and mating behaviour problems in stallions.** In: *Equine Reproduction, July 21, 1997- July 25, 1997, Manly Pacific Parkroyal Hotel, Manly, New South Wales, Australia*, Australian Equine Veterinary Association: Artarmon, N.S.W., Australia, p. 39-46. ISBN: 0646314793.

NAL Call Number: SF291.E66 1997

Descriptors: horses, stallions, behavior, behavioral challenges, aggression, mating behavior.

Jahiel, J. (2004). **The Horse Behavior Problem Solver: Your Questions Answered About How Horses Think, Learn, and React**, Storey Publishers: North Adams, Massachusetts, USA, 336 p. ISBN: 1580175252; 1580175244 (paperback).

NAL Call Number: SF281.J352004

Descriptors: horses, behavior, horsemanship, development of behavior problems, behavioral solutions, natural behavior.

Jeziarski, T., Z. Jaworski, and A. Gorecka (1999). **Effects of handling on behaviour and heart rate in Konik horses: comparison of stable and forest reared youngstock.** *Applied Animal Behaviour Science* 62(1): 1-11. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, temperament, training of animals, foals, handling, tameness, feral herds, age differences, heart rate, sex differences, sires.

Johnson, N.N., H.A. Brady, C.S. Whisnant, and P.A. LaCasha (1998). **Effects of oral altrenogest on sexual and aggressive behaviors and seminal parameters in young stallions.** *Journal of Equine Veterinary Science* 18(4): 249-253. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: stallions, oral administration, sexual behavior, aggressive behavior, semen characters, liveweight, testes, size, body condition, spermatozoa, abnormalities, sexual reproduction, sex hormones.

Notes: Meeting Information: Paper presented at the Equine Nutrition and Physiology Society Annual Symposium, May 28-31, 1997, Fort Worth, Texas.

Johnson, K.G., J. Tyrrell, J.B. Rowe, and D.W. Pethick (1998). **Behavioural changes in stabled horses given nontherapeutic levels of virginiamycin.** *Equine Veterinary Journal* 30(2): 139-143. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: behavior, diet, virginiamycin, horses, supplements, abnormal behavior, hay, concentrates, fermentation, medicated feed, acidosis, antibiotics, behavior, disorders, feeds, metabolic disorders, roughage.

Kawai, M., H. Hisano, Y. Yabu, N. Yabu, and S. Matsuoka (2004). **Effects of fallen snow on the voluntary intake and grazing behavior of Hokkaido native horses in winter woodland with underlying *Sasa senanensis*.** *Animal Science Journal* 75(5): 435-440. ISSN: 1344-3941.

Descriptors: grazing behavior, seasonal variation, effect of snowfall, feed intake, feed digestibility.

Keeling, L. (1996). **Social behaviour of horses.** *Allmaent Veterinaermoete*: 47-50. ISSN: 0281-5818.

Descriptors: horses, social behavior, communication between animals, behavior, dominance.

Keeling, L.J. and H.W. Gonyou (Editors) (2001). **Social Behaviour in Farm Animals**, CABI Pub.: New York, New York, USA, 406 p. ISBN: 0851993874.

NAL Call Number: SF756.7.S58 2001

Descriptors: farm animals, pigs, domestic birds, sheep, horses, fish, cattle, animal welfare, management techniques, social behavior, species specific behavior.

Kennedy, M.A. (2004). **How to stop aggression and other behavior problems in horses using an electronic collar.** In: *Proceedings of the 50th Annual Convention of the American Association of Equine Practitioners, December 4, 2004-December 8, 2004, Denver, Colorado, USA*, p. 425-427.

Online: <http://www.aaep.org>

Descriptors: abnormal behavior, aggression, animal behavior, equipment, techniques, vices, horses.

Ladewig, J. (2005). **Of mice and men: Improved welfare through clinical ethology.** *Applied Animal Behaviour Science* 92(3): 183-192. ISSN: 0168-1591.

Online: <http://www.sciencedirect.com/science/article/B6T48-4GCXJG1-1/2/d81b8c1aec95a3906770d2e2b5caf25>

NAL Call Number: QL750.A6

Descriptors: domestic animal welfare, behavior problems, behavior therapy, clinical ethology, behavior practitioners.

Notes: Meeting Information: International Society for Applied Ethology Special Issue, 2003 - A Selection of Papers from the 37th International Congress Abano Terme, Italy, June 2003.

Lamoot, I., C. Vandenberghe, D. Bauwens, and M. Hoffmann (2005). **Grazing behaviour of free-ranging donkeys and Shetland ponies in different reproductive states.** *Journal of Ethology* 23(1): 19-27. ISSN: 0289-0771.

Online: <http://springerlink.metapress.com/link.asp?id=105357>

NAL Call Number: QL750.J68

Descriptors: ponies, Shetland ponies, donkeys, foraging behavior, lactation, pregnancy, grazing preference.

Lansade, L., M. Bertrand, and M.F. Bouissou (2002). **Effet de manipulations neonatales et eu moment du sevrage sur le comportement des poulains. [Effect of neonatal handling and at the moment of weaning on the behaviour of foals].** In: *Journee de la Recherche Equine, February 27, 2002*, Les Haras Nationaux Direction du Developpement: Paris, France, Vol. 28, p. 71-81.

Descriptors: horses, foal development, effects of handling, behavior, imprinting, weaning, Welsh, neonatal handling, effects on manageability and fear, duration of handling effects.

Language of Text: French with an English summary.

Lebelt, D. (1999). **Verhaltensprobleme. [Behavioural problems in horses].** *Handbuch Pferdepraxis*: 185-192.

Descriptors: horses, stable vices, abnormal behavior, stress, stereotypic behavior, aggressive behavior, mating behavior.

Language of Text: German.

Lebelt, D. (1998). **A lovak sztereotip magatartaszavarai. Okok es terapias lehetosegek. [Stereotypic behavioural disorders in horses: principles and therapeutic approaches].** *Magyar Allatorvosok Lapja* 120(10): 582-590. ISSN: 0025-004X.

NAL Call Number: 41.8 V644

Descriptors: abnormal behavior, therapy, vices, animal behavior, horses.

Language of Text: Hungarian.

Lebelt, D. (Need translated title) (1998). **Problemverhalten Beim Pferd. [Problem Behavior With the Horse].** F. Enke: Stuttgart, 115 p. ISBN: 3432296118.

NAL Call Number: SF281.L42 1998

Descriptors: therapy, horse behavior, abnormal behavior, stable vices, horse psychopathology, headshaking, cribbing, stereotypic behavior, aggression, abnormal sexual behavior, psychotropic drugs, prevention of behavior problems.

Language of Text: German.

Lehmann, K., E. Kallweit, and F. Ellendorff (2006). **Social hierarchy in exercised and untrained group-housed horses--a brief report.** *Applied Animal Behaviour Science* 96(3-4): 343-347. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: geldings, social dominance, group housing, exercise, aggression.

Lopez Oliva, M., G. Gonzalez, P. Corbeira, H. Amusquibar, V. Simiani, and G. Gutierrez (1999). **Manifestaciones conductuales indeseables en los equinos deportivos sometidos a exigencias de manejo, entrenamiento y competicion.** [Undesirable behaviours in sport horses subject to the rigors of management, training and competition]. *Revista De Medicina Veterinaria Buenos Aires* 80(2): 125-128. ISSN: 0325-6391.

Descriptors: horses, performance, behavior, resting behavior, abnormal behavior, stable vices, stress, stereotypic behavior.

Language of Text: Spanish.

Luescher, A., D.B. McKeown, and H. Dean (1996). **A cross-sectional study on compulsive behaviour (stable vices) in horses.** In : *Proceedings of the 30th International Congress of the International Society for Applied Ethology, August 14, 1996-August 17, 1996, Guelph, Ontario, Canada*, p. 22.

NAL Call Number: SF756.7.I57 1996

Descriptors: horses, abnormal behavior, age, breed differences.

Notes: Abstract of a paper presented.

Marinier, S.L. and A.J. Alexander (1995). **Coprophagy as an avenue for foals of the domestic horse to learn food preferences from their dams.** *Journal of Theoretical Biology* 173(2): 121-124.

Descriptors: horses, coprophagia, foals, feeding preferences, feces, behavior, excreta, feeding habits, horses, young animals, learning.

Marsden, D. (2002). **A new perspective on stereotypic behaviour problems in horses.** *In Practice* 24(10): 558-569. ISSN: 0263-841X.

NAL Call Number: SF601.I4

Descriptors: horses, stable vices, abnormal behavior, animal welfare, literature reviews.

Mattiello, S. (2001). **Il comportamento sociale degli ungulati.** [Social behaviour of ungulates]. *O&DV Obiettivi e Documenti Veterinari (Italy)* 22(6): 15-18. ISSN: 0392-1913.

NAL Call Number: QL750.E82

Descriptors: horses, goats, deer, sheep, pigs, literature reviews, social behavior.

Language of Text: Italian.

Mcafee, L.M., D.S. Mills, and J.J. Cooper (2002). **The use of mirrors for the control of stereotypic weaving behaviour in the stabled horse.** *Applied Animal Behaviour Science* 78(2-4): 159-173. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, stable vices, weaving, stereotypic behavior, environmental enrichment, management practices, social isolation, animal welfare.

McBride, S.D. and L. Long (2001). **Management of horses showing stereotypic behaviour, owner perception and the implications for welfare.** *The Veterinary Record* 148(26): 799-802. ISSN: 0042-4900.

NAL Call Number: 41.8 V641

Descriptors: horses, stereotypic behavior, stable vices, performance, management practices, isolation, surveys, animal welfare.

McDonnel, S. (1999). **Reproduction de la jument: comportement normal et pathologique.** [Breeding in mares: normal and abnormal behaviour]. *Pratique Veterinaire Equine* 31(124): 427-432. ISSN: 0395-8639.

NAL Call Number: SF957.P7

Descriptors: horses, mares, breeding, estrous cycle, behavior, endocrine system.

Language of Text: French with an English summary.

McDonnell, S.M. (2003). **A Practical Guide to Horse Behavior: The Equid Ethogram**, Eclipse Press: Lexington, Kentucky, USA, 375 p. ISBN: 1581500904.

NAL Call Number: SF281.M33 2003

Descriptors: horses, behavior, management practices, stereotypic behavior, ethogram.

McDonnell, S. (1999). *Understanding Horse Behavior: Your Guide to Horse Health Care and Management*, Horse Health Care Library, Blood-Horse, Inc.: Lexington, KY, 99 p. ISBN: 1581500173.

Descriptors: ethogram, equine behavior, stable vices, management practices, stereotypic behavior, behavioral treatments, prevention of abnormal behavior, handbook for horse owners.

McDonnell, S.M. and A. Poulin (2002). **Equid play ethogram**. *Applied Animal Behaviour Science* 78(2-4): 263-290. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: play behavior, horses, ethogram, ponies, zebras, donkeys, Przewalski horses.

McGreevy, P. (Editor) (2004). *Equine Behavior: A Guide for Veterinarians and Equine Scientists*, Saunders: London, United Kingdom, 369 p. ISBN: 0702026344 .

Descriptors: free-ranging horses, horse behavior, management, training of horses, stable vices, perception, learning, social behavior and communication, feeding and ingestive behavior, handling and transportation.

McGreevy, P.C. (1997). **Do stabled horses cope?** *Journal of Biological Education* 31(3): 207-211. ISSN: 0021-9266.

Descriptors: horses, behavior, stable vices, performance, stereotypic behavior, housing, environmental factors, management practices, animal welfare.

McGreevy, P.D., P.J. Cripps, N. French, L.E. Green, and C.J. Nicol (1995). **Management factors associated with stereotypic and redirected behaviour in the Thoroughbred horse**. *Equine Veterinary Journal* 27(2): 86-91. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, racehorses, Thoroughbreds, animal behavior, abnormal behavior, risk, animal husbandry, stables, surveys, statistical analysis, stereotypic behavior.

McGreevy, P.D., N.P. French, and C.J. Nicol (1995). **The prevalence of abnormal behaviours in dressage, eventing and endurance horses in relation to stabling**. *The Veterinary Record* 137(2): 36-37. ISSN: 0042-4900.

NAL Call Number: 41.8 V641

Descriptors: horses, vices, incidence, endurance, time, stables, dressage horses, event horses.

McGreevy, P. and A. McLean (2005). **Behavioural problems with the ridden horse**. In: D.S. Mills and S.M. McDonnell (Editors), *The Domestic Horse: The Evolution, Development and Management of Its Behaviour*, Cambridge University Press: Cambridge, UK, p. 196-211. ISBN: 0521814146 (hardback); 0521891132 (paperback).

NAL Call Number: SF281.D66 2005

Descriptors: horses, stable vices, domestication, abnormal behavior, stable management, horseback riding, human-animal relationship, evolutionary biology.

McLean, A.N. (2004). **Short-term spatial memory in the domestic horse**. *Applied Animal Behaviour Science* 85(1-2): 93-105. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: equine memory, object permanence, feed goal, choice tests, recall abilities, effects of reinforcement delays during training.

Medica, D.L., M.J. Hanaway, S.L. Ralston, and M.V.K. Sukhdeo (1996). **Grazing behavior of horses on pasture: predisposition to strongylid infection?** *Journal of Equine Veterinary Science* 16(10): 421-427. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, pasture, grazing, behavior, *Strongylus vulgaris*, parasite predisposition.

Mertens, P.A. and N.H. Dodman (1996). **Die Diagnose von Verhaltens-Problemen bei Hund, Katze, Pferd und Vogel: Charakteristika von 323 Fallen (Juli 1994-Juni 1995)**. [The diagnosis of behavioral problems in

dogs, cats, horses and birds: characteristics of 323 cases (July 1994-June 1995). Part II. Cats, horses and birds]. *Kleintierpraxis* 41(4): 259-270. ISSN: 0023-2076.

NAL Call Number: 41.8 K67

Descriptors: horses, cats, dogs, birds, abnormal behavior, vices, aggressive behavior, stereotypic behavior, cribbing, self mutilation.

Language of Text: German with an English summary.

Miller, R.M. (1996). **Behavior of the horse: restraint.** *Journal of Equine Veterinary Science* 16(9): 366-371. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, restraint of animals, immobilization, veterinary equipment, animal behavior, twitches.

Mills, D.S. (2001). **An approach to behaviour problems in the horse.** *Ippologia* 12(4): 43-52. ISSN: 1120-5776.

Descriptors: horses, behavior correction, abnormal behavior, vices.

Language of Text: English with an Italian summary.

Mills, D.S. and K. Davenport (2002). **The effect of a neighbouring conspecific versus the use of a mirror for the control of stereotypic weaving behaviour in the stabled horse.** *British Society of Animal Science* 74(1): 95-101. ISSN: 1357-7298.

NAL Call Number: SF1.A56

Descriptors: horses, abnormal behavior, stable vices, weaving, animal welfare, housing conditions, environmental enrichment.

Mills, D.S. and S.M. McDonnell (Editors) (2005). **The Domestic Horse: The Evolution, Development and Management of Its Behaviour,** Cambridge University Press: Cambridge, UK, 249 p. ISBN: 0521814146 (hardback); 0521891132 (paperback).

NAL Call Number: SF281.D66 2005

Descriptors: rider-horse relationships, equine communication, sexual behavior of horses, mare-foal interactions, learning capabilities, repetitive movement problems, feral behavior, domestication, environmental influence, social behavior, play behavior, animal welfare, stable vices.

Moons, C.P.H., K. Laughlin, and A.J. Zanella (2005). **Effects of short-term maternal separations on weaning stress in foals.** *Applied Animal Behaviour Science* 91(3-4): 321-335. ISSN: 0168-1591.

Online: <http://www.sciencedirect.com/science/article/B6T48-4F157KH-1/2/1046e0707d1d2c055c87e5f040115223>

NAL Call Number: QL750.A6

Descriptors: weaning process, maternal behavior, foal behavior, gender differences, stress-coping strategies, salivary cortisol, heart rate, locomotor activities.

Ninomiya, S., S. Sato, R. Kusunose, T. Mitumasu, and Y. Obara (2007). **A note on a behavioural indicator of satisfaction in stabled horses.** *Applied Animal Behaviour Science* 106(1-3): 184-189 ISSN: 0168-1591.

Online: <http://www.sciencedirect.com/science/article/B6T48-4KF780J-1/2/683436b05453d125fda343c969987d51>

NAL Call Number: QL750.A6

Descriptors: stabled horses, stallions, geldings, behavioral measures of eating satisfaction, operant response test, standing-sleep behavior, welfare indications.

Normando, S., E. Canali, V. Ferrante, and M. Verga (2002). **Behavioral problems in Italian saddle horses.** *Journal of Equine Veterinary Science* 22(3): 117-120. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, behavior problems, vices, horse riding, incidence, traits, animal husbandry, training of animals, Italy, riding style, equestrian discipline.

Pell, S.M. and P.D. McGreevy (1999). **Prevalence of stereotypic and other problem behaviours in Thoroughbred horses.** *Australian Veterinary Journal* 77(10): 678-679. ISSN: 0005-0423.

NAL Call Number: 41.8 Au72

Descriptors: horses, Thoroughbreds, stereotypic behavior, abnormal behavior, stable vices, diagnostic methods.

Peters, D.F., J.B. Erfle, and G.T. Slobojan (1998). **Aggressive behavior associated with the use of xylazine and detomidine.** In: *Proceedings from the Annual Convention of the American Association of Equine Practitioners*, December 6, 1998-December 9, 1998, Baltimore, MD, Vol. 44, p. 284-286.

NAL Call Number: SF601.A46

Descriptors: horses, osteoarthritis.

Prest, V., S. Lieb, and E.A. Ott (1997). **Effects of novel objects on tail chewing behavior in horses in confinement.** In: *Proceedings of the Fifteenth Equine Nutrition and Physiology Symposium, May 28, 1997, Fort Worth, Texas, USA*, Equine Nutrition & Physiology Society Publications: Savoy, USA, p. 334.

Descriptors: horses, tail chewing, abnormal behavior, behavioral correction methods, environmental enrichment.

Pritchard, J.C., A.C. Lindberg, D.C.J. Main, and H.R. Whay (2005). **Assessment of the welfare of working horses, mules and donkeys, using health and behaviour parameters.** *Preventive Veterinary Medicine* 69(3-4): 265-283. ISSN: 0167-5877.

Online: <http://www.sciencedirect.com/science/article/B6TBK-4FPX2GR-1/2/cfee4efe4a23876d42e716f61c52c0c7>

NAL Call Number: SF601.P7

Descriptors: working animals, developing countries, working horses, mules and donkeys, welfare intervention strategy, draught animals.

Richter, W. (1999). **Wertmindernde Verhaltensmuster. [Behavioural patterns that diminish the value of horses].** In: O. Dietz and B. Huskamp (Editors), *Handbuch Pferdepraxis*, p. 193-198. ISBN: 3432292627.

Descriptors: horses, abnormal behavior, stable vices.

Language of Text: German.

Saslow, C.A. (2002). **Understanding the perceptual world of horses.** *Applied Animal Behaviour Science* 78(2-4): 209-224. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: equine perception, olfaction, hearing, pain perception, touch, animal training, vision, sensory-based cognition, tactile sensitivity.

Seaman, S.C., H.P.B. Davidson, and N.K. Waran (2002). **How reliable is temperament assessment in the domestic horse (*Equus caballus*)?** *Applied Animal Behaviour Science* 78(2-4): 175-191. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: temperament testing, recording of behavior, comparison of three test types, arena test, response to a person, response to an object, consistency of responses, active or passive copers, individual responses, consistency of open-field arena test.

Sevi, A., D. Casamassima, N. Marinelli, and R. Milano (1999). **Valutazione del comportamento e del benessere in cavalli da sella allevati in scuderia con diverso numero di accessi ai paddock. [Behaviour and welfare assessment in stabled horses having a different number of accesses to paddocks].** *Zootecnica e Nutrizione Animale* 25(3): 137-145. ISSN: 0390-0487.

NAL Call Number: SF1.Z6

Descriptors: horses, behavior, blood chemistry, housing systems, pasture access, exercise, stereotypic behaviors, animal welfare.

Language of Text: Italian with an English summary.

Sighieri, C., D. Tedeschi, C. de Andreis, L. Petri, and P. Baragli (2003). **Behaviour patterns of horses can be used to establish a dominant-subordinate relationship between man and horse.** *Animal Welfare* 12(4): 705-708. ISSN: 0962-7286.

NAL Call Number: HV4701.A557

Descriptors: horses, behavior, handling, training techniques, dominance.

Notes: Meeting Information: Proceedings of the 2nd International Workshop on the Assessment of Animal Welfare at Farm and Group Level, University of Bristol, UK, 4-6 September 2002.

Simpson, B.S. (1998). **Behavior problems in horses: Cribbing and wood chewing.** *Veterinary Medicine* 93(11): 999-1004. ISSN: 8750-7943.

NAL Call Number: 41.8 M69

Descriptors: horses, abnormal behavior, behavior modification, stable vices, cribbing, wood chewing.

Sjoblom, M., T. Timonen, and L. Hanninen (2001). **Hevosten kayttaytymishairiot - kirjallisuuskatsaus. [Abnormal behaviour in the horse - a review of literature].** *Suomen Elainlaakarilehti* 107(1): 14-19. ISSN: 0039-5501.

NAL Call Number: 41.8 F49

Descriptors: horses, abnormal behavior, stable vices, therapy, literature reviews.

Language of Text: Finnish with an English summary.

Sondergaard, E. (2003). **The effect of social environment and handling on the behavioural and physical development of young horses.** *DIAS Report, Animal Husbandry*(55): 54.

Descriptors: horses, environmental factors, social housing, behavior, handling, development.

Language of Text: English with a Danish summary.

Sondergaard, E. and J. Ladewig (2004). **Group housing exerts a positive effect on the behaviour of young horses during training.** *Applied Animal Behaviour Science* 87(1-2): 105-118. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, social housing, behavior, environmental factors, training, handling, horse-human relationship.

Strand, S.C., S. Tiefenbacher, M. Haskell, T. Hosmer, S.M. McDonnell, and D.A. Freeman (2002). **Behavior and physiologic responses of mares to short-term isolation.** *Applied Animal Behaviour Science* 78(2-4): 145-157. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: effects of isolation versus a novel environment or separation from established herd, equine behavior, social isolation, novel environment, transportation, heart rate.

Swann, W.J. (2006). **Improving the welfare of working equine animals in developing countries.** *Applied Animal Behaviour Science* 100(1-2): 148-151. ISSN: 0168-1591.

Online: <http://www.sciencedirect.com/science/article/B6T48-4JWMT0K-1/2/51a9f8f26578f14f30db1b2112018ed7>

NAL Call Number: QL750.A6

Descriptors: working horses, developing countries, animal welfare, behavioral and health observations, assessment of risks contributing to poor welfare.

Tarantola, M., D. Bergero, and A. Rinetti (1998). **Lo stress del cavallo. Concetti generali e problemi comportamentali. [Horse stress. Stress-related behavioural problems].** *Summa (Italy)* 15(3): 13-18.

Abstract: The general consideration for welfare-related problems in animal husbandry has quickly grown up in the last period. Ethical reasons and the possible reduction in the different productions were the starting point for this interest. The aim of this work was to point out the present knowledge about neuroendocrine responses and main stressors for horses. Stress-related behavioural problems are also described.

Descriptors: horse behavior, stress, animal welfare, neuroendocrine responses to stress, abnormal behavior, dysregulation, melatonin, homeostasis, catecholamines, endorphins, vasopressin, prolactin, glucocorticoids, hormones, neurotransmitters.

Language of Text: Italian.

Tarantola, M., A. Schiavone, and D. Bergero (2001). **Problemi comportamentali nel cavallo. [Abnormal behaviour in saddle horses].** *O&DV Obiettivi e Documenti Veterinari (Italy)* 22(4): 53-59. ISSN: 0392-1913.

NAL Call Number: QL750.E82

Descriptors: horses, abnormal behavior, stable vices, management practices, stress, stress indicators, potassium.

Language of Text: Italian with an English summary.

Taylor, K.D., S. Cook, and D.S. Mills (2001). **A case-controlled study investigating health, management and behavioural features of horses commonly described as headshakers.** *Ippologia* 12(3): 29-37. ISSN: 1120-5776.

Descriptors: horses, abnormal behavior, respiratory system, alternative medicine, pain, management practices.

Language of Text: English with an Italian summary.

Thorne, J.B., D. Goodwin, M.J. Kennedy, H.P.B. Davidson, and P. Harris (2004). **Foraging enrichment for stabled horses: practicality and effects on behaviour.** *Animal Welfare* 13(Suppl.): 256. ISSN: 0962-7286.

NAL Call Number: HV4701.A557

Descriptors: horses, foraging enrichment, behavior, management practices, animal welfare.

Notes: Meeting Information: Universities Federation for Animal Welfare (UFAW) Symposium on Science in the Service of Animal Welfare, Edinburgh, UK; April 02-04, 2003.

Van Dierendonck, M.C., H. Sigurjonsdottir, B. Colenbrander, and A.G. Thorhallsdottir (2004). **Differences in social behaviour between late pregnant, post-partum and barren mares in a herd of Icelandic horses.** *Applied Animal Behaviour Science* 89(3/4): 283-297. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, mares, behavior, behavioral variation, dominant behavior.

Waiblinger, S., X. Boivin, V. Pedersen, M.V. Tosi, A.M. Janczak, E.K. Visser, and R.B. Jones (In Press). **Assessing the human-animal relationship in farmed species: A critical review.** *Applied Animal Behaviour Science* ISSN: 0168-1591.

Online: <http://www.sciencedirect.com/science/article/B6T48-4JG5F5S-1/2/e46b8ab917f6d16f95d8890f12f8bce4>

NAL Call Number: QL750.A6

Descriptors: human-animal relationships, farmed animals, comparison and validation of tests, welfare, ruminants, pigs, poultry, fur animals, horses.

Waran, N. (Editor) (2002). *The Welfare of Horses*, Animal Welfare, Kluwer Academic Publishers: Boston, Massachusetts, USA, 240 p. ISBN: 1402007663.

Descriptors: management systems, equine welfare, natural history of horses, effects of environment on behavior and welfare, sport horses, work horses, training.

Waran, N.K. (2001). **The social behaviour of horses.** In: L.J. Keeling and H.W. Gonyou (Editors), *Social Behaviour in Farm Animals*, CABI Publishing: New York, New York, USA, p. 247-274. ISBN: 0851993874.

NAL Call Number: SF756.7.S58 2001

Descriptors: horses, social behavior, stereotypic behavior, stable vices, communication, social dominance, hierarchy, herds, farm animals.

Winskill, L., N.K. Waran, C. Channing, and R. Young (1995). **Stereotypies in the stabled horse: causes, treatment and prevention.** *Current Science* 69(4): 310-316. ISSN: 0011-3891.

NAL Call Number: 475 SCI23

Descriptors: horses, stereotypic behavior, abnormal behavior, environmental factors, behavior correction.

Winskill, L.C., N.K. Waran, and R.J. Young (1996). **The effect of a foraging device (a modified 'Edinburgh Foodball') on the behaviour of the stabled horse.** *Applied Animal Behaviour Science* 48(1/2): 25-35. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, abnormal behavior, foraging, grazing, behavior patterns, enrichment, animal welfare, stables, stereotypies, enrichment devices.

Zeeb, K. and U. Schnitzer (1997). **Housing and training of horses according to their species-specific behaviour.** *Livestock Production Science* 49(2): 181-189. ISSN: 0301-6226.

NAL Call Number: SF1.L5

Descriptors: horses, housing, training, social needs, feeding practices, effects of climate, grooming, environmental factors, handling, horse-man relationship, effects of incorrect management practices.

Zeitler Feicht, M.H. and K. Lohmann (2004). **Horse Behaviour Explained: Origins, Treatment and Prevention of Problems**, Manson Pub.: London, 224 p. ISBN: 1840760370.

NAL Call Number: SF281.Z4513 2004

Descriptors: horse behavior, training of horses, behavioral disorders, stereotypic behavior, prevention of behavior problems, behavioral treatment.

Zeitler Feicht, M.H. and V. Prantner (2000). **Liegeverhalten von Pferden in Gruppenauslaufhaltung. [Lying resting behaviour of horses in loose housing systems with open yards].** *Archiv Fuer Tierzucht* 43(4): 327-335. ISSN: 0003-9438.

NAL Call Number: 49 AR23

Descriptors: horses, loose housing systems, behavior, social rank, resting behavior.

Language of Text: German with an English summary.

Behavior -- Web Resources

Havemeyer Equine Behavior Lab Home Page.

Online: <http://www3.vet.upenn.edu/labs/equinebehavior/Index.html>

Description: Includes a list of equine behavior references and internet links as well as information on current research. Also listed are clinics and classes on equine behavior offered by the University of Pennsylvania.

Horse Behavior Research.

Online: <http://www.ag.auburn.edu/ansc/ResPrograms/horse.html>

Description: List of links to articles on horse behavior research in the areas of crib-biting, reactivity, and equine learning. Research is conducted at the Horse Unit of Auburn University.

Horse Behaviour.

Online: <http://vein.library.usyd.edu.au/links/horses.html#behaviour>

Description: Links to various short articles on aspects of equine behavior including stress, vices, travel and racehorse behavior.

Pica in Horses.

Online: <http://www.usask.ca/wcvm/herdmed/applied-ethology/behaviourproblems/pica.html>

Description: Causes, treatment, and prevention of pica --the consumption of non-food substances.

Equine Behavior: Prey vs. Predator, Horse vs. Human. *Evans, P.*

Online: http://extension.usu.edu/files/publications/publication/Ag_Equine_2005-02.pdf

Description: This page highlights the behavioral similarities of humans to predators and horses to prey and emphasizes the importance of these behavioral roles in the human-horse relationship. The author also explains how to use this predator-prey behavioral relationship in handling and training.

Equine Vision and Its Effect on Behavior. *Evans, P.*

Online: http://extension.usu.edu/files/publications/publication/AG_Equine_2005-03.pdf

Description: Describes equine eye anatomy, field of vision, visual processing in the brain, and the effect of head position on vision as a means to explain certain equine behaviors.

Identifying Abnormal Equine Behavior and Vices. *Lawrence, L.A., N.L. Gates, and D.G. Bowers.*

Online: <http://cru.cahe.wsu.edu/CEPublications/eb1657/eb1657.html>

Description: Designed to assist individuals identify equine vices. Details the behavior, description, and cause of vices in six categories: fear, aggression, performance, metabolism, stall, and miscellaneous vices.

Training and Behavioural Rehabilitation in the Horse. *Waran, N. and R. Casey.*

Online: <http://www3.vet.upenn.edu/labs/equinebehavior/hvnwkshp/hv02/waran.htm>

Description: Cause, diagnosis, and treatment of behavioural problems in the domestic horse.

Horses Publications: The Basics of Equine Behavior. *Williams, C.*

Online: <http://www.rcrc.rutgers.edu/pubs/publication.asp?pid=FS525>

Description: Fact sheet with equine behavior explanations. Includes survival traits, senses, social structure, communication, and vices.

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Environmental Enrichment

Cooper, J.J., L. McDonald, and D.S. Mills (2000). **The effect of increasing visual horizons on stereotypic weaving: implications for the social housing of stabled horses.** *Applied Animal Behaviour Science* 69(1): 67-83. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, stable vices, weaving, abnormal behavior, housing, housing design.

Goodwin, D., H.P. Davidson, and P. Harris (2002). **Foraging enrichment for stabled horses: Effects on behaviour and selection.** *Equine Veterinary Journal* 34(7): 686-691. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Abstract: The restricted access to pasture experienced by many competition horses has been linked to the exhibition of stereotypic and redirected behaviour patterns. It has been suggested that racehorses provided with more than one source of forage are less likely to perform these patterns; however, the reasons for this are currently unclear. To investigate this in 4 replicated trials, up to 12 horses were introduced into each of 2 identical stables containing a single forage, or 6 forages for 5 min. To detect novelty effects, in the first and third trials the single forage was hay. In the second and fourth, it was the preferred forage from the preceding trial. Trials were videotaped and 12 mutually exclusive behaviour patterns compared. When hay was presented as the single forage (Trials 1 and 3), all recorded behaviour patterns were significantly different between stables; e.g. during Trial 3 in the 'Single' stable, horses looked over the stable door more frequently ($P < 0.001$), moved for longer ($P < 0.001$), foraged on straw bedding longer ($P < 0.001$), and exhibited behaviour indicative of motivation to search for alternative resources ($P < 0.001$) more frequently. When a previously preferred forage was presented as the single forage (Trials 2 and 4) behaviour was also significantly different between stables, e.g. in Trial 4 horses looked out over the stable door more frequently ($P < 0.005$) and foraged for longer in their straw bedding ($P < 0.005$). Further study is required to determine whether these effects persist over longer periods. However, these trials indicate that enrichment of the stable environment through provision of multiple forages may have welfare benefits for horses, in reducing straw consumption and facilitating the expression of highly motivated foraging behaviour.

Descriptors: access to pasture, abnormal behavior, racehorses, provision of multiple forages, enrichment of stable environment, stereotyped behavior, animal feed, animal welfare, equine housing, videotape recording, animal welfare.

Henderson, J.V., N.K. Waran, and R.J. Young (1997). **Behavioural enrichment for horses: the effect of foraging device (The "Equiball") on the performance of stereotypic behaviour in stabled horses.** In: *Proceedings of the First International Conference on Veterinary Behavioural Medicine, April 1, 1997-April 2, 1997, Birmingham, UK*, p. 204-208. ISBN: 0900767979.

NAL Call Number: QL750.I67 1997

Descriptors: horses, behavior, animal welfare, housing systems, environmental enrichment, vice prevention.

Haupt, K., M. Marrow, and M. Seeliger (2000). **A preliminary study of the effect of music on equine behavior.** *Journal of Equine Veterinary Science* 20(11): 691-737. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, behavior, music, stress remedies, animal welfare.

Mcafee, L.M., D.S. Mills, and J.J. Cooper (2002). **The use of mirrors for the control of stereotypic weaving behaviour in the stabled horse.** *Applied Animal Behaviour Science* 78(2-4): 159-173. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, stable vices, weaving, stereotypic behavior, environmental enrichment, management practices, social isolation, animal welfare.

Mills, D.S. and K. Davenport (2002). **The effect of a neighbouring conspecific versus the use of a mirror for the control of stereotypic weaving behaviour in the stabled horse.** *British Society of Animal Science* 74(1): 95-101. ISSN: 1357-7298.

NAL Call Number: SF1.A56

Descriptors: horses, abnormal behavior, stable vices, weaving, animal welfare, housing conditions, environmental enrichment.

Thorne, J.B., D. Goodwin, M.J. Kennedy, H.P.B. Davidson, and P. Harris (2005). **Foraging enrichment for individually housed horses: Practicality and effects on behaviour.** *Applied Animal Behaviour Science* 94(1-2): 149-164. ISSN: 0168-1591.

Online: <http://www.sciencedirect.com/science/article/B6T48-4FSX66P-1/2/e15238324191ec3ba3664c07b189de70>

NAL Call Number: QL750.A6

Descriptors: restricted forage diet, stereotypical behavior, gastric ulcers, colic, foraging enrichment, stabled horses, individual preferences, patch foraging behavior.

Winskill, L.C., N.K. Waran, and R.J. Young (1996). **The effect of a foraging device (a modified "Edinburgh Football") on the behaviour of the stabled horse.** *Applied Animal Behaviour Science* 48(1-2): 25-35. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: environmental enrichment, stabled horses, stereotypical behavior, foraging behavior, foraging device, Edinburgh Football, individually housed Standardbred horses.

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Housing

Alinovi, C.A., M.P. Ward, L.L. Couetil, and C.C. Wu (2003). **Detection of Salmonella organisms and assessment of a protocol for removal of contamination in horse stalls at a veterinary teaching hospital.** *Journal of the American Veterinary Medical Association* 223(11): 1640-1644. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: horses, horse housing, environmental contamination, Salmonella infection, disinfection procedure, bacteria management.

Autonell, S. and A. Claudio (1998). *Estudio comparado de la eficacia antihelmintica y tolerancia de moxidectina, en caballos estabulados y en pastoreo. [Comparative study of the antihelmintic efficiency and tolerance to moxidectin, in stabled and pastured horses]*. Dissertation, Concepcion Univ., Chillan (Chile). Fac. de Medicina Veterinaria: Chile. 42 p.

Descriptors: moxidectin, worming of horses, parasitoses, anthelmintics, grazing, restraint of animals, animal feeding, stabled versus pastured horses.

Language of Text: Spanish with English and Spanish summaries.

Notes: Thesis (Med Vet).

Beyer, S. (1998). *Konstruktion Und Überprüfung Eines Bewertungskonzeptes Fur Pferdehaltende Betriebe Unter Dem Aspekt Der Tiergerechtheit. [Procedure for Inspecting Premises Housing Horses]*, 135 p.

Descriptors: horses, horse housing, animal welfare, housing inspection.

Language of Text: German with an English summary.

Brommer, H. and M.M. Sloet Van Oldruitenborgh Oosterbaan (2001). **Iron deficiency in stabled Dutch warmblood foals.** *Journal of Veterinary Internal Medicine* 15(5): 482-485. ISSN: 0891-6640.

NAL Call Number: SF601.J65

Descriptors: horses, foals, blood composition, oral supplement, iron deficiency, management practices.

Brown, J.H., S. Pilliner and Z. Davies (2003). *Horse and Stable Management*, 4th edition, Blackwell Publishing: Ames, Iowa, USA, 432 p. ISBN: 1405100079.

NAL Call Number: SF285.3.B76 2003

Descriptors: horses, horses psychology, horse health, stable management.

Brown, J.H., V. Powell Smith, S. Pilliner, J.H. Brown and J.H. Brown (1996). *Horse and Stable Management, Incorporating Horse Care Omnibus*, 3rd edition, Blackwell Science: Cambridge, Massachusetts, USA, 470 p. ISBN: 0632041528.

NAL Call Number: SF285.3.B76 1996

Descriptors: horses, horses psychology, horses health, stables management.

Notes: Rev. ed. of *Horse and Stable Management*. 2nd ed. 1994.

- Budzinska Wrzesien, E. and R. Wrzesien (2005). **Optimization of classic horse stable in South Silesia.** In: *Animals and Environment, Vol. 2: Proceedings of the XIIth ISAH Congress on Animal Hygiene, September 4, 2005-September 8, 2005, Warsaw, Poland*, BEL Studio sp. z.o.o: Warsaw, Poland, p. 184-187. ISBN: 8389968363.
Descriptors: animal health, animal housing, environmental temperature, humidity, lighting, microclimate, stables, ventilation, horses.
- Buechner Maxwell, V., M. Murray, M. Crisman, W. Ley, G. Saunders, and A. Walton (1996). **Relationship of equine housing to large airway inflammation.** *Journal of Equine Veterinary Science* 16(11): 502-506. ISSN: 0737-0806.
NAL Call Number: SF951.J65
Descriptors: horse housing systems, respiratory disease, mucosal inflammation, environmental factors.
- Campbell, D.D. (Inventor) **Expandable corral for attachment to a horse trailer.** 2004). *Official Gazette of the United States Patent and Trademark Office Patents*, 1282 (1). ISSN: 0098-1133.
Online: <http://www.uspto.gov/patft/index.html>
Descriptors: corral apparatus, adjustable confinement, attaches to horse trailer, variable corral size.
- Cargill, C. (1999). **Reducing Dust in Horse Stables and Transporters: A Report**, Rural Industries Research and Development Corporation: Kingston, A.C.T., 21 p. ISBN: 0642578532.
NAL Call Number: SF285.35.C37 1999
Descriptors: stables, horse trailers, dust control.
- Casanueva, M.E., A. Berrios, R. Martinez, and A. Peredo (1995). **Acaros asociados a equinos estabulados. II. Caloglyphus berlesei (Michael) y Caloglyphus rhizoglyphoides (Zachvatkin). Primeros registros para Chile (Acari: Astigmata).** [Mites associated with stabled horses. II. *Caloglyphus berlesei* (Michael) and *Caloglyphus rhizoglyphoides* (Zachvatkin). First records for Chile (Acari: Astigmata)]. *Archivos De Medicina Veterinaria* 27(1): 119-121. ISSN: 0301-732X.
Descriptors: horses, housing, mites, geographical prevalence, *Caloglyphus berlesei*, *Caloglyphus*, Acari, Arachnida.
Language of Text: Spanish with an English summary.
- Chaya, L., E. Cowan, and B. McGuire (2006). **A note on the relationship between time spent in turnout and behaviour during turnout in horses (*Equus caballus*).** *Applied Animal Behaviour Science* 98(1-2): 155-160. ISSN: 0168-1591.
Online: <http://www.sciencedirect.com/science/article/B6T48-4H8FPHG-2/2/d6997d9871207de7b7499542de812139>
NAL Call Number: QL750.A6
Descriptors: behavior frequency during turnout, grazing frequency, welfare implications, effect of housing on behavior.
- Clay, J., D.E. Gelfand and N. Ringer (1999). **Renovating or Building a Small Barn for Your Horse**, Storey Books: Pownal, Vermont, USA, 32 p. ISBN: 1580172717.
NAL Call Number: TH4930.C58 1999
Descriptors: stables design and construction, barn remodeling for other uses, horses housing.
- David, D. and M. Sirbu (1998). **Echipamente pentru adaposturi de cabaline. [Equipment for horses stables].** *Agricultura Revista De Stiinta Si Practica Agricola* 7(2): 97-100. ISSN: 1221-5317.
Descriptors: horses, housing, equipment.
Language of Text: Romanian.
- Dunlea, A.P. and V.A. Dodd (1996). **Respirable dust control in a scale-model horse stable using filtration and mechanical ventilation.** *Canadian Agricultural Engineering* 38(3): 215-221. ISSN: 0045-432X.
NAL Call Number: 58.8 C164
Descriptors: animal housing, model systems, ventilation, filtration, dust control.

- Dunlea, A.P. and V.A. Dodd (1995). **Measurement of respirable dust levels in horse stables.** *Canadian Agricultural Engineering* 37(3): 205-209. ISSN: 0045-432X.
NAL Call Number: 58.8 C164
Descriptors: horses, housing, dust level, ventilation.
- Dwyer, R.M. (1995). **Disinfecting equine facilities.** In: H.A. McDaniel (Editor), *Disinfectants: Actions and Applications, Part Two*, Office International des Epizooties (OIE): Paris, France, p. 403-418. ISBN: 9290443685.
Descriptors: horses, housing, infection prevention, disinfection methods.
- Furst, A., J. Knubben, A. Kurtz, J. Auer, and M. Stauffacher (2006). **Pferde in Gruppenhaltung: Eine Betrachtung aus tierärztlicher Sicht unter besonderer Berücksichtigung des Verletzungsrisikos. [Group housing of horses: veterinary considerations with a focus on the prevention of bite and kick injuries].** *Pferdeheilkunde* 22(3): 254-258. ISSN: 0177-7726.
Descriptors: group housing systems, injury, risk factors, preventive measures, management practices, feeding methods, physiological requirements, welfare considerations.
Language of Text: German with an English summary.
- Greene, E.A. and J.F. Trott (2004). **The self-guided horse facility analysis: a proactive safety education tool for equine facilities [electronic resource].** *Journal of Extension* 42(6) ISSN: 1077-5315.
NAL Call Number: LC45.4.J682
Descriptors: horse riding, horsemanship, animal injuries, health promotion, health insurance.
- Harmon, J., M.S. Honeyman and B. Koenig (2004). **Hoop Barns for Horses, Sheep, Ratites, and Multiple Utilization,** Midwest Plan Service: Ames, Iowa, 7 p.
NAL Call Number: TH4930.H37 2004
Descriptors: animal housing design and construction, barns design and construction, multipurpose buildings design and construction.
- Hill, C. (2005). **Horsekeeping on a Small Acreage: Designing and Managing Your Equine Facilities**, 2nd edition, Storey Publishing: North Adams, MA, 308 p. ISBN: 1580176038; 158017535X (pbk.).
NAL Call Number: SF285.H55 2005
Descriptors: horses, housing, small farms.
- Hill, C. (2000). **Stablekeeping: A Visual Guide to Safe and Healthy Horsekeeping**, Storey Books: Pownal, Vermont, USA, 153 p. ISBN: 1580171753.
NAL Call Number: SF285.35.H56 2000
Descriptors: stable management, barn features, stalls, tack rooms, turnout areas, stable vices, prevention of behavioral problems, sanitation and pest control, hay, grain, feeding practices, water, safety, emergency preparedness.
- Hiney, K.M., B.D. Nielsen, and D. Rosenstein (2004). **Short-duration exercise and confinement alters bone mineral content and shape in weanling horses.** *Journal of Animal Science* 82(8): 2313-2320. ISSN: 0021-8812.
NAL Call Number: 49 J82
Descriptors: horses, weanlings, bone mass, housing, confinement, exercise protocol, skeletal strength, diagnostic techniques.
- Hoekstra, K.E., B.D. Nielsen, M.W. Orth, D.S. Rosenstein, H.C. Schott II, and J.E. Shelle (1999). **Comparison of bone mineral content and biochemical markers of bone metabolism in stall vs. pasture-reared horses.** *Equine Veterinary Journal*(Suppl. 30): 601-604. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, Arabian horses, housing systems, bone mineral content, biochemical markers, bone metabolism, serum osteocalcin concentration, pastures, stalls.
Notes: Meeting Information: Proceedings of the Fifth International Conference on Equine Exercise Physiology, Utsunomiya, Japan; 20-25 September 1998. *Equine Exercise Physiology* 5.

- Holcombe, S.J., C. Jackson, V. Gerber, A. Jefcoat, C. Berney, S. Eberhardt, and N.E. Robinson (2001). **Stabling is associated with airway inflammation in young arabian horses.** *Equine Veterinary Journal* 33(3): 244-249. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, yearlings, Arabian horses, pasture, stable, effect of housing on respiratory system, airway inflammation, evaluation techniques, pharyngeal lymphoid hyperplasia, guttural pouch inflammation, neutrophils, bronchoalveolar lavage fluid, soft palate displacement.
- Inoue, Y., K. Yamaguchi, T. Sawada, J.C. Rivero, and Y. Horii (2002). **Higher prevalence of anti-bornavirus antibodies in stabled than in feral horses in Japan.** *Equine Veterinary Journal* 34(7): 741-743. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, feral, domesticated, anti-bornavirus disease, epidemiological studies.
- Khan, G.K.M.A., O. Fauziah, and Ling OngEet (2005). **Energy dispersive X-ray microanalysis of dust particles in equine stable.** *Journal of Biological Sciences* 5(2): 233-235.
Online: <http://www.ansinet.org/jbs>
Descriptors: analysis, composition, dust, elements, particle size, particles, shape, stables, techniques, X radiation.
- Kornas, S., B. Nowosad, and M. Skalska (2004). **Prevalence of roundworms (*Parascaris equorum*) in horses housed in different management systems.** *Medycyna Weterynaryjna* 60(4): 412-414. ISSN: 0025-8628.
NAL Call Number: 41.8 M463
Descriptors: horses, *Parascaris equorum*, roundworms, management systems, housing systems, parasite prevention.
Language of Text: Polish.
- Langrova, I. (1999). **The importance of contaminated pastures and litter in stables for the infection with nematodes of family Strongylidae in horses on studfarm Xaverov.** *Helminthologia* 36(4): 241-249. ISSN: 0440-6605.
Descriptors: horses, epidemiological studies, parasitology, pasture contents, seasonality of pasture, housing contamination.
- Lee, C.E., N.K. Park, S.H. Jin, Y.J. Kim, D.H. Kang, and K.I. Kim (2002). **Changes in serum vitamin E and trace mineral levels and other blood parameters in growing Thoroughbred horses during the period of pasture grazing and stable feeding.** *Journal of Animal Science and Technology* 44(6): 719-726.
Descriptors: animal husbandry, agriculture, nutrition, alfalfa hay, blood parameters, grass hay, animal feed, pasture grazing, stable feeding.
- Malschitzky, E., A.P. Neves, R.M. Gregory, and R.C. Mattos (2005). **Reduzir o uso da cocheira reduz a incidencia de infeccoes por *Rhodococcus equi* em potros. [Reduction of stall use reduces the incidence of *Rhodococcus equi* infections in foals].** *A Hora Veterinaria* 24(144): 35-38. ISSN: 0101-9163.
Descriptors: horses, foals, effects of stabling, disease control, *Rhodococcus equi*.
Language of Text: Portuguese with English and French summaries.
- Martinsson, A. (1997). ***Olika Saett Att Utfodra Haestar i Loesdriftsystem. [Feeding Horses in Loose Housing]***, Foerdjupningsarbete - SLU, Enheten foer Hippologisk Hoegskoleutbildning (Sweden), Uppsala (Sweden), 12 p.
Descriptors: foals, hay, haylage, concentrates, drinking water, animal competition, extensive husbandry, animal feeding, animal husbandry methods, biological competition, extensive farming, farming systems, feeds, fermented products, horses, processed products, roughage, silage, water, young animals.
Language of Text: Swedish with English and Swedish summaries.
- Matsui, A., Y. Inoue, and Y. Asai (2003). **The effect of putting the bag with collecting feces and urea ("equine diaper") to the ammonia gases concentrate in horse's pen.** *Journal of Equine Science* 14(3): 75-79. ISSN:

1340-3516.

NAL Call Number: SF277.J37

Descriptors: horses, animal welfare, ammonia exposure, respiratory system, behavior, feeding behavior, management practices.

Matsui, K., Y. Morioka, and K. Takeda (2005). [**Changes of attitudes and body temperature in Kiso horses in the stall at night**]. *Bulletin of the Shinshu University Alpine Field Center*(3): 11-16. ISSN: 1348-7892.

Descriptors: horses, behavior, body temperature, resting behavior, movement patterns.

Language of Text: Japanese with an English summary.

Mcduffee, L.A., S.M. Stover, and K. Coleman (2000). **Limb loading activity of adult horses confined to box stalls in an equine hospital barn**. *American Journal of Veterinary Research* 61(3): 234-237. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, limb loading, effects of confinement, housing, environmental factors.

Meiswinkel, R., M. Baylis, and K. Labuschagne (2000). **Stabling and the protection of horses from *Culicoides bolitinos* (Diptera: Ceratopogonidae), a recently identified vector of African horse sickness**. *Bulletin of Entomological Research* 90(6): 509-515. ISSN: 0007-4853.

NAL Call Number: 421 B87

Descriptors: horses, *Culicoides*, *Culicoides imicola*, disease vectors, vector control, stables, fans, animal behavior, feeding habits, species differences, climatic factors, trapping, African horse sickness, protection, disease prevention, South Africa, entry behavior, exophily, endophily, vector exclusion.

Moncol, D.J. (1996). **Composting equine stall waste using shredded newsprint for bedding**. *Equine Practice* 18(8): 18-22. ISSN: 0162-8941.

NAL Call Number: SF951.E62

Descriptors: horses, bedding, management practices, housing, stall waste compost.

Muscatello, G., S. Gerbaud, C. Kennedy, J.R. Gilkerson, T. Buckley, M. Klay, D.P. Leadon, and G.F. Browning (2006). **Comparison of concentrations of *Rhodococcus equi* and virulent *R. equi* in air of stables and paddocks on horse breeding farms in a temperate climate**. *Equine Veterinary Journal* 38(3): 263-265. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: air quality, airborne infection, disease transmission, farms, paddocks, pneumonia, risk factors, stables, temperate climate, ventilation, virulence, horses, *Rhodococcus equi*.

Nardoni, S., F. Mancianti, M. Sgorbini, F. Taccini, and M. Corazza (2005). **Identification and seasonal distribution of airborne fungi in three horse stables in Italy**. *Mycopathologia* 160(1): 29-34. ISSN: 0301-486X.

NAL Call Number: 450 M994

Descriptors: air microbiology, fungal spores, fungi, seasonal variation, animal housing, species diversity, Italy, horse stables.

Neufang, R. (1998). **Ein kritischer Bericht der Empfehlung für Pferde hielt in den Ställen. [A critical review of the recommendation for horses kept in stables]**. *Deutsche Tierärztliche Wochenschrift* 105(3): 109-111. ISSN: 0341-6593.

NAL Call Number: 41.8 D482

Descriptors: horses, housing, animal welfare, environmental factors, stable construction to benefit animals.

Language of Text: German.

Ochiiwa, T., O. Morita, H. Ehara, and H. Nomura (1999). [**Effect of the application of woodtip bedding on the horse stable barn on forage yield and some physical and chemical soil properties**]. *Bulletin of the Experimental Farm, Faculty of Bioresources Mie University (Japan)*(10): 57-65.

Descriptors: *Sorghum arundinaceum*, *Avena sativa*, farmyard manure, crop yield, soil chemico-physical properties, agricultural wastes, *Avena*, Gramineae, sorghum, wastes, yields.

Language of Text: Japanese.

- Pirkelmann, H. (1997). **Ohne Weide und Auslauf geht es nicht. Fuer Jungpferde kommt nur die Gruppenhaltung im Laufstall in Frage. [Without pasture and free range nothing works. For young horses only group housing in a loose housing system is possible].** *Wuerttemberg Agricultural Weekly* 164(8): 16-18, 20. ISSN: 0043-9606.
NAL Call Number: 18 W96
Descriptors: mares, foals, animal housing, design, free range husbandry, animal welfare, loose housing system, young horse needs, pastures, farming systems, grazing lands.
Language of Text: German.
- Pratt, S.E., L.M. Lawrence, T. Barnes, D. Powell, and L.K. Warren (2000). **Measurement of ammonia concentrations in horse stalls.** *Journal of Equine Veterinary Science* 20(3): 197-200. ISSN: 0737-0806.
NAL Call Number: SF951.J65
Descriptors: horses, housing, stall floors, ammonia, methods to limit ammonia exposure.
- Raabymagle, P. and J. Ladewig (2006). **Lying behavior in horses in relation to box size.** *Journal of Equine Veterinary Science* 26(1): 11-17. ISSN: 0737-0806.
Online: <http://www.sciencedirect.com/science/article/B75GX-4J6W40S-5/2/ddbfd00c2795d1e2762ef87744f0229b>
NAL Call Number: SF951.J65
Descriptors: lying behavior, sternal and lateral recumbency, rolling behavior, rotating behavior, effect of box size on resting behavior, equine welfare relevance.
- Raidal, S.L., D.N. Love, and G.D. Bailey (1995). **Inflammation and increased numbers of bacteria in the lower respiratory tract of horses within 6 to 12 hour of confinement with the head elevated.** *Australian Veterinary Journal* 72(2): 45-50. ISSN: 0005-0423.
NAL Call Number: 41.8 Au72
Descriptors: horses, effect of head elevation, bacterial contamination, respiratory system, equine lower respiratory tract, transportation, confinement.
- Raidal, S.L., R.H. Taplin, G.D. Bailey, and D.N. Love (1997). **Antibiotic [procaine penicillin] prophylaxis of lower respiratory tract contamination in horses confined with head elevation for 24 or 48 hours.** *Australian Veterinary Journal* 75(2): 126-131. ISSN: 0005-0423.
NAL Call Number: 41.8 Au72
Descriptors: horses, procaine penicillin, dosage rate variation, dosage frequency variation, respiratory disease, bacterial contamination, effects of head elevation.
- Raymond, S.L. and E.F. Curtis (2001). **Dust and ammonia levels associated with three flooring types and shavings in a horse stable.** *Canadian Journal of Animal Science* 81(4): 620. ISSN: 0008-3984.
NAL Call Number: 41.8 C163
Descriptors: horses, housing, stabling, flooring types, bedding, dust levels, ammonia levels, shavings, horse health.
Notes: Meeting Information: 2001 Annual Meeting of the Canadian Society of Animal Science, Guelph, ON, Canada; July, 2001.
- Riihimaki, M., L. Elfman, R. Walinder, and J. Pringle (2005). **Undersokning av stallmiljon och dess betydelse for uppkomst av luftvagssjukdomar hos manniskor och hastar. [Study of the stable environment and its significance in the occurrence of respiratory diseases in people and horses].** *Svensk Veterinartidning* 57(11): 27-28. ISSN: 0346-2250.
Descriptors: effect of housing, respiratory system, allergens, endotoxins, glucans, microorganisms, environmental risk factors, effect of ventilation.
Language of Text: Swedish.
- Ryan, B.E. (Inventor) (1995). **Product for deodorizing and sanitizing horse stalls, and to a process of making the product.** (US 5448967, September 12, 1995). *Official Gazette of the United States Patent and Trademark*

Office Patents, 1178 (2): 755. ISSN: 0098-1133.

Online: <http://www.uspto.gov/patft/index.html>

Descriptors: horses, housing, stall cleaning, odor control, sanitization methods, diatomaceous earth, cereal, enzymes.

Sanz, M. and M.A. Calvo (2002). **Estudio de la microbiota presente en la ranilla de caballos estabulados con cama de viruta.** [Study of the microbiota present in the hooves of horses stabled with beds of shavings].

Albeitar(59): 24-25.

Descriptors: horses, housing, stall contamination, bacteria, microbial flora, fungi, *Enterobacter agglomerans*, *Bacillus firmus*, *Proteus mirabilis*, *Penicillium granulorum*, *Aspergillus fumigatus*, relative humidity.

Language of Text: Spanish.

Sweeney, C.R., S. McDonnell, G.E. Russell, and M. Terzich (1996). **Effect of sodium bisulfate on ammonia concentration, fly population, and manure pH in a horse barn.** *American Journal of Veterinary Research* 57(12): 1795-1798. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, housing, stable management, sodium bisulfate, ammonia concentration, manure, fly control.

Tanner, M.K., A.M. Swinker, M.L. Beard, G.N. Cosma, J.L. Traub Dargatz, A.B. Martinez, and S.A. Olenchok (1998). **Effect of phone book paper versus sawdust and straw bedding on the presence of airborne Gram-negative bacteria, fungi and endotoxin in horse stalls.** *Journal of Equine Veterinary Science* 18(7): 457-461. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, effects of bedding type, bacteria, fungi, endotoxins.

Traub Dargatz, J.L., D.A. Dargatz, P.S. Morley, and M. Dunowska (2004). **An overview of infection control strategies for equine facilities, with an emphasis on veterinary hospitals.** *Veterinary Clinics of North America, The Equine Practice* 20(3): 507-520. ISSN: 0749-0739.

NAL Call Number: SF951.V47

Descriptors: horses, facility management, disease control, risk factors.

Traub-Dargatz, J.L., L.P. Garber, P.J. Fedorka-Cray, and K.E. Ferris (2000). **Fecal shedding of *Salmonella* spp by horses in the United States during 1998 and 1999 and detection of *Salmonella* spp in grain and concentrate sources on equine operations.** *Journal of the American Veterinary Medical Association* 217(2): 226-230. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: *Salmonella* spp, fecal shedding, equine facilities, facility management, grain or concentrate sampling.

United States. Animal and Plant Health Inspection Service. Veterinary Services. Centers for Epidemiology and Animal Health. National Animal Health Monitoring System (U.S.). (1998). **Biosecurity Practices on U.S. Equine Facilities**, U.S. Dept. of Agriculture: Fort Collins, Colorado, USA, 2 p.

Online: <http://www.aphis.usda.gov/vs/ceah/ncahs/nahms/equine/equine98/eq98bio.pdf>

NAL Call Number: aSF951.B56 1998

Descriptors: horses diseases, prevention, epidemiology, United States.

Vandenput, S., D.H. Duivivier, D. Votion, T. Art, and P. Lekeux (1998). **Environmental control to maintain stabled COPD horses in clinical remission: effects of pulmonary function.** *Equine Veterinary Journal* 30(2): 93-96. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, management, silage, wood residues, straw, environmental control, pathogenesis, respiratory diseases, diet, litter for animals, hay, feed grasses, agricultural wastes, animal housing, crop residues, feed, fermented products, forest products, grasses, organic diseases, processed plant products, processed products,

roughage, wastes, wood products, wood shavings, remission, chronic obstructive pulmonary disease.

Vandenput, S., D. Votion, D.H. Duvivier, E. Van Erck, N. Anciaux, T. Art, and P. Lekeux (1998). **Effect of a set stabled environmental control on pulmonary function and airway reactivity of copd affected horses.** *Veterinary Journal* 155(2): 189-195. ISSN: 1090-0233.

NAL Call Number: SF601.V484

Descriptors: horses, respiratory evaluation, blood gas analysis, chronic obstructive pulmonary disease, respiratory system, environmental factors, bedding, feed.

Vervuert, I. and M. Coenen (2001). **Aspekte der Fütterungs- und Haltungstechnik von Pferden. [Feeding and housing management in horses].** *Übersichten Zur Tierernahrung (Germany)* 29(2): 131-138. ISSN: 0303-6340.

Descriptors: horses, management practices, feeding, housing, ventilation, social housing, animal welfare.

Language of Text: German with an English summary.

Ward, P.L., J.E. Wohlt, and T. Otero (1996). **Daily usage and moisture contents of wheat straw, wood shavings and pelleted recycled newspaper as bedding in box stalls for mature horses.** *Journal of Animal Science* 74(Suppl. 1): 248. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, bedding materials, management practices.

Notes: Meeting Information: 88th Annual Meeting of the American Society of Animal Science, Rapid City, South Dakota, USA; July 24-26, 1996.

Wheeler, E. (2005). *Horse Facilities Handbook*, 1st edition, Midwest Plan Service: Ames, Iowa, 232 p. ISBN: 089373098X.

NAL Call Number: TH4930.H67 2005

Descriptors: stables design and construction, horses housing, handbooks, manuals.

Wyse, C.A., K. Skeldon, J.W. Hotchkiss, G. Gibson, P.S. Yam, R.M. Christley, T. Preston, D.R.S. Cumming, M. Padgett, and J.C. Copper (2005). **Effects of changes to the stable environment on the exhalation of ethane, carbon monoxide and hydrogen peroxide by horses with respiratory inflammation.** *The Veterinary Record* 157(14): 408-412. ISSN: 0042-4900.

NAL Call Number: 41.8 V641

Descriptors: housing, respiratory system, respiratory inflammation, effect of environmental change, ethane, carbon monoxide, hydrogen peroxide.

Zeitler Feicht, M.H. (2004). **Kritische Betrachtung der "Leitlinien zur Beurteilung von Pferdehaltungen" und Winteraussenhaltung von Pferden. [Important considerations regarding the guidelines "horse keeping with respect to animal welfare" and winter housing of horses].** *Deutsche Tierärztliche Wochenschrift* 111(3): 120-123. ISSN: 0341-6593.

NAL Call Number: 41.8 D482

Descriptors: horses, management practices, seasonal management, housing, animal welfare.

Language of Text: German with an English summary.

Notes: Special issue: *Animal Welfare*.

Zeitler Feicht, M.H. (1996). **Mindestanforderungen an die Gruppenhaltung von Pferden unter Tierschutzgesichtspunkten. [Minimum welfare requirements for housing horses in groups].** *Tierärztliche Umschau* 51(10): 611-614. ISSN: 0049-3864.

NAL Call Number: 41.8 T445

Descriptors: horses, group housing, animal welfare.

Language of Text: German with an English summary.

Zeitler Feicht, M.H. and S. Buschmann (2002). **Ist Standerhaltung von Pferden unter Tierschutzaspekten heute noch vertretbar? [Are standing stalls for horses acceptable today with regard to animal welfare?].** *Pferdeheilkunde* 18(5): 431-438. ISSN: 0177-7726.

Descriptors: horses, housing conditions, behavior, standing stalls, inadequate stall space, animal welfare.
Language of Text: German with an English summary.

Housing -- Web Resources

Animal Housing Systems.

Online: <http://www.abe.psu.edu/extension/factsheets/g/>

Description: Multiple fact sheets on equine facility design and maintenance.

Horses - Housing.

Online: <http://www.omafr.gov.on.ca/english/livestock/horses/housing.html>

Description: Multiple fact sheets on pasture and stable construction and maintenance as well as pest control strategies and season specific housing management.

Horse Housing. *Wright, B.*

Online: <http://www.omafr.gov.on.ca/english/livestock/horses/facts/05-045.htm>

Description: Explains indoor and outdoor housing options with consideration for owner/handler convenience and efficient daily activity.

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Law and Legislation

Adolphsen, J. (2003). **Die Kaufuntersuchung nach der Schuldrechtsreform. [New German law of obligations and vet inspections]**. *Praktische Tierarzt* 84(2): 114-119. ISSN: 0032-681X.

NAL Call Number: 41.8 P882

Descriptors: horse, law, veterinary inspection, sale of horses.

Language of Text: German with an English summary.

Adolphsen, J. (2003). **Die Kaufuntersuchung nach der Schuldrechtsreform. Teil 2. Neue Aspekte für die tierärztliche Kaufuntersuchung. [Reform of the Law of Obligation. Part 2. New aspects of veterinary inspection for purchase]**. *Praktische Tierarzt* 84(5): 372-377. ISSN: 0032-681X.

NAL Call Number: 41.8 P882

Descriptors: horse, law, veterinary inspection, sale of horses.

Language of Text: German with an English summary.

Adolphsen, J. (2002). **Das neue Pferdekaufrecht. [The new horse purchase legislation]**. *Pferdeheilkunde* 18(3): 294-297. ISSN: 0177-7726.

Descriptors: horse, legislation, veterinary inspection, sale of horses.

Language of Text: German.

Ammendrup, S. and A.E. Fussel (2001). **Legislative requirements for the identification and traceability of farm animals within the European Union**. *Revue Scientifique Et Technique International Office of Epizootics* 20(2): 437-444.

Abstract: European Community (EC) legislation requires identification and registration of bovine, ovine, caprine and porcine animals. For intra-Community trade, bovine animals must be accompanied by a passport and the required health certificate, and identified by a tag on each ear. The principles of active identification of bovine animals (by ear tags) and of ovine, caprine and porcine animals (by ear tags or tattoos) are harmonised within the EC. International passports are issued and recognised only for registered Equidae. The life-number was introduced as an instrument to allow uninterrupted identification of Equidae using passports. The principles of issuing and recording such numbers have been outlined by the affected industries, but require official approval. Active identification of Equidae using electronic devices is not regulated by EC legislation, but research in livestock is underway.

Descriptors: European Union, international passports for equines, identification and registration of bovine, ovine, caprine and porcine animals, electronic identification of horses, animal identification systems.

Anonymous (2005). **Board responds to legislative recommendations**. *Journal of the American Veterinary Medical Association* 227(3): 367-368. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: animal legislation, commercial sale and slaughter, free roaming horses, Wild Free Roaming Horses

and Burros Act of 1971.

- Anonymous (2004). **AVMA takes a stand on legislative initiatives.** *Journal of the American Veterinary Medical Association* 224(11): 1733. ISSN: 0003-1488.
NAL Call Number: 41.8 Am3
Descriptors: animal identification systems, animal welfare, animal legislation, breeding, cattle, dogs, horses, meat, veterinary medicine.
- Anonymous (2003). **Draft legislation on equine passports.** *The Veterinary Record* 152(14): 410-411. ISSN: 0042-4900.
NAL Call Number: 41.8 V641
Descriptors: animal identification systems, European Union, transportation of horses, equine passports.
- Anonymous (1997). **Government issues draft legislation on welfare during transport.** *The Veterinary Record* 140(3): 54. ISSN: 0042-4900.
NAL Call Number: 41.8 V641
Descriptors: animal welfare legislation, transportation legislation, animal welfare standards, cattle, drinking, eating, Great Britain, horses, sheep, swine.
- Bajanowski, T., H. Kohler, P.F. Schmidt, C.F. von Saldern, and B. Brinkmann (2001). **The cloven hoof in legal medicine.** *International Journal of Legal Medicine* 114(6): 346-8.
Abstract: The injury of a horse's leg needed to be investigated to answer the question whether the fracture had been caused by an accident or by intentional manipulation. By toxicology and using scanning electron microscopy with an energy dispersive X-ray spectrometer (SEM-EDX) the suspicion obtained by morphology could be confirmed. Toxicologically a short term anaesthetic was found, and by EDX ferric oxide particles could be detected in the wound indicating that the injury was caused by a sharp pointed metallic instrument and not as stated by the owner by a wooden bar. As the result of the interdisciplinary investigation using modern techniques, there is no doubt that the owner attempted to fraudulently claim on an insurance policy.
Descriptors: insurance fraud, hoof and leg injuries in horses, determination of accidental or intentional injury, forensic medicine, legal case.
- Baker, P. (1997). **Legal liability, risk management and the equine veterinarian.** *Australian Equine Veterinarian* 15(4): 162-163. ISSN: 1032-6626.
NAL Call Number: SF604.A97
Descriptors: horses, veterinary practice, legal liability.
- Bechthold, I. (1995). **Veroeffentlichung einer rechtskraeftigen Entscheidung - Nummernheissbrand bei Pferden. [Publication of legal decision - Cauterization of horses].** *Tieraerztliche Praxis (Germany)* 23(1): 42-45. ISSN: 0303-6286.
Descriptors: horses, marking, fires, animal welfare, legislation, disasters, methods, cauterization.
Language of Text: German.
- Bemmann, K. (2005). **Das Pferd im Verbrauchsguterkaufrecht. [The horse in consumer goods purchase law].** *Pferdeheilkunde* 21(2): 142-154. ISSN: 0177-7726.
Descriptors: consumer protection, legislation, horses.
Language of Text: German.
- Bemmann, K. (2004). **Tierarztliche Kaufuntersuchung von Pferden: die Rontgenklasse II im Spiegel der Rechtsprechung. [Veterinary purchase examination of horses: the radiographic class II in the view point of the law].** *Praktische Tierarzt* 85(12): 898-902. ISSN: 0032-681X.
Descriptors: diagnostic techniques, joint diseases, legislation, radiography, veterinary jurisprudence, veterinary services, horses.
Language of Text: German.
- Biagi, G., S. Nannipieri, and F. Signorini (1996). **Piano di controllo dell'arterite virale equina (AVE). Aspetti**

tecnico-legislativi disciplinanti la movimentazione degli equini. [Control plan for equine viral arteritis. Technical and legislative aspects concerning the movement of horses]. *O&DV Obiettivi e Documenti Veterinari (Italy)* 17(7/8): 15-19. ISSN: 0392-1913.

NAL Call Number: QL750.E82

Descriptors: horses, disease management, legislation, equine viral arteritis.

Language of Text: Italian.

Bodamer, J.K.M. (1999). **Die Entwicklung Der Gesetzgebung in Der Republik Irland Zum Schutz Von Pferden Wahrend Des Transportes. [Development of Legislation in the Irish Republic for Protecting Horses During Transport]**, 181 p.

Descriptors: horses, transport, animal welfare, legislation.

Language of Text: German with an English summary.

Boissevain, I. (2001). **Het is ook nooit goed! [It is never right! Veterinary disciplinary law].** *Tijdschrift Voor Diergeneeskunde* 126(14-15): 506.

Descriptors: horse disease diagnosis, lameness, veterinary legislation, Netherlands.

Language of Text: Dutch.

Bruyas, J.F. and R. Corde (2005). **Le controle antidopage: eviter les pieges et... les poursuites. [Antidoping control: avoiding pitfalls and... legal proceedings].** *Bulletin De L'Academie Veterinaire De France* 158(1): 57-60. ISSN: 0001-4192.

Descriptors: doping, drug residues, drug therapy, drugs, pharmacodynamics, racehorses, regulations, urine, veterinarians, horses.

Language of Text: French with an English summary.

Bruyninckx, E.L. and I. Boissevain (2001). **Aansprakelijkheid bezitter van een paard voor letsel dierenarts. [Legal liability of the owner of a horse for injury to a veterinarian].** *Tijdschrift Voor Diergeneeskunde* 126(12): 431.

Descriptors: legal liability, ownership legislation and jurisprudence, veterinarians, horse behavior, Netherlands.

Language of Text: Dutch.

Centner, T.J. (1997). **Legal rights of veterinarians under veterinary Good Samaritan statutes and equine liability statutes.** *Journal of the American Veterinary Medical Association* 210(2): 190-194. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: horses, legal rights, veterinary practice, legislation, liability.

Dieckhofer, R., L. Bode, H. Ludwig, M. Kiefer, P. Reckwald, and A. Rupp (2004). **Bornavirus (BDV) beim Pferd - Klinik, Diagnostik und Therapie bei einem lokalen Infektionsgeschehen im Saarland und tierseuchenrechtliche Betrachtungen. [Bornavirus (BDV) in horses - clinical symptoms, diagnosis, and therapy during a local epidemic in the federal state Saarland, Germany, and current legal regulations].** *Tierarztliche Umschau* 59(11): 619-632. ISSN: 0049-3864.

NAL Call Number: 41.8 T445

Descriptors: horses, bornavirus, BDV infection, amantadine, antigens.

Language of Text: German with an English summary.

Fenwick, A. (1998). **Legal implications of medication in racehorses from the New Zealand racing conference perspective.** In: *Proceedings from the Annual Seminar, Equine Branch, NZVA, June, 1998, Rotorua, New Zealand*, Veterinary Continuing Education, Massey University: Palmerston North, New Zealand, Vol. 183, p. 119-121.

NAL Call Number: SF604.P82 no. 183

Descriptors: horses, racehorses, veterinary prescriptions, drug therapy, law, legislation, seminar proceedings.

Flynn, R. (2002). **The legal implications of the purchase of a horse.** In: M.H. Hayes (Editor), *Veterinary Notes for Horse Owners*, Ebury Press: London, UK, p. 811-817.

Descriptors: horses, law, horse auctions, certification process, sale regulations.

Franzky, A., W. Bohnet, F. Kuhne, and J. Luy (2005). **Tierschutzrechtliche Aspekte bei Rodeo-veranstaltungen.** [Animal welfare legal aspects of rodeo events]. *Deutsche Tierärztliche Wochenschrift* 112(3): 92-94. ISSN: 0341-6593.

NAL Call Number: 41.8 D482

Abstract: Rodeo events have been criticised by animal welfare organisations as being adverse to animal protection, for years. This was the motive for TVT to put several of these criticised disciplines to evaluation in terms of animal protection aspects. For that purpose, various rodeo events were visited, and videotaped material of almost all events, which had taken place in Germany in 2003 and 2004, was evaluated. Rodeo events are subject to and 11, sec.1, No. 3d, German Animal Protection Act, which implies compulsory accreditation. In the scope of such events, causing any sort of pain and suffering (and 3 No. 6 German Animal Protection Act) is prohibited. A proof of the severity of the pain caused, is therefore no necessity. For the "critical" disciplines "Bare Back Riding" and "Saddle Bronc Riding" a so called "flank" is used. A flank is a leather strap, fastened to the sensitive parts of the horse skin, (around the flanks,) which is tightened to a maximum as soon as the horse is released from the starting box. Analysis show, that the strap has to be seen as the trigger for the wanted kow-tow. The different coping strategies shown by the animals prove that the leather strap is an apt instrument to cause pain and/or suffering (anxiety/fear/stress) in horses. Bull riding, instead, showed that the rider has to be seen primarily as the trigger for defence behaviour, here. In consideration of the current legal position and taking ethic principles into account, it seems appropriate to only authorise rodeo events under the condition of a flank strap ban. Bull riding should be banned in general.

Descriptors: animal welfare legislation, rodeos, animal protection movement, severity of pain during rodeo events, bareback riding, saddle bronc riding, bull riding, Germany.

Language of Text: German.

Gerhards, H. (2003). **Kastrationskomplikationen und Möglichkeiten zu deren Vermeidung: Chirurgische und forensische Betrachtungen.** [Complications associated with castration of stallions and their prevention. Surgical and legal aspects]. *Pferdeheilkunde* 19(1): 37-44. ISSN: 0177-7726.

Descriptors: horses, stallions, castration, surgery, law, complications, etiology.

Language of Text: German with an English summary.

Gilligan, B. (2002). *Guide for Owners and Riders. Practical Horse Law: A Guide for Owners and Riders*, Blackwell Science: Malden, Massachusetts, USA, 246 p. ISBN: 0632056738.

NAL Call Number: SF285.25.G56 2002

Descriptors: horse law and legislation in Great Britain, horse owners.

Giuliani, A. (2005). **Un nuovo inquadramento giuridico per il cavallo sportivo (Unione Europea; legislazione).** [A new juridical framework for sport horse (European Union; legislation)]. *O&DV Obiettivi e Documenti Veterinari (Italy)* 26(7-8): 11-12, 14, 16. ISSN: 0392-1913.

Descriptors: racehorses, saddle horses, legislation, regulations, European Union, drug therapy, doping, veterinary medicine, meat animals, domestic animals, Equidae, horses, illegal practices, international agreements, international organizations, international relations, mammals, Perissodactyla, therapy, useful animals, working animals.

Language of Text: Italian.

Giuliani, A. (2003). **La somministrazione del farmaco nel cavallo sportivo. 1. Confronto tra la legislazione vigente e le reali esigenze del settore.** [Drug administration in saddle horse. 1. Comparison among legislation in force and actual needs of the sector]. *O&DV Obiettivi e Documenti Veterinari (Italy)* 24(2): 27-31. ISSN: 0392-1913.

NAL Call Number: QL750.E82

Descriptors: saddle horses, racehorses, drug therapy, public health legislation, legal liability, residues, horse meat, veterinarians, registration, regulations, veterinary medicine, animal products, domestic animals, Equidae, horses, law, legislation, mammals, meat, occupations, Perissodactyla, therapy, useful animals, working animals.

Language of Text: Italian.

- Giuliani, A. (2003). **La somministrazione del farmaco nel cavallo sportivo. 2. Problemi legislativi e proposte migliorative. [Drug administration in saddle horse. 2. Legislative problems and proposals of improvement].** *O&DV Obiettivi e Documenti Veterinari (Italy)* 24(3): 27-30. ISSN: 0392-1913.
NAL Call Number: QL750.E82
Descriptors: saddle horses, racehorses, drug therapy, public health legislation, legal liability, residues, horse meat, veterinarians, registration, regulations, veterinary medicine, animal welfare, health hazards, animal products, domestic animals, Equidae, horses, law, legislation, mammals, meat, occupations, Perissodactyla, therapy, useful animals, working animals.
Language of Text: Italian.
- Grundler, C. (1996). **Die Ausrüstung des Trabrennpferdes unter Tierschutz-Gesichtspunkten. [Harness and other equipment for trotting horses to comply with welfare legislation].** *Tierärztliche Umschau* 51(10): 622-624. ISSN: 0049-3864.
NAL Call Number: 41.8 T445
Descriptors: horses, trotters, law, legislation, animal welfare, harness, equipment compliance.
Language of Text: German with an English summary.
- Guizzardi, F., A. Vallenari, G. Franzini, F. Aldi, L. Piva, G. Zambelli, and G. Cattini (1997). **Legislazione veterinaria della riproduzione animale. [Veterinary legislation on animal breeding].** *Informatore Agrario* 53(12): 57-64. ISSN: 0020-0689.
NAL Call Number: 281.8 IN32
Descriptors: farm animals, horses, pigs, goats, cattle, law, legislation, veterinary procedures, breeding, artificial insemination.
Language of Text: Italian.
- Hausleitner, A. (1998). **Nutztierschutz in Österreich. Die Bearbeitung verfassungs- und verwaltungsrechtlicher, sowie rechtsphilosophischer und rechtspolitischer Fragen. [Farm animal protection in Austria. Questions of conditional law, administrative law, philosophy of law and questions of the law of politics are discussed].** *Veröffentlichungen Bundesanstalt Für Alpenländische Landwirtschaft Gumpenstein*(30): 149.
Descriptors: farm animals, animal welfare, law, legislation, veterinary history, dehorning, slaughter, castration, literature reviews, ethical management, housing, surgery, amputation, debeaking.
Language of Text: German with an English summary.
- Hentrich, B. and R. Bose (1996). **Parasitologische Import- und Exportuntersuchungen beim Pferd: gesetzliche Bestimmungen sowie Stand der Diagnostik. [Parasitological import- and export studies of horses: legislation as well as diagnostic status].** In: *Therapie und Planmassige Bekämpfung von Parasitosen der Nutztiere und des Pferdes: Tagung der Fachgruppe "Parasitologie und Parasitäre Krankheiten", June 28, 1995-June 30, 1995, Bad Langensalza, Germany, Deutsche Veterinarmedizinische Gesellschaft: Giessen/Lahn, Germany, p. 161-169.*
Descriptors: horses, laws, legislation, disease diagnosis, parasites, exports, imports, international trade.
Language of Text: German.
- Himmelmann, W. (1998). **Das Kartellrecht und Pferdewette. Rechtliche Probleme bei der Finanzierung des Galopp- und Trabrennsports. [Cartel law and horse racing. Legal problems in financing gallop and trotting sports].** *Agrarrecht* 28(6): 206-208. ISSN: 0340-840X.
Descriptors: horses, sports, horse racing, cartel legislation, media marketing, breeders, performance, trade associations.
Language of Text: German.
- Koch, C.A. (2003). **Experimentelle Grundlagen zu ausgewählten Anwendungsgebieten, praxisübliche Produktkonzepte und futtermittelrechtliche Wertung. [Medicinal plants for horses - experimental bases on their application to selected areas - product concepts in practice and legal evaluation of their use in animal food].** 208 p.
Descriptors: horses, nutrition, medicinal plants, law, legislation, animal feed, feed supplementation.

Language of Text: German with an English summary.
Notes: Thesis.

Krenger, B. and R. Straub (2002). **Die rechtlichen Aspekte der Kaufuntersuchung in der Schweiz. [Legal aspect of purchase examination of horses in Switzerland].** *Pferdeheilkunde* 18(3): 291-292. ISSN: 0177-7726.

Descriptors: horses, veterinary examination, law, legislation.

Language of Text: German.

Lenz, T.R. (2004). **An overview of acceptable euthanasia procedures, carcass disposal options, and equine slaughter legislation.** In: *Proceedings of the 50th Annual Convention of the American Association of Equine Practitioners, December 4, 2004-December 8, 2004, Denver, Colorado, USA*, p. 191-195.

Online: <http://www.aaep.org>

Descriptors: animal welfare, barbiturates, bolts, burning, carcass disposal, composting, euthanasia, guidelines, legislation, overdose, pentobarbital, slaughter, trauma, horses.

Lipinska, J., J. Szarek, and D. Przewdziecka (2004). **Wady fizyczne koni w swietle polskich aktow prawnych z poczatku, przeomu i konca XX wieku. [Physical defects in horses in the light of legal regulations from the beginning, the turn and the end of the 20th century].** *Medycyna Weterynaryjna* 60(6): 570-572. ISSN: 0025-8628.

NAL Call Number: 41.8 M463

Descriptors: horses, veterinary examination, purchase, physical defects, legislation, legal regulation.

Language of Text: Polish with an English summary.

Macioek, H. (1996). **Wymagania sanitarno-weterynaryjne w miedzynarodowych przewozach zwierzat rzezych z uwzglednieniem Konwencji Europejskiej oraz dyrektyw Rady Europy w sprawie ochrony zwierzat. [Current legislation on transportation of slaughter animals in relation to animal welfare rules laid down in EU directives].** *Zycie Weterynaryjne* 71(5): 129-135. ISSN: 0137-6810.

Descriptors: horses, pigs, goats, sheep, cattle, laws, legislation, transportation, animal welfare.

Language of Text: Polish.

Mangematin, G. (1998). **L'autopsie du cheval aspects reglementaires et formels. [Postmortem examination of the horse: legal aspects].** *Bulletin Des GTV(4)*: 13-18. ISSN: 0399-2519.

NAL Call Number: SF602.G7

Descriptors: horses, legislation, law, veterinary procedure, postmortem examinations, insurance.

Language of Text: French with Spanish and English summaries.

McIlwraith, C.W. (2005). **Licensed medications, "generic" medications, compounding and nutraceuticals - what has been scientifically validated, where do we encounter scientific mistruth and where are we legally?** In: *Equine Lameness, Equine Medicine and Infectious Disease. Proceedings of the 27th Bain Fallon Memorial Lectures, July 11, 2005-July 15, 2005, Rydges Lakeland Resort, Queenstown, New Zealand*, p. 98-118.

Descriptors: bioavailability, corticoids, drugs, joint diseases, lameness, non steroidal antiinflammatory agents, veterinary medicine.

Meyer, H. (2000). **Der vernunftige Grund im deutschen Tierschutzgesetz, im Hinblick auf die Zucht und die Nutzung des Pferdes. [Rational reasons for the German animal welfare laws on the breeding and use of horses].** *Pferdeheilkunde* 16(3): 229-242. ISSN: 0177-7726.

Descriptors: horses, laws, legislation, breeding, animal welfare.

Language of Text: German with an English summary.

Meyn, K. (2001). **EU legislation in animal production and health.** *Zbornik Biotehniske Fakultete Univerze v Ljubljani Kmetijstvo* 77(Suppl. 31): 35-44. ISSN: 1408-340X.

Descriptors: European Union, domestic animals, cattle, horses, pigs, sheep, goats, animal production, market supply, legislation, breeding, genetic evaluation, breed registration.

Language of Text: English with a Slovenian summary.

Notes: Meeting Information: 9th International Symposium "Animal Science Days", Radenci, Slovenia; 3-5

October 2001.

Michell, A.R. and R. Ewbank (1998). *Ethics, Welfare, Law and Market Forces: The Veterinary Interface - Proceedings of a Symposium, November 14, 1996-November 15, 1996, Royal College of Veterinary Surgeons, UK, Universities Federation for Animal Welfare (UFAW): Wheathampstead, UK, 235 p.* ISBN: 0900767995.

NAL Call Number: HV4704.E84 1998

Descriptors: animal suffering, veterinary ethics, Farm Animal Welfare Council, commercial birds, farm animals, horses, pigs, laboratory animals, companion animals, animal perception, stress, psychological stress, laws and legislation, ethics.

Moreno, M. del C. L. (2001). **Aspetti medico-legali della visita medico-veterinaria nella compravendita di equidi. [Medico-legal aspects of veterinary involvement in the sale of horses].** *Professione Veterinaria* 11(12): 7-10. ISSN: 1121-1547.

Descriptors: horses, sale, law, legislation, veterinary examination, liability.

Language of Text: Italian.

Muller Gerhards, F. and W. Bollwahn (1997). **Begrundung und Vorschlage zur Neuordnung des Viehkaufrechts. [Basis and proposals for revision of livestock-trading law].** *Deutsche Tierarztliche Wochenschrift* 104(9): 401-404. ISSN: 0341-6593.

NAL Call Number: 41.8 D482

Descriptors: livestock, laws, legislation, trade regulations.

Language of Text: German with an English summary.

Muller Gerhards, F. and W. Bollwahn (1997). **Begrundung und Vorschlage zur Neuordnung des Viehkaufrechts. [Motivation and proposals for revising the stock trading law].** *Deutsche Tierarztliche Wochenschrift* 104(9): 401-404. ISSN: 0341-6593.

NAL Call Number: 41.8 D482

Abstract: The German stock-trading law is a special statute that has been put into effect at the end of the last century (sections 482-492 BGB, i.e. civil code, and Kaiserliche Verordnung, i.e. imperial regulation). It promotes agricultural interests and contains guarantees which are out-of-date. This state had led to serious irritabilities with the general law of trade (sections 459-480 BGB). The difference in legal treatment of persons buying stock (i.e. equines, cattle, sheep and swine) or those buying other animals (e.g. dogs, cats, poultry) seems to be unsupportable any longer. For this reason the constitutional principle of equality in legal matters (section 3.1, German constitution) will be used and interpreted as a motivation for the importance to revise the antiquated stock-trading law.

Descriptors: revising stock trading laws, animal welfare legislation, cats, cattle, dogs, horses, poultry, sheep, swine, Germany.

Language of Text: German.

Nolen, R.S. (2002). **Slaughter of horses for human food would be banned by legislation.** *Journal of the American Veterinary Medical Association* 220(8): 1128. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: horses, laws, legislation, horse slaughter prohibition, human consumption.

O'Malley, J. and S. Hassett (2002). **April 1st laws.** *Journal of Equine Veterinary Science* 22(4): 142-143. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, animal behavior.

Pezza, F. (2003). **Il cavallo e la legge. [The horse and the law].** *Summa (Italy)* 20(3): 9.

Descriptors: horses, legislation, laws, European Union, veterinary medicine.

Language of Text: Italian.

Pick, M. (1996). **Ausrustung des Reitpferdes. Eine Betrachtung aus dem Blockwinkel des Tierschutzes. [Harness**

for riding horses to comply with welfare legislation]. *Tierärztliche Umschau* 51(10): 624, 626-628. ISSN: 0049-3864.

NAL Call Number: 41.8 T445

Descriptors: horses, law, legislation, harnesses, animal welfare.

Language of Text: German with an English summary.

Plewa, D. (1995). **Rechtskunde fuer Reiter. Zur Haftung und Risikoverteilung des Spediteurs.** [Laws for riders. **Liability and risk distribution of the forwarding agent**]. *Reiterjournal (Germany)* 16(12): 73-74. ISSN: 0173-2404.

Descriptors: transport of horses, legal liability for horseback riders, risks associated with horses, law and legislation.

Language of Text: German.

Rambags, B. and R. van Markus (2002). **Regelgeving paarden-KI.** [Legislation for horses-artificial insemination]. *Tijdschrift Voor Diergeneeskunde* 127(9): 304-305.

Descriptors: artificial insemination in horses, veterinary legislation, Europe, horses, Netherlands, horse breeding and reproduction.

Language of Text: Dutch.

Rechtsanwalt, V. and J. Brinkmann (2005). **Der Pferdekauf nach der Schuldrechtsreform.** [Buying horses after the reform of the law of contract]. *Agrar Und Umweltrecht* 35(6): 181-189. ISSN: 0340-840X.

Descriptors: contract law, Germany, horse purchase legislation, horse sale legislation.

Language of Text: German.

Rizzatti, D. and L. Bettinelli (1995). **Attuale normativa sulla riproduzione equina.** [Current legislation concerning equine reproduction in Italy]. *O&DV Obiettivi e Documenti Veterinari (Italy)* 16(11): 7-10. ISSN: 0392-1913.

NAL Call Number: QL750.E82

Descriptors: horses, laws, legislation, breeding, reproduction, artificial insemination, partuition.

Language of Text: Italian.

Rock, A. (2006). **The new pharmacy laws: what they mean and how they affect VNs.** *VN Times* 6(5): 4-5.

Online: www.vetnurse.co.uk

Descriptors: equine veterinary medicine, veterinary nursing, legislation, pharmacology.

Rutgers, L.J. (2002). **De gevolgen van het ingrepenbesluit (Gezondheids- en welzijnswet voor dieren) voor enkele lichamelijke ingrepen bij paarden.** [The consequences of the surgery decision (health and welfare law for animals) for certain physical surgeries in horses]. *Tijdschrift Voor Diergeneeskunde* 127(14-15): 462-466.

Descriptors: animal welfare legislation, surgical decisions, horse health and welfare, decision making, evidence based medicine, Netherlands, tail surgery, veterinary medicine.

Language of Text: Dutch.

Schule, E. (2001). **Arzneimittelrechtliche Veranderungen in der Pferdepraxis.** [Changes in legislation concerning drug therapy for horses]. *Praktische Tierarzt* 82(12): 1047-1049. ISSN: 0032-681X.

NAL Call Number: 41.8 P882

Descriptors: horses, laws, legislation, drug administration, therapy.

Language of Text: German.

Schuppel, H. and G. Kny (2001). **Lebensmittelrechtliche Anforderungen an die Gewinnung und Verarbeitung von Stutenmilch.** [Food legal aspects with regard to marketing of mare milk]. *Tierärztliche Praxis Ausgabe G, Grosstiere/Nutztiere* 29(2): 108-113. ISSN: 1434-1220.

NAL Call Number: SF603.V43

Descriptors: horses, mare milk, legislation, laws, milk products, marketing, food safety.

Language of Text: German with an English summary.

Scoggins, G.A. (2005). **Legal considerations concerning patient medical records.** In: *Proceedings of the 51st Annual*

Convention of the American Association of Equine Practitioners, December 3, 2005, Seattle, Washington, USA, American Association of Equine Practitioners (AAEP): Lexington, KY, USA, Vol. 51, p. 515-519.

NAL Call Number: SF601.A46

Descriptors: horses, large animal practice, veterinary jurisprudence, medical history.

Stull, C.L. (2000). **Review: slaughter horse transportation-science, societal concerns, and legislation.** *Professional Animal Scientists* 16(3): 159-163. ISSN: 1080-7446.

NAL Call Number: SF51.P76

Descriptors: horses, animal transport, laws and regulations, USDA, animal welfare, stocking rate, duration, trailers, literature reviews, distance-traveled.

Stull, C.L. (1996). **History of U.S. equine welfare and legislation.** *Pferdeheilkunde* 12(4): 391-392. ISSN: 0177-7726.

Descriptors: horses, animal welfare, legislation, history, United States.

Language of Text: English with a German summary.

Notes: Meeting Information: Association for Equine Sports Medicine, 15th Meeting on Equine Welfare and Sports Medicine, Bonn, Germany; June 24-28, 1996.

Van Eenoo, P. and F.T. Delbeke (2002). **Doping in de paardensport, geschiedenis van misbruik, regelgeving en actuele opsporingstechnieken. [Doping in equine sport, history of abuse, legislation and current searching techniques].** *Vlaams Diergeneeskundig Tijdschrift* 71(5): 317-325. ISSN: 0303-9021.

NAL Call Number: SF967.M3N49 1991

Descriptors: horses, analgesics, detection, legislation, history.

Language of Text: Dutch.

Law and Legislation -- Web Resources

Animal Law Review.

Online: http://www.lclark.edu/law/law_reviews/animal_law_review/

Description: Law review maintained by the students of Lewis & Clark Law School with the purpose of educating individuals on animal related legal issues. Provides links pertaining to animal related law as well as information on subscription and submission to the journal.

Journal of Animal Law and Ethics.

Online: <http://www.law.upenn.edu/groups/jale/>

Description: Independent student maintained journal at the University of Pennsylvania Law School started in Spring 2005 providing an interdisciplinary forum for animal legal and ethical issues. Includes journal subscription and submission information.

Horse Welfare in North America. *Freeman, D.A.*

Online: <http://www3.vet.upenn.edu/labs/equinebehavior/hvnmkshp/hv02/freeman.htm>

Description: Discussion of the current state of equine welfare legislation in North America.

AWIC Newsletter: The Horse Protection Act.

Online: <http://www.nal.usda.gov/awic/newsletters/v8n2/8n2hpa.htm>

Description: Describes specific components of the Horse Protection Act and includes details on enforcement and penalties for non-compliance.

Michigan State University College of Law: Animal Legal and Historical Web Center.

Online: <http://www.animallaw.info/>

Description: Over 700 full-text animal related court cases and legal articles. Provides Web search capabilities

by location, subject, and species.

U.S. Code: Title 15, Chapter 44—Protection of Horses.

Online: http://www.law.cornell.edu/uscode/html/uscode15/usc_sup_01_15_10_44.html

Description: Links to sections of the U.S. Code pertaining to horse protection.

Equine Law. *Miller, G.&.M.P.S.C.*

Online: http://www.horselaw.com/index.php?b=equine_law

Description: Provide articles on horse laws, selected cases on equine-related matters, and resources for horse owners, horse-related businesses, and lawyers advising clients on horse-related topics.

Equine Law Pathfinder. *Victoria Williamson.*

Online: <http://www.scribd.com/doc/27467751/Equine-Law-Pathfinder>

Description: Regulations and codes for U.S. equine law, legal periodical articles and encyclopedias, bibliography of in-print and internet equine law resources, and specific legal cases.

Horse Protection Act Information.

Online: http://www.aphis.usda.gov/animal_welfare/hp/index.shtml

Description: Includes links to the Horse Protection Act, horse protection training manual, current issues involving the Horse Protection Act, and related USDA, Animal Care publications.

Rowland v. USDA.

Online: <http://asci.uvm.edu/equine/law/cases/cruel/rowland.htm>

Description: Rowland challenges the USDA decision to exclude his Tennessee Walking Horse from the show ring and the \$2000 fine. Rowland bases his challenge on the fact that his horse showed signs of previous soring but was not sore at the time of examination. The Court upholds the USDA decision based on the Horse Protection Act (HPA) stipulation that any horse born after the effective date of the HPA showing signs of soring shall be withheld from future showing.

Horse Protection Program Strategic Direction Summary, Public Meetings, 1996. *Stull, C.L.*

Online: http://www.vetmed.ucdavis.edu/vetext/INF-AN/INF-AN_HORSPRTX1.HTML

Description: Extensive summary of multiple aspects of the Horse Protection Act.

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Nutrition and Feeding

Anonymous. (1997). *2nd International Conference on Feeding Horses, March 17, 1997-March 20, 1997, United Kingdom*, Dodson and Horrell Ltd.: Kettering, United Kingdom, 35 p.

Descriptors: heat stress, foot diseases, horses, organic diseases, stress, laminitis.

Argo, C.M.G., J.E. Cox, C. Lockyer, and Z. Fuller (2002). **Adaptive changes in the appetite, growth and feeding behaviour of pony mares offered ad libitum access to a complete diet in either a pelleted or chaff-based form.** *British Society of Animal Science* 74(pt. 3): 517-528. ISSN: 1357-7298.

NAL Call Number: SF1.A56

Abstract: Seven, 3-year-old pony mares (approximately 230 kg) were used in a cross-over study to compare the appetite, energy and nutrient digestibilities, growth rate and feeding behaviour, when a complete diet was offered ad libitum in either the original loose-chaff mix (C), or as a more convenient, milled and pelleted preparation (P). Ad libitum access to the study diet (gross energy = 17.2 MJ/kg dry matter (DM)) was attained over 2 weeks. In the following 4 weeks, groups 1 (no. = 3) and 2 (no. = 4) received pelleted and chaff-based diets respectively. Dietary forms were exchanged during week 5 and ad libitum provision continued for a further 4 weeks. Behaviour and apparent nutrient digestibilities were assessed in weeks 3 and 4 of each period. Pelleted food had a lower proportion of water (P, 0.12; C, 0.22), but relative proportions of oil (0.04), crude protein (0.08), crude fibre (0.29), neutral-detergent fibre (NDF; 0.53) and gross energy (GE) were neither altered by food processing nor time. Apparent digestibilities (DM, 0.49; GE, 0.50; NDF, 0.40 in period 1) of the pelleted and chaff-based diets were similar within periods but decreased ($P < 0.01$) to a similar extent for both diet types (proportional changes: DM, -0.14; GE, -0.16; NDF, -0.28) in period 2. Overall, mean intakes of digestible energy (DE) for chaff-fed animals during period 1 were 0.73 ($P < 0.001$) of pellet DE intake (DEI). Mean DEI of pellets increased ($P < 0.001$) during period 1 to attain 1.76 (s.e. 0.25) MJ/kg M0.75 on day 25. Following transfer from pellets to chaff, DEI decreased ($P < 0.001$) to 0.68 (s.e. 0.07) MJ/kg M0.75 by the end of period 2. In contrast, DEI of animals which progressed from chaff to pellets remained relatively constant between periods. Oestrous behaviour caused no detectable change in the appetite of individual mares. Irrespective of differences in DEI, average daily gain (ADG) in body weight and condition score (CS) did not differ between groups. Overall, mean ADG decreased ($P < 0.01$) from 1.54 (s.e. 0.17) kg/day in period 1 to 0.26 (s.e. 0.08) kg/day in period 2. Changes in body weight were associated with CS ($R^2 = 0.72$). Each CS point represented a 53.4 (s.e. 4.8) kg gain in body weight. Chaff meals were longer (30.6 (s.e. 1.6) min, $P < 0.001$), less frequent (23.8 (s.e. 1.4) per day, $P < 0.001$) and associated with a lower bite rate (3.8 (s.e. 0.2) per min, $P < 0.001$) and increased chewing requirement (23 (s.e. 1.2) per bite, $P < 0.001$), which decreased the rate of DM intake (17.0 (s.e. 0.9) g/min, $P < 0.001$). Overall, chaff-fed animals spent more time feeding (0.50 (s.e. 1.3) of the time; $P < 0.001$), primarily at the expense of non-feeding activity and rest. The ad libitum feeding regime enabled stabled ponies to re-establish natural feeding patterns and offers a viable alternative to meal and forage feeding. The more slowly ingested chaff form maximized time spent feeding and limited changes in DEI during the introductory period. Although CS and ADG increased over the first 4 weeks, growth and appetite returned to near maintenance values within 9 weeks in association with a decrease in dietary energy intake and nutrient

digestibility.

Descriptors: horses, unrestricted feeding, feeding behavior, pelleted feeds, chaff, forage, complete feeds, energy intake, voluntary intake, body weight, body condition, digestibility, appetite, feeding preferences.

Austbo, D. and H. Volden (2006). **Influence of passage model and caecal cannulation on estimated passage kinetics of roughage and concentrate in the gastrointestinal tract of horses.** *Livestock Science* 100(1): 33-43. ISSN: 1871-1413.

Descriptors: evaluation methods, non-linear passage model, total tract retention time, hindgut fractional passage rates, hay, concentrates, effect of caecal cannulation on passage parameters.

Notes: Meeting Information: Nutritive Value of Concentrates in Horses. Papers presented at the 54th EAAP meeting, Rome, Italy, 2003.

Cairns, M.C., J.J. Cooper, H.P.B. Davidson, and D.S. Mills (2002). **Association in horses of orosensory characteristics of foods with their post-ingestive consequences.** *British Society of Animal Science* 75(2): 257-265. ISSN: 1357-7298.

NAL Call Number: SF1.A56

Descriptors: horses, feeding preference, nutrient content.

Carmalt, J.L., N.F. Cymbaluk, and H.G.G. Townsend (2005). **Effect of premolar and molar occlusal angle on feed digestibility, water balance, and fecal particle size in horses.** *Journal of the American Veterinary Medical Association* 227(1): 110-113. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: horses, feeding, nutritional intake, dental effects, feed digestibility, molars.

Carmalt, J.L., H.G.G. Townsend, E.D. Janzen, and N.F. Cymbaluk (2004). **Effect of dental floating on weight gain, body condition score, feed digestibility, and fecal particle size in pregnant mares.** *Journal of the American Veterinary Medical Association* 225(12): 1889-1893. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: horses, pregnant mares, nutrition, dentistry, floating teeth, body condition score.

Clarke, J.V., C.J. Nicol, R. Jones, and P.D. McGreevy (1996). **Effects of observational learning on food selection in horses.** *Applied Animal Behaviour Science* 50(2): 177-184. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, learning, behavior patterns, feeding preferences.

Clarke, C.J., P.L. Roeder, and P.M. Dixon (1996). **Nasal obstruction caused by nutritional osteodystrophia fibrosa in a group of Ethiopian horses.** *The Veterinary Record* 138(23): 568-570. ISSN: 0042-4900.

NAL Call Number: 41.8 V641

Abstract: A severe, advanced case of nutritional osteodystrophia fibrosa is described in a 10-year-old gelding with primary upper respiratory obstruction and chronic weight loss, which was one of a group of similarly affected horses in Ethiopia. The diagnosis was based on the clinical signs, gross lesions, histopathology and management history. The affected bones had suffered severe mineral depletion.

Descriptors: bone diseases, nasal obstruction, vitamin D deficiency, osteodystrophia fibrosa, gelding, upper respiratory obstruction, weight loss, Ethiopia.

Coenen, M. (1998). **Beurteilung des Ernährungszustandes von Pferden und Rindern im Rahmen amtstierärztlicher Massnahmen. [Review of nutritional conditions of horses and cattle as a tool in veterinary services animal welfare procedures].** *Deutsche Tierärztliche Wochenschrift* 105(3): 124-127. ISSN: 0341-6593.

NAL Call Number: 41.8 D482

Abstract: The control of husbandry by veterinarians with the prospect of animal welfare demands a valuation of the nutritional status of farm animals. The situation of main importance is a suspected undernutrition. A prolonged failure in nutrient and energy supply results in mobilisation of body fat as well as body protein. Especially the protein depletion includes a loss of capacity of several essential functions, e.g. of the immune

system or the respiratory tract. Undernutrition is often classified as stress, but the typical parameters for stress related reactions offer no sufficient information to evaluate a case of undernutrition. A useful tool to justify the nutritional status of an animal is the amount of body fat by sonographic measurements. Processes related to reproduction are rather sensible to a reduction of body fat; although they are less expensive by energy point of view compared to exercise or milk production. Measuring body fat offers the opportunity to describe the degree of undernutrition and to appreciate, if a malnourished animal is damaged accordingly the definitions of animal welfare. However, the equipment and the experience to use sonographic methods is often not available for veterinarians, who are responsible in official control of husbandry. But the visual and manual procedures to proof defined areas, mainly related to back fat thickness, well known as the body condition scoring, alternatively can be used. The body condition score systems, as defined for cows, sheep and horses, are proofed by different experiments with regard to accuracy and reproducibility. They completely cover the demand in precision to evaluate body fat and in consequence the nutritional status of an animal.

Descriptors: animal husbandry, animal welfare, body condition score, cattle, horses, nutritional status, health status, veterinary medicine, malnutrition, protein depletion.

Language of Text: German.

Cooper, J.J., N. McCall, S. Johnson, and H.P.B. Davidson (2005). **The short-term effects of increasing meal frequency on stereotypic behaviour of stabled horses.** *Applied Animal Behaviour Science* 90(3-4): 351-364. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: feeding frequency, stereotyped behavior, feed concentrates.

Dacre, I. (2005). **The impact of nutrition on dental health and management of equine teeth for optimal nutrition.** In: *Applied Equine Nutrition 1st Equine Nutrition Conference ENUCO, October 1, 2005-October 2, 2005, Hannover, Germany*, p. 27-41.

Descriptors: animal nutrition, dental caries, dental health, dentistry, dentition, diet, digestibility, mastication, reviews, teeth, tooth diseases, horses.

De La Rua Domenech, R., H.O. Mohammed, J.F. Cummings, T.J. Divers, A. De Lahunta, and B.A. Summers (1997). **Intrinsic, management, and nutritional factors associated with equine motor neuron disease.** *Journal of the American Veterinary Medical Association* 211(10): 1261-1267. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: equine motor neuron disease (EMND), intrinsic elements, nutrition risk factors, oxidative stress as a risk factor, epidemiology, age and breed effects, rabies vaccination effects, feeding practices, exercise, grass paddocks, vitamin E, selenium.

Doxey, D.L., S. Tothill, E.M. Milne, and Z. Davis (1995). **Patterns of feeding and behaviour in horses recovering from dysautonomia (grass sickness).** *The Veterinary Record* 137(8): 181-183. ISSN: 0042-4900.

NAL Call Number: 41.8 V641

Descriptors: horses, digestive disorders, nervous system diseases, animal diseases, feeding habits, behavior, behavior, disorders, functional disorders, organic diseases, grass-sickness, dysautonomia.

Drogoul, C., A. de Fombelle, and V. Julliard (2001). **Feeding and microbial disorders in horses. 2. Effect of three hay:grain ratios on digesta passage rate and digestibility in ponies.** *Journal of Equine Veterinary Science* 21(10): 487-491. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, fiber, digestibility, digesta passage rate, transit time, hay:grain ratios, barley, feeding disorders.

Durham, A.E. (2006). **Clinical application of parenteral nutrition in the treatment of five ponies and one donkey with hyperlipaemia.** *The Veterinary Record* 158(5): 159-164. ISSN: 0042-4900.

Online: www.bvapublications.com

Descriptors: horses, donkeys, hyperlipaemia, clinical conditions, lipid-free partial parenteral nutrition, glucose, amino acids, energy, triglyceride concentration, clinical response.

Durham, A.E., T.J. Phillips, J.P. Walmsley, and J.R. Newton (2004). **Nutritional and clinicopathological effects of post operative parenteral nutrition following small intestinal resection and anastomosis in the mature horse.** *Equine Veterinary Journal* 36(5): 390-396. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, nutrition, colic surgery, parenteral nutrition, intestinal resection.

Durham, A.E., T.J. Phillips, J.P. Walmsley, and J.R. Newton (2003). **Study of the clinical effects of postoperative parenteral nutrition in 15 horses.** *The Veterinary Record* 153(16): 493-498. ISSN: 0042-4900.

NAL Call Number: 41.8 V641

Abstract: Several clinical variables were compared in two groups of 15 horses recovering from resection and anastomosis of a strangulated small intestine; 15 were treated with parenteral nutrition and 15 were starved routinely. There was some evidence that parenteral nutrition had a short-lived adverse effect on both the catheter sites and gastric emptying, but there were no marked adverse clinical effects and no evidence of any improvement in the horses' condition.

Descriptors: abdomen, anastomosis, parenteral nutrition, horse diseases, laparoscopy, postoperative complications, treatment outcome.

Ewing, R.A. (1997). *Beyond the Hay Days: A Refreshingly Simple Guide to Effective Horse Nutrition*, 1st edition, PixyJack Press: LaSalle, Colorado, USA, 128 p. ISBN: 0965809803.

NAL Call Number: SF285.5.E97 1997

Descriptors: horses, feeding and feeds, horses nutrition.

Feige, K., A. Furst, and M.W. Eser (2002). **Auswirkungen von haltung, futterung und nutzung auf die pferdegeseundheit unter besonderer berucksichtigung respiratorischer und gastrointestinaler krankheiten. [Influences of environment, feeding and use on equine health with emphasis on respiratory and gastrointestinal diseases].** *Schweizer Archiv Fuer Tierheilkunde* 144(7): 348-355. ISSN: 0036-7281.

NAL Call Number: 41.8 SCH9

Descriptors: horses, hypersensitivity of respiratory tract to fungi and thermophil aktinomyces, chronic obstructive pulmonary disease (COPD), feeding practices, equine health, dental problems in horses, gastric ulcers, colic, Switzerland.

Language of Text: German.

Fuller, Z., J.E. Cox, and C. M. Argo (2001). **Photoperiodic entrainment of seasonal changes in the appetite, feeding behaviour, growth rate and pelage of pony colts.** *British Society of Animal Science* 72(pt.1): 65-74. ISSN: 1357-7298.

NAL Call Number: SF1.A56

Abstract: Relationships among photoperiod and changes in voluntary food intake, feeding behaviour, growth and pelage were determined in seven, 2-year-old pony colts (182.4 (s.e. 5.4) kg). Individually housed colts were provided with ad libitum access to a complete pelleted diet (gross energy = 16.7 MJ/kg dry matter). Voluntary food intake (VFI, kg/day) was calculated daily and body weights were recorded weekly throughout the 36-week study. Feeding behaviour was evaluated at approximately 4-week intervals by continuous observation (24 h), and the hair weight density (HWD, mg/cm²) of shoulder pelage was determined fortnightly. Day length was artificially manipulated to mimic the prevailing mid-summer photoperiod (16 h light:8 h dark, 16L:8D). After 1 week of the study (and the preceding fortnight), day length was abruptly decreased and thereafter animals were exposed to alternating 14-week periods of short (SD, 8L:16D) and long days (LD, 16L:8D). The mean daily VFI of individual ponies was calculated weekly and normalized for digestible energy (DE) content and metabolic body weight (DEI, MJ/kg M^{0.75}). The average daily gain (ADG, kg/day) in body weight of each individual was calculated weekly. The apparent digestibility of dietary energy (digestibility) was determined over 72 h (no. = 6) on two occasions (days 92 to 95 and 190 to 193) during the study. Digestibility was similar in both periods (0.48, s.e. 0.01). DEI, ADG and HWD changed in a cyclic manner throughout the study. The period of the appetite cycle (24.4 (s.e. 1.3) weeks) did not differ from that of the 28-week photoperiodic regime. DEI decreased from a maximum of 1.4 (s.e. 0.03) MJ/kg M^{0.75} per day (day. 21), to a nadir of 0.75 (s.e. 0.02) MJ/kg M^{0.75} per day (day 154, P < 0.001) and had increased (P < 0.001) to attain a second zenith (0.93 (s.e. 0.01) MJ/kg M^{0.75} per day) before the end of the study. Ponies ate discrete meals of similar duration, but meal

frequency was associated with changes in VFI ($r = 0.77$) as was proportion of time spent feeding ($r = 0.79$). Changes in ADG reflected those of DEI. Body weight was stable for 4 weeks at the nadir of the appetite cycle. Maximal HWD was coincident with the nadir of the appetite and growth cycles. Regression of individual values for DEI on ADG described a linear relationship ($R^2 = 0.80$) which could be used to predict the energy requirements of growing ponies maintained under similar conditions: $DEI(\text{total}) (\text{MJ/kg M}^{0.75} \text{ per day}) = 0.654\text{ADG} (\text{kg/day}) + 0.789$. The duration of the photoperiod, appetite, growth and pelage cycles were similar, suggesting a causal relationship. Physiological responses to photoperiodic change were not immediate and exhibited a delay of 5 to 8 weeks.

Descriptors: colts, photoperiod, appetite, voluntary intake, energy intake, feeding frequency, duration, coat, seasonal variation, hair, weight, density.

Hall, J.O. (2001). **Toxic feed constituents in the horse.** *Veterinary Clinics of North America, The Equine Practice* 17(3): 479-489. ISSN: 0749-0739.

NAL Call Number: SF951.V47

Abstract: Poisoning cases in horses associated with dietary exposures can encompass a wide variety of etiologies that can be caused by natural or man-made components. Feed mixing errors and ingestion of feed formulated for other species are the most common means by which poisonings from man-made materials occur. Ionophore feed additives and antibacterial agents are especially toxogenic to horses. Effects of ionophores in horses include clinical, clinicopathologic, and pathologic changes associated with cardiac, muscular, and neurologic tissues involvement. The acute effects of ionophores, however, can result in long-term cardiac dysfunction. Antibacterial effects are associated with changed microbial populations in the digestive tract that results in bacterial toxin liberation. These bacterial toxins damage the mucosa, and they result in systemic effects. For either type of feed-associated poisoning, it is critical that samples be analyzed for an accurate diagnosis.

Descriptors: animal feed associated poisoning, feed mixing errors, ionophore feed additives, antibacterial agents added to feed, toxicity, cardiac dysfunction, bacterial toxins, sample analysis.

Harris, P. (2005). **Feeding the endurance horse.** In: *Applied Equine Nutrition. 1st Equine Nutrition Conference ENUCO, October 1, 2005-October 2, 2005, Hannover, Germany*, p. 61-84.

Descriptors: animal nutrition, electrolytes, energy intake, energy requirements, horse feeding, nutrient requirements, racehorses, vitamin supplements, water intake, horses.

Harris, P. (2005). **Nutrition, behaviour and the role of supplements for calming horses: the veterinarian's dilemma.** *Veterinary Journal* 170(1): 10-11. ISSN: 1090-0233.

NAL Call Number: SF601.V484

Descriptors: horses, behavior, nutrition, veterinary medicine, dietary supplements, stress, calming methods.

Harris, P. (1997). **Energy sources and requirements of the exercising horse.** *Annual Review of Nutrition* 17: 185-210. ISSN: 1545-4312.

NAL Call Number: QP141.A1A63

Descriptors: energy requirements for horses, equine diets, literature review, maintenance and energy, calculating available energy in diets.

Holland, J.L., D.S. Kronfeld, and T.N. Meacham (1996). **Behavior of horses is affected by soy lecithin and corn oil in the diet.** *Journal of Animal Science* 74(6): 1252-1255. ISSN: 1525-3163.

NAL Call Number: 49 J82

Descriptors: dietary fats, tractibility of horses, behavioral observations, pedometer, reactivity, reduction in activity and reactivity of horses.

Hussein, H.S. and L.A. Vogedes (2003). **Review: Forage nutritional value for equine as affected by forage species and cereal grain supplementation.** *Professional Animal Scientists* 19(5): 388-397. ISSN: 1080-7446.

NAL Call Number: SF51.P76

Descriptors: horses, forage evaluation, forage quality, forage composition, literature reviews.

Hyslop, J.J., G.J. Stefansdottir, B.M.L. McLean, A.C. Longland, and D. Cuddeford (1999). **In situ incubation sequence and its effect on degradation of food components when measured in the caecum of ponies.** *British Society of Animal Science* 69(pt. 1): 147-156. ISSN: 1357-7298.

NAL Call Number: SF1.A56

Abstract: Three experiments were conducted to investigate the effect of bag incubation sequence on the degradation of food components in situ in the caecum of mature, caecally fistulated Welsh-cross pony geldings (mean live weight 278 kg) offered hay ad libitum. In experiment 1 a fibre-based commercial horse concentrate was incubated in situ using a forward (3, 5, 16, 8, 24, 48 h) or reverse (48, 24, 8, 16, 5, 3 h) incubation sequence. Dry matter (DM), crude protein (CP), neutral-detergent fibre (NDF) and acid-detergent fibre (ADF) degradation coefficients and calculated effective degradability (ED) values were determined. In experiment 2 unmolassed sugar-beet pulp (USBP), hay cubes (HC), soya hulls (SH) and a 2:1 mixture of oat hulls:naked oats (OHNO) were incubated in situ as for experiment 1. In experiment 3 unprocessed barley (UB), micronized barley (MB), extruded barley (EB) and dehydrated grass (DHG) were incubated in situ according to slightly different forward or reverse incubation sequences of (2, 4, 6, 12, 8, 24, 48 h) and (48, 24, 8, 4, 12, 6, 2 h) respectively. In experiments 2 and 3 only DM degradation parameters were studied. Of the three starch-based foods studied in experiment 3 (UB, MB and EB), incubation sequence did not significantly ($P > 0.05$) affect any of the degradation parameters examined. Conversely however, of the six fibre-based foods which were examined across the three experiments, incubation sequence did significantly ($P < 0.05$) affect in situ degradation parameters in the commercial horse concentrate in experiment 1, the SH food in experiment 2 and the DHG food in experiment 3. Depending on the food or food constituent studied (i.e. DM, CP, NDF or ADF) degradation coefficients. a, b, c and a + b along with ED values calculated at fractional outflow rates of 0.05 and 0.025 could all be statistically different ($P < 0.05$) according to whether a forward or reverse incubation sequence was used. It is postulated that this effect is related to the basic digestive physiology of the equine caecum which is small, digesta passage rate through it is fast and digesta volumes can vary considerably. These factors may interact to create a considerable degree of non-uniformity within the caecal digesta pool in which in situ bags are incubated. Consequently, it is recommended that in future in situ experiments in the equine hindgut, animals are offered ad libitum diets in an attempt to minimize variation within the caecum. It is also recommended that in situ experimental protocols incorporate more than one incubation sequence when the degradation parameters of fibrous foods are studied in equids.

Descriptors: horses, cecum, hay, concentrates, biodegradation, fiber content, beet pulp, soybean husks, oats, husks, barley, extrusion, grasses, digestion, dry matter, protein content, crude protein, methodology.

Jordan, R.M. (1995). *Horse Nutrition and Feeding*, Extension Service State Agriculture: St. Paul, Minnesota, USA, 13 p.

NAL Call Number: S451.M6M582

Descriptors: horse feed rations, digestive system, feeds, dry matter content, total digestible nutrients, energy value, differences in nutrient requirements during developmental stages, feed formulations, grazing, feeding behavior, nutritive value, level of activity, feed requirements.

Jose Cunilleras, E., K.W. Hinchcliff, V.A. Lacombe, R.A. Sams, C.W. Kohn, L.E. Taylor, and S.T. Devor (2006). **Ingestion of starch-rich meals after exercise increases glucose kinetics but fails to enhance muscle glycogen replenishment in horses.** *Veterinary Journal* 171(3): 468-77.

Descriptors: muscle glycogen concentration, athletic performance, whole body glucose kinetics, glycogen metabolism, horses metabolism, insulin levels.

Julliand, V. (2005). **Impact of nutrition on the microflora of the gastro-intestinal tract in horses.** In: *Applied Equine Nutrition 1st Equine Nutrition Conference ENUCO, October 1, 2005-October 2, 2005, Hannover, Germany*, p. 85-103.

Descriptors: diet, digestive tract, feed additives, microbial flora, probiotics, reviews, horses.

Julliand, V., A. de Fombelle, C. Drogoul, and E. Jacotot (2001). **Feeding and microbial disorders in horses. 3. Effects of three hay:grain ratios on microbial profile and activities.** *Journal of Equine Veterinary Science* 21(11): 543-546. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, horse feeding, hay, barley, ratios, digesta, cecum, colon, intestinal microorganisms, bacteria, pH, lactic acid, volatile fatty acids.

Karlsson, C.P., J.E. Lindberg, and M. Rundgren (2000). **Associative effects on total tract digestibility in horses fed different ratios of grass hay and whole oats.** *Livestock Production Science* 65(1/2): 143-153. ISSN: 0301-6226.

NAL Call Number: SF1.L5

Descriptors: oats, grass hay, digestibility, hay:oat ratios, feeds, dry matter, digestible energy, nutrient availability, urine analysis, digestive tract.

Kempson, S.A. (2005). **Nutritional management of horses with hoof diseases.** In: *Applied Equine Nutrition 1st Equine Nutrition Conference ENUCO, October 1, 2005-October 2, 2005, Hannover, Germany*, p. 105-112.

Descriptors: animal nutrition, diet, foot diseases, hooves, lameness, laminitis, reviews, horses.

Kienzle, E., K. Sturmer, D. Ranz, and M. Clauss (2006). **A high roughage/concentrate ratio decreases the effect of ammonium chloride on acid-base balance in horses.** *Journal of Nutrition* 136(7 Suppl.): 2048s-2049s.

Descriptors: diet composition, hydrogen ion concentration, pharmacology, acid base equilibrium, ammonium chloride.

Kolarova, S. and B. Cermak (1997). **Zasady Krmeni Koni. [Basic Principles of Horse Feeding]**, Institut Vychovy a Vzdělávání MZe: Prague, Czech Republic, 25 p. ISBN: 8071051497.

Descriptors: draught horses, mares, foals, stallions, racehorses, animal feeding, roughage, grain feed, feed additives, proximate composition, age, seasons, feed intake, additives, feeding behavior, feeding habits, feeds.

Language of Text: Czech.

Lauk, H.D., B. Huskamp, and E. Deegen (2005). **Proceedings Equine Nutrition Conference, Hannover, Germany, 1-2 October, 2005.** *Pferdeheilkunde* 21: 132. ISSN: 0177-7726.

Descriptors: animal nutrition, bone diseases, bones, carbohydrates, colostrum, enzymes, exercise, feed additives, feed formulation, feed supplements, fermentation, foals, in vitro digestibility, milk composition, milk quality, nutrient requirements, nutrition physiology, nutritive value, osteochondritis, racehorses, racing performance, rest, seasonal variation, horses.

Lawrence, L.M. (2005). **Feeding more and getting less: effects of high grain intakes on digestive capacity and gastrointestinal health of performance horses.** In: *Advances in Equine Nutrition III*, p. 227-233.

Descriptors: calories, digestive system, energy balance, energy consumption, feed grains, horse feeding, racehorses, reviews, horses.

Lopes, M.A.F. and N.A. White II (2002). **Parenteral nutrition for horses with gastrointestinal disease: A retrospective study of 79 cases.** *Equine Veterinary Journal* 34(3): 250-257. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, gastrointestinal diseases, parenteral feeding, nutritional support, prognosis, complications, costs, clinical aspects, parenteral nutrition.

Magdesian, K.G. (2003). **Nutrition for critical gastrointestinal illness: Feeding horses with diarrhea or colic.** *Veterinary Clinics of North America, The Equine Practice* 19(3): 617-644. ISSN: 0749-0739.

NAL Call Number: SF951.V47

Abstract: Horses with GI diseases such as colic and diarrhea are often intolerant of adequate enteral nutrition. Nutritional intervention should be an early part of therapeutic management in such cases. Protein and energy malnutrition in critically ill horses can have deleterious effects, including poor wound or incisional healing, reduced immunity, and weight loss. Early enteral or parenteral support should be provided to supply resting DE requirements in the equine ICU.

Descriptors: animal nutrition, colic, diarrhea, enteral nutrition, horses, nutritional requirements, nutritional status, parenteral nutrition, gastrointestinal diseases, protein and energy malnutrition.

McKellar, Q.A. and L.J.I. Horspool (1995). **Stability of penicillin G, ampicillin, amikacin and oxytetracycline and**

their interactions with food in in vitro simulated equine gastrointestinal contents. *Research in Veterinary Science* 58(3): 227-231. ISSN: 0034-5288.

NAL Call Number: 41.8 R312

Abstract: Penicillin G was extensively (84.7 per cent) and amikacin moderately (14.4 per cent) degraded when incubated for one hour in a chloride buffer at pH 1.9 designed to mimic the equine gastric pH. Ampicillin and oxytetracycline were stable at pH 1.9. Penicillin and ampicillin were moderately stable (more than 90 per cent) when incubated in equine caecal liquor for three hours but were degraded by about 65 per cent after 24 hours. More than 80 per cent of the initial concentrations of amikacin and oxytetracycline were recovered after 24 hours' incubation in equine caecal liquor. The concentrations of short chain fatty acids in equine caecal liquor were not affected by incubation with penicillin G, ampicillin, amikacin or oxytetracycline. More than 84 per cent of penicillin G and amikacin became bound to hay in buffers at pH 1.9 and pH 7.0. Ampicillin did not become bound to hay at pH 1.9, but more than 60 per cent became bound at pH 7.0.

Descriptors: horses, penicillins, ampicillin, kanamycin, oxytetracycline, drug-food interactions, digestive juices, gastric acid, cecum, in vitro simulation, short chain fatty acids, hay, gastric pH, simulated digesta, cecal liquor, simulated gastrointestinal contents.

Menard, C., P. Duncan, G. Fleurance, J.Y. Georges, and M. Lila (2002). **Comparative foraging and nutrition of horses and cattle in European wetlands.** *Journal of Applied Ecology* 39(1): 120-133. ISSN: 0021-8901.

NAL Call Number: 410 J828

Descriptors: horses, cattle, species coexistence, grazing patterns, pasture management, foraging behavior.

Milnovich, G.J., D.J. Trott, P.C. Burrell, A.W. Van Eps, M.B. Thoenner, L.L. Blackall, R.A.M. Al Jassim, J.M. Morton, and C.C. Pollitt (2006). **Changes in equine hindgut bacterial populations during oligofructose-induced laminitis.** *Environmental Microbiology* 8(5): 885-898. ISSN: 1462-2912.

Descriptors: causes of laminitis, microbial ecology, oligofructose-utilizing organisms, induction of laminitis, fecal samples, presence of *Streptococcus* sp.

Monahan, C.M., M.R. Chapman, H.W. Taylor, D.D. French, and T.R. Klei (1998). **Experimental cyathostome challenge of ponies maintained with or without benefit of daily pyrantel tartrate feed additive: comparison of parasite burdens, immunity and colonic pathology.** *Veterinary Parasitology* 74(2-4): 229-241. ISSN: 0304-4017.

NAL Call Number: SF810.V4

Abstract: Eighteen mixed-breed, naturally infected ponies ranging in age from 1 to 16 yr and four cyathostome-naïve ponies reared and maintained under parasite-free conditions ranging in age from 1 to 4 yr were used in this study. Naturally-infected ponies were treated with 1 dose of ivermectin (IVM) at 200 micrograms kg⁻¹, followed by a 5-day regimen of oxibendazole (OBZ) at 20 mg kg⁻¹ to remove existing cyathostome burdens; cyathostome-naïve control ponies were treated with IVM alone. The naturally infected ponies were matched on age and gender, then randomly assigned to one of three treatment groups of six animals per group; the four cyathostome-naïve ponies constituted a fourth group. Following OBZ treatment, Group 1 ponies were treated with pyrantel tartrate (PT) in their pelleted ration; the remaining ponies received only the pelleted ration. Beginning on experiment Day 3, a daily challenge infection of 10(4) mixed cyathostome larvae was administered orally to ponies of Group 1, Group 2 and the cyathostome-naïve controls. Group 3 ponies served as unchallenged controls to determine residual parasite burdens following IVM/OBZ treatment. Necropsy examinations were performed on three Group 3 ponies on Day 1; the remainder of the necropsy examinations began on Day 41. Cyathostome burdens were evaluated by recovery of larvae and adults from the luminal contents, by digestions of the intestinal mucosa, and by mural transillumination of full-thickness intestinal sections. Differences in postchallenge clinical responses were also compared. Necropsy examinations included comparisons of grossly visible inflammation of the large bowel, weights of biopsy specimens from each region, and histologic evaluations of these biopsies. Parasite recoveries at necropsy indicated a strong protective effect derived from daily PT treatment. Mean weights of intestinal biopsies corresponded with worm burdens, but histological evaluation did not reveal architectural or cellular changes to account for the increase in weight; therefore, edema was suspected. A strong age-related resistance to challenge infection was apparent in both the PT-treated and control groups by virtue of the lower mean worm burdens found in older ponies compared to younger ponies of the same treatment group; however, daily PT treatment of older ponies reduced the variability

of their worm burdens to a uniformly low level. Comparisons of luminal and mucosal parasite burdens of age stratified nontreated controls further suggest that the age related resistance, which is acquired, targets increasing numbers of parasite stages as this resistance matures. Further, there is no evidence for an immune mediated acquisition of hypobiotic L3.

Descriptors: cyathostome, parasite load, ivermectin, oxbendazole, worming, pyrantel tartrate protective effect, worm burdens, age-related resistance to parasite infection.

Nash, D. (1999). *Drought Feeding for Horses*, Rural Industries Research and Development Corp, Equine Research and Development Program: Barton, Australia, 64 p. ISBN: 064257958X.

NAL Call Number: SF285.5.N373 1999

Descriptors: effect of drought on horses, Australia, feeding and feeds, nutritional status.

Notes: "Project no. DAV-156A".

Nielsen, B.D., G.D. Potter, L.W. Greene, E.L. Morris, M. Murray Gerzik, W.B. Smith, and M.T. Martin (1998).

Response of young horses in training to varying concentrations of dietary calcium and phosphorus.

Journal of Equine Veterinary Science 18(6): 397-404. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, training, calcium, phosphorus, mineral nutrition, nutrient intake, dosage, feed supplements, bone density, urine analysis, feces composition, blood chemistry, magnesium, nutrient balance.

Notes: Meeting Information: Paper presented at the Equine Nutrition and Physiology Society Annual Symposium, Fort Worth, Texas, USA; May 28-31, 1997.

Owens, E. (2005). **Sport horse nutrition - an Australian perspective.** In: *Advances in Equine Nutrition III*, p. 185-192.

Descriptors: animal nutrition, animal sports, body weight, feed intake, feeding frequency, feeds, horse feeding, nutrient deficiencies, reviews, horses.

Pagan, J.D. (2005). *Advances in Equine Nutrition III*, Nottingham University Press: England, UK, 503 p.

NAL Call Number: SF285.5.A39 2005

Descriptors: nutrition, feed management methods, development, diseases, effects of nutrition, exercise, immune system, musculoskeletal system, nutrition related performance disorders.

Pagan, J.D. (1999). **Recent developments in equine nutrition.** In: *61st Cornell Nutrition Conference for Feed Manufacturers, October 19, 1999-October 21, 1999, Rochester, New York, USA*, Departments of Poultry Husbandry, Animal Husbandry, and Biochemistry and Nutrition, New York State College of Agriculture, and the Graduate School of Nutrition, Cornell University, in cooperation with the American Feed Manufacturers' Association: New York, USA, Vol. 61st, p. 160-167.

NAL Call Number: 389.79 C81

Descriptors: horse feeding, feed grains, diet, processing, selenium, nutrient sources, dietary fat, exercise, digestion, blood sugar, responses, feeding, timing, saddle performance.

Pagan, J.D., P. Harris, T. Brewster-Barnes, S.E. Duren, and S.G. Jackson (1998). **Exercise affects digestibility and rate of passage of all-forage and mixed diets in Thoroughbred horses.** *Journal of Nutrition* 128(12): 2704S-2707S. ISSN: 0022-3166.

NAL Call Number: 389.8 J82

Descriptors: Thoroughbred horses, geldings, digestibility, exercise effects, rate of passage, forage.

Perrone, G., J. Caviglia, R. Jimenez, M. Chiappe, and G. Gonzalez (2005). **Comparacion de la tolerancia al almidon del grano de avena en equinos alimentados con pasturas y dietas mixtas. [Comparison between equine tolerance of oats grain starch in pasture and mixed diets].** *Revista De Medicina Veterinaria Buenos Aires* 86(1): 13-16. ISSN: 0325-6391.

Descriptors: oral starch tolerance test, oat grains, starch intestinal overload, glycemia, lactacidemia, pasture, concentrates, glycemic curves, lactacidemic curves.

Language of Text: Spanish with an English summary.

- Ralston, S.L. (2005). **Feeding dentally challenged horses.** *Clinical Techniques in Equine Practice* 4(2): 117-119. ISSN: 1534-7516.
Online: <http://www.sciencedirect.com/science/journal/15347516>
Descriptors: diet composition, roughages, concentrates, weight loss, malnutrition.
Notes: Special issue: *Equine Dentistry*.
- Ralston, S.L., D.L. Foster, T. Divers, and H.F. Hintz (2001). **Effect of dental correction on feed digestibility in horses.** *Equine Veterinary Journal* 33(4): 390-393. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, digestibility, dentistry, teeth, dry matter, crude protein, fiber, hay, feed grains, adverse effects, digestion.
- Smithurst, K.J., S. Armstrong, A. Waller, R.J. Geor, G.L. Ecker, and M.I. Lindinger (2003). **Feeding effects on plasma TCO₂ and blood/plasma electrolyte and acid-base state in horses over a 25-hour period.** *FASEB Journal* 17(4-5): Abstract # 89.2. ISSN: 0892-6638.
Online: <http://www.fasebj.org/>
NAL Call Number: QH301.F3
Descriptors: nutrition, blood chemistry, electrolytes, plasma TCO₂, acid-base and electrolyte status, Standardbred horses, traditional racehorse diet, blood sampling, meeting abstract.
Notes: Meeting Information: FASEB Meeting on Experimental Biology: Translating the Genome, San Diego, CA, USA; April 11-15, 2003.
- Todd, L.K., W.C. Sauer, R.J. Christopherson, R.J. Coleman, and W.R. Caine (1995). **The effect of feeding different forms of alfalfa on nutrient digestibility and voluntary intake in horses.** *Journal of Animal Physiology and Animal Nutrition* 73(1): 1-8. ISSN: 0044-3565.
NAL Call Number: 389.78 Z3
Descriptors: geldings, lucerne, pellets, briquettes, nutrients, digestibility, formulations, feed intake, behavior, feeding habits, feeds, formulations, green feed, nutritive value, quality.
- Todd, L.K., W.C. Sauer, R.J. Christopherson, R.J. Coleman, and W.R. Caine (1995). **The effect of level of feed intake on nutrient and energy digestibilities and rate of feed passage in horses.** *Journal of Animal Physiology and Animal Nutrition* 73(3): 140-148. ISSN: 0044-3565.
NAL Call Number: 389.78 Z3
Descriptors: horses, feeding level, nutrients, digestibility, energy value, flow rate, tracer techniques, feces, excreta, feeding, fluid flow, fluid mechanics, nutritive values.
- United States. Animal and Plant Health Inspection Service. Veterinary Services. Centers for Epidemiology and Animal Health. National Animal Health Monitoring System. (2000). **Fumonsin B1 Mycotoxin in Horse Grain/Concentrate on U.S. Horse Operations**, U.S. Department of Agriculture: Fort Collins, Colorado, USA, 2 p.
Online: <http://www.aphis.usda.gov/vs/ceah/cnahs/nahms/equine/Equine98/eq98fumonisin.pdf>
NAL Call Number: aSF757.5.F86 2000
Descriptors: fumonsins, mycotoxins, feeds contamination, United States.
- Voros, K. and S. Fekete (2002). **A lovak dietas taplalasa. Indokok es lehetosegek. [Dietary nutrition of horses. Reasons and opportunities].** *Magyar Allatorvosok Lapja* 124(1): 11-18. ISSN: 0025-004X.
NAL Call Number: 41.8 V644
Descriptors: nutrition for compromised horses, dietary nutrition, disease specific nutrition, digestion physiology, rules of nutrition according to each disease.
Language of Text: Hungarian.
- Wilson, J.H. and D.A. Fitzpatrick (2004). **How to manage starved horses and effectively work with humane and law enforcement officials.** In: *Proceedings of the 50th Annual Convention of the American Association of Equine Practitioners, December 4, 2004-December 8, 2004, Denver, Colorado, USA*, p. 429-432.

Online: <http://www.aaep.org>

Descriptors: animal nutrition, animal welfare, horse feeding, plane of nutrition, refeeding, starvation, horses.

Wyse, C.A., D.M. Murphy, T. Preston, D.G. Sutton, D.J. Morrison, R.M. Christley, and S. Love (2001). **The(13)C-octanoic acid breath test for detection of effects of meal composition on the rate of solid-phase gastric emptying in ponies.** *Research in Veterinary Science* 71(1): 81-83. ISSN: 0034-5288.

NAL Call Number: 41.8 R312

Abstract: The aim of this study was to apply the(13)C-octanoic acid breath test for detection of alterations in the rate of solid-phase gastric emptying, induced by changes in test meal composition, in ponies. After a 14 hour fast the ponies (n = 4) ingested a test meal with 0, 35 or 70 ml soya oil, and labelled with 250 mg(13)C-octanoic acid. Each pony was given each of the three test meals on three separate occasions, in a randomised order. Exhaled breath samples were collected for 12 hours after ingestion of the test meal. Breath samples were analysed by continuous flow isotope ratio mass spectrometry. Three indices of breath(13)C-enrichment were computed, half-dose recovery time (t 1/2), gastric emptying coefficient (GEC) and time to peak breath(13)C-excretion t(max). The(13)C-octanoic acid breath test was a reliable means of assessing the significantly decreased rate of gastric emptying in the pony, associated with addition of soya oil to the test meal.

Descriptors: gastric emptying, octanoic acids, animal feed, breath tests, carbon isotopes, cross over studies, horse metabolism, soya oil, C-octanoic acid.

Zentek, J., S. Aboling, and J. Kamphues (1999). **Fallbericht: Tierernahrung fur Tierarzte--aktuelle Falle: Hundszunge (*Cynoglossum officinale*) im Weideaufwuchs--ein Risiko fur die Gesundheit von Pferden. [Accident report: Animal nutrition in veterinary medicine--actual cases: houndstongue (*Cynoglossum officinale*) in pasture--a health hazard for horses].** *Deutsche Tierarztliche Wochenschrift* 106(11): 475-477. ISSN: 0341-6593.

NAL Call Number: 41.8 D482

Abstract: Meteorism and colics were observed in horses after grazing on young pasture. The botanical analysis of a sample as taken by the owner revealed a great diversity of grasses, herbs and legumes. Houndstongue (*Cynoglossum officinale*) in its rosette stage was identified in amounts of 1% of the total sample, although this cannot be regarded as representative for the composition of the green fodder. This plant has been reported to be highly toxic for horses and other species, mainly during the early growth stadium due to its contents of pyrrolizidin alkaloids with a strong hepatotoxic activity. In the present case it remained unclear, whether the horses actually ingested this poisonous plant in relevant amounts. In general it has to be emphasised, that a contamination especially of hay or silage bears a severe risk for horses. The contamination of green fodder with houndstongue can be a serious problem for the feeding practice in certain regions (dry grassland, loess or shell lime soil, extensive management).

Descriptors: houndstongue, *Cynoglossum officinale*, toxic plants found in pastures, pasture health, horse health and nutrition, toxicity, hay or silage contamination, colic, young pasture, meteorism.

Language of Text: German.

Zeyner, A., C. Geissler, and A. Dittrich (2004). **Effects of hay intake and feeding sequence on variables in faeces and faecal water (dry matter, pH value, organic acids, ammonia, buffering capacity) of horses.** *Journal of Animal Physiology and Animal Nutrition* 88(1-2): 7-19. ISSN: 0931-2439.

Descriptors: horses, feeding practices, hay intake, feeding sequence, digestive system, fecal content.

Zeyner, A., M. Roepke, A. Schindler, J. Bessert, A. Dittrich, J. Gropp, and M. Krueger (1997). **Untersuchungen zur Fuetterungsabhaengigkeit der Konzentration an freiem Endotoxin in Kotwasser und Blutplasma von Pferden. [Investigations on free endotoxine in faecal water and blood of horses in respect of feeding].** In: *Proceedings of the Society of Nutrition Physiology, Leipzig University, Germany, Frankfurt, Germany, Vol. 6*, p. 64. ISBN: 3769040902.

Descriptors: horses, feces, water, blood plasma, endotoxins, starch, soybean oil, rapeseed oil, rations, lipid content, blood serum, foot diseases, bacterial toxins, blood, carbohydrates, excreta, glucans, oils, organic diseases, plant oils, polysaccharides, processed plant products, processed products, proximate composition, soybean products, toxic substances, toxins.

Language of Text: German.

Descriptors: abdomen, anastomosis, parenteral nutrition, horse diseases, laparoscopy, postoperative complications, treatment outcome.

Nutrition -- Web Resources

Equine Nutrition Research Updates - UK Animal & Food Sciences.

Online: <http://www.uky.edu/Agriculture/AnimalSciences/equine/equineresearchupdates.html>

Description: Links to current journal articles on equine nutrition research.

Horse Nutrition, Bulletin 762-00, Carbohydrates and Fats.

Online: http://ohioline.osu.edu/b762/b762_7.html

Description: Discusses carbohydrate and fat content as well as the nutritional value of various roughages and concentrates.

Horse Nutrition, Bulletin 762-00, Protein.

Online: http://ohioline.osu.edu/b762/b762_8.html

Description: Provides protein needs based on horses' size, age, and use. Also includes various sources of protein that can be included in an equine diet.

Winter Energy Needs in Horses. Michigan State University. College of Veterinary Medicine.

Online: <http://old.cvm.msu.edu/news/Press/eqfoodwn.htm>

Description: Feeding method to maintain horse health and condition during the colder winter season.

Basics of Feeding Horses: Reading the Feed Tag, G00-1403-A. Anderson, K.

Online: <http://ianrpubs.unl.edu/horse/g1403.htm>

Description: Explains the function of essential nutrients and how to interpret the tag on commercial horse feeds.

The Impact of Nutrition and Feeding Practices on Equine Behaviour and Welfare. Davidson, H.P.B.

Online: <http://www3.vet.upenn.edu/labs/equinebehavior/hvnwkshp/hv02/davidson.htm>

Description: Effect of nutritional management on equine well being. Discusses both beneficial and detrimental practices.

Alternative Feeds for Horses. Kruse, K.

Online: <http://agbiopubs.sdstate.edu/articles/ExEx2039.pdf>

Description: Cost effective nutrition and details the use of roughage and grain alternatives.

Feeding Mangement for Horse Owners. Lardy, G. and C. Poland.

Online: <http://www.ext.nodak.edu/extpubs/ansci/horse/as953w.htm>

Description: Presents feeding practices tailored to the anatomy of the equine digestive tract. Details amounts and quality of roughages and concentrates to feed horses based on weight and workload, as well as the effects of dental health, supplement administration, and ration alteration.

Nutrient Requirements and Balancing Rations for Horses. Lawrence, L.A.

Description: Feeding rules, methods for balancing rations, specific ration calculation strategy, and condition evaluation chart.

Minerals in Equine Nutrition: Science and Application. Lawrence, L.

Online: <http://www.tennesseenutritionconference.org/pdf/Proceedings2005/LaurieLawrence.pdf>

Description: Mineral requirements for horses, practical methods of meeting these requirements, and comparison of apparent versus true mineral digestibility.

Decreasing the Cost of Feeding Horses. *McCall, C.A.*

Online: <http://www.aces.edu/pubs/docs/A/ANR-0849/>

Description: Details amounts of specific nutrients needed by horses based on age, physiological state, and size. Includes management strategies for cost effective feeding.

Equine Nutrition for Health and Happiness. *Veitch, A. and Susan C. Eades.*

Online: <http://evrp.lsu.edu/healthtips/EquineNutrition.htm>

Description: Guide to developing an equine nutrition program to enhance welfare and performance and avoid feed related ailments.

Horses Publications: The Basics of Equine Nutrition. *Williams, C.A.*

Online: <http://www.rcre.rutgers.edu/pubs/publication.asp?pid=FS038>

Description: Fact sheet describing equine nutritional needs based on nutrient category. Discusses forages and concentrates as well as food quality and supplementation.

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Last updated: October 25, 2011



Feeding Methods

Bergero, D., M. Tarantola, and B. Bassano (2000). **Approccio alimentare a fronte di manifestazioni di coprofagia in una scuderia di cavalli sportivi. [Feeding strategy for coprophagy events in a sport horses stable].**

Obiettivi e Documenti Veterinari (Italy) 21(2): 31-35. ISSN: 0392-1913.

NAL Call Number: QL750.E82

Abstract: The interest for oral and locomotory behaviour troubles in sport horses is increasing. Management faults, nutritional unbalances, excessive stress level can increase the incidence of these disorders. In this work we describe the effects of some practical feeding changes on the occurrence of coprophagy, in a sport horses stable where this disorder was widespread: 40 horses were present, of which 16 showed coprophagy. These 16 sport horses were divided into experimental groups (3 experimental groups in the first two experimental moments and 4 experimental groups in the third and last) with the aim of comparing the effect of different rations (in particular with no premix or different vitamins and trace elements premix levels). Feeding strategy showed a significant effect in the occurrence of coprophagy, even though other factors, not related to feeding, played an evident role. A vitamin and trace elements premix, added to the rations, decreased the frequency of coprophagy observation. This behaviour disorder can be evidently reduced in horses that show low frequency of occurrence by a proper premix, in particular using vitamins B1, B6, B12, folacin and vitamin C at high doses.

Descriptors: racehorses, abnormal behavior, coprophagia, excessive stress levels, management of horses, effects of nutrition on behavior, use of vitamins B1, B6, B12, folacin and vitamin C to reduce coprophagy, animal supplements, in vivo experimentation, nutritional disorders.

Language of Text: Italian.

Blackman, M. and M.J.S. Moore Colyer (1998). **Hay for horses: the effects of three different wetting treatments on dust and nutrient content.** *British Society of Animal Science* 66(3): 745-750. ISSN: 1357-7298.

NAL Call Number: SF1.A56

Descriptors: allergens, hay, horses, nutritive value, hydration, dust, steaming, minerals, carbohydrates, antigens, feeds, heat treatment, immunological factors, pollutants, processing, quality, roughage, nutrient content, wetting.

Brewster Barnes, T. (1995). *The effect of feeding after exercise on glucose and glycogen responses in the horse.*

Dissertation, University of Kentucky: Kentucky, USA. 98 p.

Descriptors: horses feeding and feeds, glucose, glycogen.

Notes: Thesis (M.S.)--University of Kentucky, 1995.

Buff, P.R., C.D. Morrison, V.K. Ganjam, and D.H. Keisler (2005). **Effects of short-term feed deprivation and melatonin implants on circadian patterns of leptin in the horse.** *Journal of Animal Science* 83(5): 1023-1032. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Leptin is a protein hormone produced by adipose tissue that influences hypothalamic mechanisms regulating appetite and energy balance. In species tested thus far, including horses, concentrations of leptin increase as animal fat mass increases. The variables and mechanisms that influence the secretion of leptin are

not well known, nor is it known in equine species how the secretion of leptin is influenced by acute alterations in energy balance, circadian patterns, and/or reproductive competence. Our objectives were to determine in horses: 1) whether plasma concentrations of leptin are secreted in a circadian and/or a pulsatile pattern; 2) whether a 48-h period of feed restriction would alter plasma concentrations of leptin, growth hormone, or insulin; and 3) whether ovariectomy and/or a melatonin implant would affect leptin. In Exp. 1, mares exposed to ambient photoperiod of visible light (11 h, 33 min to 11 h, 38 min), received treatments consisting of a 48-h feed restriction (RES) or 48 h of alfalfa hay fed ad libitum (FED). Mares were maintained in a dry lot before sampling and were tethered to a rail during sampling. Analyses revealed that leptin was not secreted in a pulsatile manner, and that mean leptin concentrations were greater ($P < 0.001$) in FED vs. RES mares (17.20 ± 0.41 vs. 7.29 ± 0.41 ng/mL). Plasma growth hormone was pulsatile, and mean concentrations were greater in RES than FED mares (2.15 ± 0.31 vs. 1.08 ± 0.31 ng/mL; $P = 0.05$). Circadian patterns of leptin secretion were observed, but only in FED mares (15.39 ± 0.58 ng/mL for morning vs. 19.00 ± 0.58 ng/mL for evening; $P < 0.001$). In Exp. 2, mares that were ovariectomized or intact received either a s.c. melatonin implant or a sham implant. Thereafter, blood was sampled at weekly intervals at 1000 and 1700. Concentrations of leptin in samples collected at 1700 were greater ($P < 0.001$) than in those collected at 1000 (28.24 ± 1.7 vs. 22.07 ± 1.7 ng/mL). Neither ovariectomy nor chronic treatment with melatonin affected plasma concentrations of leptin or the circadian pattern of secretion. These data provide evidence that plasma leptin concentrations in the equine are sensitive to acute changes in nutritional status and vary in a circadian pattern that is sensitive to fasting but not to melatonin treatment or ovariectomy.

Descriptors: horses, leptin, circadian patterns, plasma concentration.

Christensen, R.A., K. Malinowski, C.G. Scanes, and H.D. Hafs (1997). **Pulsatile release of somatotropin related to meal feeding and somatotropin response to secretagogues in horses.** *Journal of Animal Science* 75(10): 2770-2777. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Our goal was to establish a time of day and(or) interval from feeding that would avoid the refractory period after a somatotropin (ST) surge and optimize the responsiveness of horses to ST secretagogues. Two experiments were conducted with eight geldings conditioned to consume grain at 0800 and 1600 daily. In Exp. 1, during a 24-h period, these geldings averaged $3.2 \pm .3$ pulses of ST with peak amplitude of $4.2 \pm .4$ ng/mL, pulse duration of 55 ± 6 min, and interpeak interval of 400 ± 57 min. No ST peaks occurred within 2 h after either grain feeding. In Exp. 2, eight geldings were given 50 micrograms of ST-releasing factor (STRF) at 0800. Two geldings that had a pulse of ST between 0700 and 0800 failed to respond to STRF, but the other six responded with a pulse of ST at 37 ± 3 min; peak amplitude was 4.6 ± 2.2 ng/mL and duration was 123 ± 25 min. Experiments 3 and 4 were with mares aged 20 to 26 yr and conditioned to be fed grain at 0800 daily. In Exp. 3, blood was sampled for 8 h beginning at 0500. Seven of the eight mares had a ST pulse in progress at 0500. Five additional pulses were detected, all from 0740 to 0940, but none from 0600 to 0700 or from 1000 to 1300. In Exp. 4, four of the same eight mares were given 50 micrograms of STRF at 0700 and the other four at 1300. Three of the four treated at 0700 and all four treated at 1300 responded to STRF with ST peaks at 20 ± 5 min; peak amplitude was 12.7 ± 9.5 ng/mL and duration was 69 ± 6 min. In Exp. 5, nine mares aged 20 to 26 yr were fed grain at 0800 and 1600 as in Exp. 1 and 2 and given a nonpeptidal ST secretagogue (STS, Merck L-163,255) i.v. at 0, 1, or 5 mg/kg ($n = 3$ mares/dose) at 1300. No mare had a pulse of ST during the 1 h before treatment. All six mares given STS responded with ST pulses. The ST responses to STS at 1 and 5 mg/kg did not differ ($P > .05$); time to ST peak was 35 ± 4 min, pulse amplitude was 24.0 ± 6.3 ng/mL, and pulse duration was 100 ± 9 min. We conclude that mares and geldings fed grain once or twice daily usually have a period of 2 to 5 h after feeding with no ST pulses. When horses are fed grain at 0800, one may give a ST secretagogue at 1300 to avoid a refractory period and improve the probability of an ST response.

Descriptors: horses, age groups, hormone secretion, somatotropin, somatoliberin, circadian rhythm, hormonal control, feeding, blood plasma.

Notes: Meeting Information: Paper presented at "Swine Nutrition: Nutrient Usage During Pregnancy and Early Postnatal Growth, a Symposium in Honor of Wilson G. Pond" at the ASAS 88th Annual Meeting, July 25, 1996, Rapid City, S.D.

Crandell, K. (2005). **Trends in feeding the American endurance horse.** In: *Advances in Equine Nutrition III*, p. 181-184.

Descriptors: animal nutrition, Arab, calories, concentrates, dietary fat, feed grains, feed supplements, forage, horse feeding, protein, racehorses, reviews, horses.

Cuddeford, D. (2005). **Feeding, management and equine dentistry.** *The Veterinary Record* 156(23): 751. ISSN: 0042-4900.

Descriptors: abrasive wear, dentistry, diets, feeds, hay, haylage, horse feeding, racehorses, teeth, tooth diseases, grasses, horses, Poaceae.

De Fombelle, A., L. Veiga, C. Drogoul, and V. Julliand (2004). **Effect of diet composition and feeding pattern on the prececal digestibility of starches from diverse botanical origins measured with the mobile nylon bag technique in horses.** *Journal of Animal Science* 82(12): 3625-3634. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: feeding, starch digestion, prececal digestion, feed composition.

Drogoul, C., A. de Fombelle, and V. Julliand (2001). **Feeding and microbial disorders in horses. 2. Effect of three hay:grain ratios on digesta passage rate and digestibility in ponies.** *Journal of Equine Veterinary Science* 21(10): 487-491. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, fiber, digestibility, digesta passage rate, transit time, hay:grain ratios, barley, feeding disorders.

Fleurance, G., P. Duncan, H. Fritz, J. Cabaret, and I.J. Gordon (2005). **Importance of nutritional and anti-parasite strategies in the foraging decisions of horses: an experimental test.** *Oikos* 110(3): 602-612. ISSN: 0030-1299.

Online: <http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=oik>

Descriptors: contaminants, feces, feed intake, feeding behavior, feeding preferences, foraging, grass sward, nutritive value, parasites, parasitism, *Dactylis glomerata*, *Festuca arundinacea*, horses, *Lolium perenne*, *Strongylidae*, *Trifolium repens*.

Householder, D.D. (1996). **Feeding management of horses.** Texas Agricultural Extension Service. Creative Educational Video, Inc.: College Station, Texas, USA. Videocassette (55 min); 2 support publications.

NAL Call Number: Videocassette no. 2731

Abstract: Texas Agricultural Extension Service horse specialist Dr. Doug Householder hosts a program that tries to provide an understanding of horse nutrition, the composition of feeds, and horse behavior. Covers classes of horses and basic feeding programs, determining body weights and condition scoring, storing hays and concentrates, feeding hays, feeding concentrates, and managing eating behaviors. Support publications: The digestive system of the horse / D. Douglas Householder, Gary D. Potter, and Pete G. Gibbs (4 p.) ; Feeding management points for Texas horse owners by D. Douglas Householder et al. (7 p.).

Descriptors: nutrition, feed composition, horse behavior, body weight determination, body condition scoring, hays, grain, eating behaviors, equine digestive system.

Notes: "Funding for scripting provided by the Animal Nutrition Division of Cargill, Incorporated, Minneapolis, Minnesota." "Tape #TAM37005".

Hudson, J.M., N.D. Cohen, P.G. Gibbs, and J.A. Thompson (2001). **Feeding practices associated with colic in horses.** *Journal of the American Veterinary Medical Association* 219(10): 1419-1425. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Abstract: OBJECTIVE: To determine whether specific feeding practices were associated with development of colic in horses. DESIGN: Prospective matched case-control study. ANIMALS: 364 horses examined by veterinarians in private practice in Texas because of colic (cases; n = 182) or any other reason (controls; 182). PROCEDURE: Participating veterinarians were sent forms at the beginning of the study to collect information on signalment, feeding management practices, farm management practices, and preventive medical treatments. Case and control horses were compared by use of conditional logistic regression to identify factors associated with colic. RESULTS: Risk factors for colic were a recent change in batch of hay, decreased exposure to pasture, a recent change in type of grain or concentrate fed, feeding > 2.7 kg (6 lb) of oats/d, feeding hay from

round bales, and Thoroughbred breed. Recent anthelmintic administration decreased the risk of colic.

CONCLUSIONS AND CLINICAL RELEVANCE: Results suggest that certain changes in diet (eg, change in batch of hay, change in type of grain or concentrate, feeding hay from round bales) and management (eg, decreased availability of pasture) increase the risk of colic in horses.

Descriptors: colic, feeding methods, identified colic risk factors, change in batch of hay, decreased exposure to pasture, change in grain, use of round bales, Thoroughbreds, dietary changes and management.

Jackson, S.G. (1998). *The Effect of Type of Feed and Feeding Time on Glucose and Insulin Status of Horses*, Dodson and Horrell Ltd.: Kettering (United Kingdom), 4 p.

Descriptors: feeds, diet, horses, animal feeding, glucose, insulin, blood composition, blood, grazing, physical activity, aldoses, animal feeding, blood, carbohydrates, hormones, monosaccharides, peptides, reducing sugars, sugars, blood chemistry, exercise.

Notes: Meeting Information: International Conference on Feeding Horses: famous, independent experts talking on a range of topical and controversial subjects. Scientific session.

Jaggy, U. (1996). *Einfluss des Stallklimas, insbesondere von Heustaub, auf die Lungengesundheit von Pferden : Eine Feldstudie. [The influence of stable conditions, especially of hay-dust, on the state of health of horses lungs]*. Dissertation, Tierärztliche Hochschule: Hannover, Germany. 126 p.

NAL Call Number: DISS F1996171

Descriptors: horses, animal welfare, respiratory system, hay dust, environmental factors.

Language of Text: German with an English summary.

Notes: Thesis (doctoral)--Tierärztliche Hochschule Hannover, 1996.

Jansson, A. and K. Dahlborn (1999). **Effects of feeding frequency and voluntary salt intake on fluid and electrolyte regulation in athletic horses.** *Journal of Applied Physiology* 86(5): 1610-1616. ISSN: 8750-7587.

NAL Call Number: 447.8 J825

Descriptors: horses, fitness, meal frequency, fluid regulation, plasma aldosterone concentration, voluntary sodium intake.

Jose Cunilleras, E., K.W. Hinchcliff, R.A. Sams, S.T. Devor, and J.K. Linderman (2002). **Glycemic index of a meal fed before exercise alters substrate use and glucose flux in exercising horses.** *Journal of Applied Physiology* 92(1): 117-128. ISSN: 8750-7587.

NAL Call Number: 447.8 J825

Abstract: In a randomized, balanced, crossover study each of six fit, adult horses ran on a treadmill at 50% of maximal rate of oxygen consumption for 60 min after being denied access to food for 18 h and then 1) fed corn (51.4 kJ/kg digestible energy), or 2) fed an isocaloric amount of alfalfa 2-3 h before exercise, or 3) not fed before exercise. Feeding corn, compared with fasting, resulted in higher plasma glucose and serum insulin and lower serum nonesterified fatty acid concentrations before exercise ($P < 0.05$) and in lower plasma glucose, serum glycerol, and serum nonesterified fatty acid concentrations and higher skeletal muscle utilization of blood-borne glucose during exercise ($P < 0.05$). Feeding corn, compared with feeding alfalfa, resulted in higher carbohydrate oxidation and lower lipid oxidation during exercise ($P < 0.05$). Feeding a soluble carbohydrate-rich meal (corn) to horses before exercise results in increased muscle utilization of blood-borne glucose and carbohydrate oxidation and in decreased lipid oxidation compared with a meal of insoluble carbohydrate (alfalfa) or not feeding. Carbohydrate feedings did not produce a sparing of muscle glycogen compared with fasting.

Descriptors: treadmill exercise test, food restriction, corn, alfalfa, plasma glucose and serum insulin levels, carbohydrate oxidation, lipid oxidation during exercise, carbohydrate-rich meals prior to exercise.

Lacombe, V.A., K.W. Hinchcliff, C.W. Kohn, S.T. Devor, and L.E. Taylor (2004). **Effects of feeding meals with various soluble-carbohydrate content on muscle glycogen synthesis after exercise in horses.** *American Journal of Veterinary Research* 65(7): 916-923. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, exercise, feeding, nutrition, soluble-carbohydrate content, muscle glycogen synthesis.

- Laudadio, V., A.M. Cito, and F. Petrerà (2005). **Indagine sulla gestione alimentare del cavallo da salto ad ostacoli. [Investigation on feeding management in jumping horse].** *Obiettivi e Documenti Veterinari* 26(4): 31-34. ISSN: 0392-1913.
Descriptors: animal nutrition, energy intake, feed intake, feeding, nutrient requirements, protein intake, working animals, horses.
Language of Text: Italian with an English summary.
- Lorenzo Figueras, M., T. Preston, E. Ott, and A.M. Merritt (2005). **Meal-induced gastric relaxation and emptying in horses after ingestion of high-fat versus high-carbohydrate diets.** *American Journal of Veterinary Research* 66(5): 897-906. ISSN: 0002-9645.
NAL Call Number: 41.8 Am3A
Descriptors: horses, feeding, nutrition, meal content, gastric relaxation, gastric emptying.
- McKeever, K.H. (2005). **Can feed cause a positive blood test in racehorses? Some recent information on the effect of dietary supplements on plasma tCO₂ concentration in horses.** In: *Advances in Equine Nutrition III*, p. 69-76.
Descriptors: bicarbonates, blood chemistry, carbon dioxide, electrolytes, feed supplements, pH, racehorses, reviews, horses.
- Micol, D., W. Martin Rosset, and C. Trillaud Geyl (1996). **Systemes d'elevage et d'alimentation a base de fourrages pour les chevaux. [Horse rearing and feeding systems with high forage diet].** *Equ'Idee*(24): 71-85. ISSN: 1162-8103.
Descriptors: saddle horses, rearing techniques, feeding systems, grazing, concentrates, rations, high forage diets.
Language of Text: French.
- Moore Colyer, M.J.S. (1996). **Effect of soaking hay fodder for horses on dust and mineral content.** *British Society of Animal Science* 63(2): 337-342. ISSN: 1357-7298.
NAL Call Number: SF1.A56
Descriptors: soaking hay, allergens, dust in hay, mineral content, particle size, soaking, antigens, immunological factors, pollutants.
- Murrell, K.D., M. Djordjevic, K. Cuperlovic, L. Sofronic, M. Savic, M. Djordjevic, and S. Damjanovic (2004). **Epidemiology of *Trichinella* infection in the horse: the risk from animal product feeding practices.** *Veterinary Parasitology* ISSN: 0304-4017.
NAL Call Number: SF810.V4
Descriptors: horses, *Trichinella spiralis*, trichinosis, epidemiology, risk factors, animal feeding, meat products, food wastes, feed contamination, feeding behavior, infection, Serbia, equine trichinellosis, infected meat, meat eating behavior.
- Ninomiya, S., R. Kusunose, S. Sato, M. Terada, and K. Sugawara (2004). **Effects of feeding methods on eating frustration in stabled horses.** *Animal Science Journal* 75(5): 465-469. ISSN: 1344-3941.
NAL Call Number: SF1.A542
Descriptors: horses, stable environment, feeding methods, behavioral evaluation, hay length, feeding time, feeding frequency, feeding location, hay type.
- Pagan, J.D. (2005). **Feeding management of horses under stressful conditions.** In: J.D. Pagan (Editor), *Advances in Equine Nutrition III*, Nottingham University Press: Nottingham, UK, p. 107-120. ISBN: 1904761283.
NAL Call Number: SF285.5.A39 2005
Descriptors: horses, stress, performance, competition, feeding methods, gastrointestinal function, hydration status, electrolytes, nutrition, effect of feeding practices on performance, electrolytes.
- Pagan, J.D. and P.A. Harris (1999). **The effects of timing and amount of forage and grain on exercise response in Thoroughbred horses.** *Equine Veterinary Journal* 30(Suppl.): 451-457. ISSN: 0425-1644.
NAL Call Number: SF955.E6

Abstract: There is considerable debate among horsemen about how to feed horses before exercise. Should horses be fed or fasted before work and when should hay be fed relative to grain and/or exercise? Three experiments were conducted to evaluate if feeding hay with and without grain affects glycaemic and haematological responses in Thoroughbred (TB) horses at rest and during a simulated competition exercise test (CET) on a high-speed treadmill. In Experiment 1, 6 TB horses were fed hay at 3 different times relative to a grain meal. Time of feeding hay affected glycaemic response, plasma protein and water intake post grain feeding. During Experiment 2, 4 TB horses were used in a 4 x 4 Latin square design to determine whether feeding grain with or without hay prior to a CET would affect substrate utilisation and exercise. Feeding grain reduced free fatty acid (FFA) availability and increased blood glucose disappearance during exercise ($P < 0.05$). Feeding hay either along with grain or ad libitum the night before exercise resulted in reduced plasma volume ($P < 0.05$) and higher lactate production ($P < 0.05$) and heart rates ($P < 0.05$) during exercise. During Experiment 3, 4 TB horses were used in a 4 x 4 Latin square design experiment to determine whether feeding forage but no grain prior to CET would affect substrate utilisation and performance. Feeding only forage before exercise did not adversely affect performance. It was concluded that grain should be withheld from horses before exercise, but that small quantities of hay should be fed to ensure proper gastrointestinal tract function.

Descriptors: Thoroughbreds, feeding horses prior to exercise, glycaemic and hematological responses, treadmill exercise, feeding only forage prior to exercise, withholding of grain prior to exercise.

Pearson, R.A., R.F. Archibald, and R.H. Muirhead (2006). **A comparison of the effect of forage type and level of feeding on the digestibility and gastrointestinal mean retention time of dry forages given to cattle, sheep, ponies and donkeys.** *British Journal of Nutrition* 95(1): 88-98. ISSN: 0007-1145.
NAL Call Number: 389.8 B773
Descriptors: barley, barley straw, diets, digestibility, digestion, feed intake, forage, hay, lucerne, rumen digestion, straw, cattle, donkeys, horses, *Medicago*, sheep.

Pluta, M. (2000). **Ocena zywienia konikow polskich, arabokonikow i kucow felinskih w systemie ad libitum oraz znormalizowanej pracy.** [Estimation of the feeding of Polish Konik horses, Arab Konik horses and Felin Ponies in a system of ad libitum maintenance and standardized work]. *Annales Universitatis Mariae Curie Sklodowska Sectio EE Zootechnica (Poland)* 18: 145-153. ISSN: 0239-4243.
NAL Call Number: SF84.A56

Abstract: The aim of the study was to find out information on the range of hay and oat amounts taken by Polish Konik, Arab Konik and Felin Pony mares fed ad libitum and exercised in standardized work. The mares were subjected to three kinds of experiments: in an electric treadmill, under saddle and in harness. 14 mares took part in 10 experiments, which examined 30 factors. The intensity of work negatively influenced the water and hay intake and positively the oat intake. The latter effect was significant. In all experiments there was a tendency to exceed the nutrient requirements. Arab Konik mares were came out to be the most resistant to be quality of work, while those of Felin Pony type usually reacted with a considerable increase in feed, nutrient and water intake. Polish Konik mares placed themselves at the medium position between the other 2 groups of mares.

Descriptors: horse breeds comparison, Polish Konik, Arab Konik, Felin Pony, mares, exercise, treadmill, under saddle, in harness, effect of work intensity on intake of food and water, animal feeding, unrestricted feeding, nutrient requirements.

Language of Text: Polish with an English summary.

Riond, J.L., S. Leoni, and M. Wanner (2000). **Etude comparative de trois modes de rationnement pour les chevaux du train de l'armee suisse.** [Comparative study of three feeding methods for the draught horses of the Swiss army]. *Schweizer Archiv Fuer Tierheilkunde* 142(10): 570-579. ISSN: 0036-7281.
NAL Call Number: 41.8 SCH9
Descriptors: horses, feeding methods, nutrition, feed analysis, feed consumption, eating behavior, digestibility.
Language of Text: French.

Ullstein Jr., H. (1998). **Feeding technique for welfare of horses.** *Journal of Animal Physiology and Animal Nutrition* 80(2-5): 217-219. ISSN: 0931-2439.
Descriptors: horses, management practices, feeding, animal welfare.

Vogel, C. (1996). *The Complete Performance Horse: Preventive Medicine, Fitness, Feeding, Lameness*, David & Charles: Newton Abbot, Devon, UK, 240 p. ISBN: 0715303457.

NAL Call Number: SF956.V64 1996

Descriptors: equine sports medicine handbooks, manuals, competition horses diseases handbooks, manuals, competition horses wounds and injuries handbooks, manuals, competition horses health handbooks, manuals.

Waller, A., K.J. Smithurst, G.L. Ecker, R. Geor, and M.I. Lindinger (2005). **Cyclical plasma electrolyte and acid-base responses to meal feeding in horses over a 24-h period.** *Equine and Comparative Exercise Physiology* 2(3): 159-169. ISSN: 1478-0615.

Descriptors: blood plasma electrolyte state, acid base equilibrium, effect of feeding, plasma acidosis, carbon dioxide, hydrogen ion concentration, physicochemical variables.

Zeitler Feicht, M.H. and S. Walker (2005). **Zum Einsatz eines speziellen Heunetzes in der Pferdefütterung aus ethologischer Sicht. [Deployment of a special net as a method of hay feeding in horses under ethological aspects].** *Pferdeheilkunde* 21(3): 229-233. ISSN: 0177-7726.

Descriptors: feeding methods, hay consumption time, loose hay versus netted hay, feeding behavior.

Language of Text: German with an English summary.

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Feeding Restrictions

Christensen, R.A., K. Malinowski, A.M. Massenzio, H.D. Hafs, and C.G. Scanes (1997). **Acute effects of short-term feed deprivation and refeeding on circulating concentrations of metabolites, insulin-like growth factor I, insulin-like growth factor binding proteins, somatotropin, and thyroid hormones in adult geldings.**

Journal of Animal Science 75(5): 1351-1358. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Two studies were performed with Standardbred geldings 7 to 21 yr of age to determine the sequence of changes in blood plasma concentrations of some hormones and metabolites during feed deprivation for 48 h and for 12 h after refeeding. Plasma hormone and metabolite concentrations were determined with methods validated for horse plasma. Insulin-like growth factor binding proteins (IGFBP) were determined with radioligand analysis following SDS-PAGE electrophoresis. In both experiments, plasma concentrations of triiodothyronine and thyroxine decreased ($P < .01$) during feed deprivation and increased ($P < .01$) during refeeding. Plasma glucose and IGF-I either decreased or were not altered during feed deprivation. In contrast, plasma concentrations of NEFA and urea nitrogen increased ($P < .01$) during feed deprivation and decreased ($P < .01$) during the refeeding period. Plasma somatotropin (ST) increased ($P < .01$) approximately 80% at 24 to 36 h of feed deprivation, declined ($P < .01$) to control values at 48 h of feed deprivation, increased ($P < .01$) nearly three fold at 3 h after refeeding, and returned to control values by 6 h after refeeding. We identified five IGFBP, and their plasma concentrations were not significantly altered during feed deprivation or following refeeding. We conclude that metabolite availability during feed deprivation and following refeeding alters the secretion of thyroid hormones, ST, and possibly IGF-I, thereby maintaining homeostasis in horses.

Descriptors: horses, American Trotter, food deprivation, refeeding, blood plasma, insulin like growth factor, binding proteins, triiodothyronine, thyroxine, blood sugar, fatty acids, urea, somatotropin, homeostasis.

Notes: Meeting Information: Paper presented at "Stressors That Alter Animal Growth" at the Midwest ASAS/ADSA meetings March 18-20, 1996, Des Moines, IA.

Frank, N., J.E. Sojka, and M.A. Latour (2003). **Effect of hypothyroidism and withholding of feed on plasma lipid concentrations, concentration and composition of very-low-density lipoprotein, and plasma lipase activity in horses.** *American Journal of Veterinary Research* 64(7): 823-828. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, metabolism, hypothyroidism, feeding practices, plasma lipid concentration, lipoprotein, plasma lipase activity.

Frank, N., J.E. Sojka, and M.A. Latour (2002). **Effect of withholding feed on concentration and composition of plasma very low density lipoprotein and serum nonesterified fatty acids in horses.** *American Journal of Veterinary Research* 63(7): 1018-1021. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: mares, food deprivation, blood lipids, very low density lipoprotein, blood plasma, fatty acids, blood serum, variation, unrestricted feeding, triacylglycerols, blood sugar.

McManus, C.J. (2001). *Effect of food restriction and pharmacological repartitioning of energy intake on*

reproductive activity in the mare. Dissertation, University of Kentucky: Lexington, Kentucky, USA.

Descriptors: horses reproduction, sexual behavior of animals, mares feeding and feeds, fertility effect of drugs on, mares fertility, fertility nutrition.

Notes: Thesis (Ph. D.)--University of Kentucky, 2001.

McManus, C.J. and B.P. Fitzgerald (2000). **Effects of a single day of feed restriction on changes in serum leptin, gonadotropins, prolactin, and metabolites in aged and young mares.** *Domestic Animal Endocrinology* 19(1): 1-13. ISSN: 0739-7240.

NAL Call Number: QL868.D6

Abstract: In a variety of species, short-term feed restriction leads to restriction leads to rapid changes in the reproductive axis and reduces serum levels of leptin. Two experiments were performed to test the hypothesis that a single day of feed restriction in aged and young mares would cause a suppression of the gonadotropins and serum leptin concentrations. The estrous cycles of 12 aged (>eight years; Exp. 1) and eight young (<five years; Exp. 2) mares were synchronized and the mares were conditioned to twice-daily meal feeding. On the seventh day after synchronization, restricted mares (n=6 for Exp. 1; n=4 for Exp. 2) were not fed for 24 hr; all mares were fed the second day. In Exp. 1, serum leptin concentrations significantly decreased in restricted mares, but not in controls. In Exp. 2, serum leptin concentrations declined in restricted mares and no decline was seen in the controls. Serum glucose concentrations did not change in response to feed restriction or refeeding, but in both experiments feed restriction caused an increased in free fatty acids. For both experiments, prolactin, FSH, and LH serum concentrations were not significantly altered by feed restriction. The observed of suppression may reflect the maintenance of sufficient levels of metabolizable fuels, rather than a failure of leptin to signal nutritional status to the reproductive axis of the mare.

Descriptors: mares, restricted feeding, refeeding, hormones, FSH, LH, prolactin, hormone secretion, blood serum, blood sugar, blood lipids, blood plasma, fatty acids, estrous cycle, synchronized females, age.

Messer, N.T., P.J. Johnson, K.R. Refsal, R.F. Nachreiner, V.K. Ganjam, and G.F. Krause (1995). **Effect of food deprivation on baseline iodothyronine and cortisol concentrations in healthy, adult horses.** *American Journal of Veterinary Research* 56(1): 116-121. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Abstract: Six healthy, adult horses, with normal (mean +/- SEM) baseline serum concentrations of total triiodothyronine (T3, 1.02 +/- 0.16 nmol/L), free T3 (FT3, 2.05 +/- 0.33 pmol/L), total thyroxine (T4, 19.87 +/- 1.74 nmol/L), free T4 (FT4, 11.55 +/- 0.70 pmol/L), total reverse T3 (rT3, 0.68 +/- 0.06 nmol/L), and cortisol (152.75 +/- 17.50 nmol/L), were judged to be euthyroid on the basis of response to a standardized thyroid-stimulating hormone response test. Serum concentrations of T3, FT3, T4, FT4, rT3, and cortisol were determined immediately before and every 24 hours during a 4-day period of food deprivation, when water was available ad libitum. Similar variables were measured 72 hours after refeeding. Decreases (to percentage of baseline, prefood deprivation value) in circulating T3 (42%), T4 (38%), FT3 (30%), and FT4 (24%) concentrations were maximal after 2, 4, 2, and 4 days of food deprivation, respectively (P < 0.05). Increases (compared with baseline, prefood deprivation value) in rT3 (31%) and cortisol (41%) concentrations were maximal after 1 and 2 days of food deprivation, respectively (P < 0.05). Refeeding resulted in increase in serum T4 and FT4, and decrease in rT3 and cortisol concentrations toward baseline values, after 72 hours (P < 0.05). Refeeding did not effect a return of T3 or FT3 concentration to baseline values after 72 hours (P < 0.05). Food deprivation appears to cause changes in serum concentrations of T3, FT3, T4, FT4, rT3, and cortisol in horses that are similar to those in human beings. This effect of food deprivation should be considered when results of serum thyroid hormone and cortisol assays are interpreted in the face of clinical. disease. These results further emphasize the invalidity of making a clinical diagnosis of hypothyroidism on the basis of baseline, serum thyroid hormone concentrations in horses, especially if the horses have been anorectic or inappetent.

Descriptors: horses, food deprivation, triiodothyronine, hydrocortisone, thyroxine, blood serum, total-thyroxine, free-thyroxine, total-triiodothyronine, free-triiodothyronine, reverse-triiodothyronine.

Meyer, H. (1996). **Influence of feed intake and composition, feed and water restriction, and exercise on gastrointestinal fill in horses. 2.** *Equine Practice* 18(9): 20-23. ISSN: 0162-8941.

NAL Call Number: SF951.E62

Descriptors: feed intake, water uptake, hay, feeds, physical activity, digestive system, dry matter content,

moisture content, feed and water restriction, effects of exercise.

Murray, M.J. and E.S. Eichorn (1996). **Effects of intermittent feed deprivation, intermittent feed deprivation with ranitidine administration, and stall confinement with ad libitum access to hay on gastric ulceration in horses.** *American Journal of Veterinary Research* 57(11): 1599-1603. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, stomach ulcers, food deprivation, restricted feeding, gastrointestinal agents, stomach mucosa, lesions, acidity, unrestricted feeding, feeding behavior, grazing, hay.

Murray, M.J. and T.C. Grady (2002). **The effect of a pectin-lecithin complex on prevention of gastric mucosal lesions induced by feed deprivation in ponies.** *Equine Veterinary Journal* 34(2): 195-198. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, food deprivation, lesions, stomach mucosa, pectins, phosphatidylcholines, disease prevention, stomach ulcers, pronutrin.

Nadal, M.R., D.L. Thompson Jr., and L.A. Kincaid (1997). **Effect of feeding and feed deprivation on plasma concentrations of prolactin, insulin, growth hormone, and metabolites in horses.** *Journal of Animal Science* 75(3): 736-744. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Two experiments were conducted to determine 1) the prolactin response to different kinds of feedstuffs in stallions and 2) the effects of total feed deprivation on prolactin secretion in mares and its interaction with the prolactin response to feeding. Experiment 1 was performed with stallions as a 6 X 6 Latin square: A) no feed; B) pelleted feed fed to meet 82.5% of the horses' CP requirements; C) pelleted feed at 25% of the amount in B; D) pelleted feed as in B plus water ad libitum; E) cracked corn at the weight in B; and F) chopped alfalfa at the weight in B. The positive prolactin responses ($P < .05$) to feeding were similar for treatments B through F. The insulin response to feeding was highest ($P < .05$) in stallions fed water with the pelleted feed. In Exp. 2, 72 h of feed deprivation did not affect ($P > .1$) daily prolactin secretion. Feeding of a meal on the 3rd d of deprivation increased ($P < .05$) plasma prolactin, insulin, and glucose concentrations similarly in all mares. There was a positive growth hormone response ($P < .1$) after feeding in feed-deprived mares but not in fed mares. The prolactin response ($P < .001$) to thyrotropin-releasing hormone was greater ($P = .083$) for feed-deprived mares than for controls, whereas the response to sulpiride ($P < .001$) only tended to differ ($P = .16$) between groups. We conclude that prolactin secretion may be stimulated by aspects of eating other than the feedstuff itself. Total feed deprivation had little effect on the subsequent prolactin response to a meal or to other known secretagogues.

Descriptors: stallions, starvation, pelleted feeds, drinking water, mares, blood plasma, prolactin, insulin, blood sugar, fatty acids, maize, alfalfa, thyrotropin releasing hormone.

Powell, D.M. (1999). **Effect of short- and long-term calorie restriction and diet composition on thyroid hormone and the metabolic responses to meal feeding and exercise in horses.** Dissertation, University of Kentucky: 135 p.

Descriptors: horses feeding and feeds, horses exercise, Thoroughbreds.

Notes: Thesis (Ph. D.)--University of Kentucky, 1999.

Powell, D., L.M. Lawrence, T. Brewster Barnes, B. Fitzgerald, L.K. Warren, S. Rokuroda, A. Parker, and A. Crum (1999). **The effect of diet composition and feeding state on the response to exercise in feed-restricted horses.** *Equine Veterinary Journal* 30(Suppl.): 514-518. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Abstract: Eight Thoroughbred horses were used to determine the effects of long-term calorie restriction and diet composition on serum T4 and T3 concentrations and metabolic responses with exercise. Horses were randomly assigned to 2 treatment groups ($n = 4$): Group 1, horses were fed a calorie-restricted diet designed to have 70% of the calories from the roughage source (RHR); Group 2, horses were fed a calorie-restricted diet designed to have 70% of the calories from the concentrate source (RHC). Horses then completed 2 step-wise exercise tests; one following a 12 h fast and one 2 h after a meal of 2 kg of a grain mix. Glucose concentrations declined ($P < 0.01$) in fed horses on the RHR diet but did not change in fed horses on the RHC diet. Fasted horses receiving the RHR diet had a more rapid increase in glucose concentration during exercise compared to fasted horses

receiving the RHC diet ($P < 0.01$) as well as the highest glucose concentration at fatigue ($P < 0.05$). Insulin concentrations were higher ($P < 0.05$) at fatigue in fed horses on the RHR diet. Fasted horses receiving the RHR diet had higher ($P < 0.01$) pre-exercise FFA concentrations and a more rapid decline ($P < 0.01$) in FFA during exercise. Serum T3 concentrations increased ($P < 0.01$) in response to exercise within all treatments. The differences in thyroid hormone, glucose and FFA responses to exercise suggest that calorie source may be important in the hormonal regulation and energy metabolism of horses consuming calorie deficient diets.

Descriptors: food deprivation, thyroid hormones, fatty acids, heart rate, insulin, muscle fatigue, Thoroughbreds, effects of long-term calorie restriction, composition of diet, serum T4 and T3 concentrations, effects of exercise.

Powell, D.M., L.M. Lawrence, B.P. Fitzgerald, K. Danielsen, A. Parker, P. Siciliano, and A. Crum (2000). **Effect of short-term feed restriction and calorie source on hormonal and metabolic responses in geldings receiving a small meal.** *Journal of Animal Science* 78(12): 3107-3113. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: The metabolic effects of short-term feed restriction and dietary calorie source were studied in horses receiving high-roughage or high-concentrate diets. Four Thoroughbred geldings were assigned to four treatment groups in a 4 x 4 Latin square experiment. The four treatments were 1) a nutritionally adequate high-roughage ration (70% roughage, 30% concentrate; AHR), 2) a nutritionally adequate high-concentrate ration (40% roughage, 60% concentrate; AHC), 3) 70% of the intake of the AHR diet (RHR), and 4) 70% of the intake of the AHC diet (RHC). Diets AHR and AHC were designed to meet the caloric need of horses undergoing moderately intense work. Blood samples were taken on the first 7 d of each period for analysis of serum T4 and T3 concentrations. On d 9 of each feeding period, each horse was fed 1.0 kg of oats as the morning meal. Jugular blood was sampled before and immediately after, as well as at 30 min after, completion of the meal and subsequently every hour for 7 h. Daily serum T4 and T3 concentrations were not affected by day, feeding level, or diet composition. Meal feeding produced an increase ($P < 0.01$) in T4 and T3 concentrations when horses were adapted to the AHR and AHC diets but not the RHR or RHC diets. Thyroxine concentrations were lowest ($P < 0.05$) when horses were adapted to the AHC diet. Glucose ($P < 0.05$), insulin ($P < 0.01$), and NEFA ($P < 0.01$) concentrations were higher in response to the meal when horses received RHR than for the other diets. These results indicate that nutrient restriction alters responses to meal feeding in horses and that this response may also be affected by the dietary roughage:concentrate ratio.

Descriptors: horses, restricted feeding, diets, roughage, hay, oats, blood serum, l thyroxine, triiodothyronine, blood sugar, blood lipids, fatty acids, insulin, digestive absorption, body weight.

Spader, B.R., P.R. Buff, and D.H. Keisler (2002). **Fasting and re-feeding responses of plasma leptin in pony mares.** *Journal of Animal Science* 80(Suppl. 2): 35. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, feed management, effects of feed deprivation, endocrinology.

Notes: Meeting Information: Meeting of the American Society of Animal Science, Southern Section, Orlando, Florida, USA; February 01-06, 2002.

Sticker, L.S., D.L. Thompson Jr., L.D. Bunting, J.M. Fernandez, and C.L. DePew (1995). **Dietary protein and (or) energy restriction in mares: plasma glucose, insulin, nonesterified fatty acid, and urea nitrogen responses to feeding, glucose, and epinephrine.** *Journal of Animal Science* 73(1): 136-144. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Sixteen light horse mares (8 to 9 yr of age; 457 to 579 kg BW) were fed Bermudagrass hay and a corn/cottonseed hull-based supplement formulated to contain either 100% (control) or 50% (restricted) of the protein and(or) energy requirements for maintenance in a 2 X 2 factorial arrangement of treatments. Daily measurements of intake, BW, and plasma hormones and metabolites were made for 33 d. Plasma glucose, insulin, NEFA, and urea N were measured in hourly samples drawn on d 27, and parallel with an i.v. glucose tolerance test (IVGTT) and epinephrine challenge on d 29. Energy restriction increased daily NEFA concentrations ($P < .001$) and urea N ($P = .013$), whereas protein restriction decreased ($P = .002$) urea N concentrations. These effects of protein and energy restriction occurred within 24 h and were consistent (day effect, $P > .1$) throughout the remaining 24 d. Normal meal consumption elevated plasma glucose, insulin, and urea N concentrations (time effect, $P < .08$). Plasma NEFA concentrations did not change after feeding in mares fed control energy, but decreased in mares fed restricted energy (energy X time interaction, $P = .005$). After

IVGTT, areas under the curve for plasma glucose and insulin were smaller in mares fed restricted protein ($P < .05$), whereas glucose area was larger in mares fed restricted energy ($P = .009$). After epinephrine injection, energy restriction increased the initial magnitude of the NEFA response, but after 50 min, reduced plasma NEFA below pre-injection concentrations (energy X time interaction, $P = .06$). We conclude that metabolic responses occur within 24 h of dietary changes and that plasma constituents are altered by protein and(or) energy restriction. during feeding, glucose, and epinephrine challenges.

Descriptors: mares, restricted feeding, energy intake, protein intake, body weight, blood sugar, blood plasma, insulin, fatty acids, urea, glucose tolerance, epinephrine.

Sticker, L.S., D.L. Thompson Jr., L.D. Bunting, J.M. Fernandez, C.L. DePew, and M.R. Nadal (1995). **Feed deprivation of mares: plasma metabolite and hormonal concentrations and responses to exercise.** *Journal of Animal Science* 73(12): 3696-3704. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Twelve light horse mares were fed a control diet that provided 100% of their maintenance protein and energy requirements for 7 d and were then either continued on the control diet or totally deprived of feed (with access to water) for 3 d. Plasma samples were drawn twice daily throughout the experiment, at 15-min intervals for 9 h beginning 45 h after feed removal, and at 10-min intervals around an exercise bout beginning 73 h after feed removal. Feed deprivation increased ($P < .06$) whole blood beta-hydroxybutyrate and plasma NEFA, urea N, L-lactate, and glucagon concentrations, decreased ($P = .02$) IGF-I concentrations, and did not change ($P > .1$) plasma glucose, insulin, prolactin, triiodothyronine, and thyroxine concentrations. Exercise increased ($P < .05$) plasma NEFA, prolactin, and growth hormone (GH) concentrations in all mares. Plasma NEFA concentrations increased ($P < .001$) after exercise and remained increased in fed mares, but rapidly decreased in deprived mares (time X diet interaction, $P = .006$). Plasma glucose concentrations following exercise increased in deprived mares but decreased in fed mares (time X diet interaction, $P = .07$). The plasma prolactin response after exercise also differed between groups ($P = .09$). Feed-deprived mares had greater ($P = .02$) plasma GH concentrations before exercise (73 h after feed withdrawal) and had a greater ($P < .001$) GH peak at 10 min after initiation of exercise. The increase in secretion rate of GH due to feed deprivation in these mares was similar to that reported for other domestic species but was not nearly as great in magnitude.

Descriptors: mares, starvation, duration, blood plasma, exercise, fatty acids, urea, lactic acid, glucagon, insulin like growth factor, blood sugar, prolactin, hydrocortisone, somatotropin, thyroid hormones.

Suwannachot, P., C.B. Verkleij, S. Kocsis, E. Enzerink, and M.E. Everts (2000). **Prolonged food restriction and mild exercise in Shetland ponies: effects on weight gain, thyroid hormone concentrations and muscle Na⁺K⁺-ATPase.** *Journal of Endocrinology* 167(2): 321-329. ISSN: 0022-0795.

NAL Call Number: 448.8 J8293

Descriptors: horses, skeletal muscle, effects of food supply, effects of training, blood chemistry, endocrine system, growth.

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Age Specific Nutrition

Buechner Maxwell, V.A. (2005). **Nutritional support for neonatal foals.** *Veterinary Clinics of North America, The Equine Practice* 21(2): 487-510. ISSN: 0749-0739.

Descriptors: complications, diets, foals, horse feeding, newborn animals, nutrients, nutritional support, parenteral feeding, therapy, horses.

Cartmill, J.A., D.L. Thompson, W.A. Storer, J.C. Crowley, N.K. Huff, and C.A. Waller (2005). **Effect of dexamethasone, feeding time, and insulin infusion on leptin concentrations in stallions.** *Journal of Animal Science* 83(8): 1875-1881. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Three experiments tested the hypotheses that daily cortisol rhythm, feeding time, and/or insulin infusion affect(s) leptin secretion in stallions. Ten mature stallions received ad libitum hay and water and were fed a grain concentrate once daily at 0700. In Exp. 1, stallions received either a single injection of dexamethasone (125 [micro]g/kg BW i.m.; n = 5) or vehicle (controls; n = 5) at 0700 on d -1. Starting 24 h later, blood samples were collected every 2 h for 36 h via jugular venipuncture. Cortisol in control stallions varied ($P < 0.01$) with time, with a morning peak and evening nadir; dexamethasone suppressed ($P < 0.01$) cortisol concentrations. Leptin and insulin were greater ($P < 0.01$) in the treated stallions, as was the insulin response to feeding ($P < 0.01$). Leptin in control stallions varied ($P < 0.01$) in a diurnal pattern, peaking approximately 10 h after onset of eating. This pattern of leptin secretion was similar, although of greater magnitude ($P < 0.01$), in treated stallions. In Exp. 2, five stallions were fed the concentrate portion of their diet daily at 0700 and five were switched to feeding at 1900. After 14 d on these regimens, blood samples were collected every 4 h for 48 h and then twice daily for 5 d. Cortisol varied diurnally ($P = 0.02$) and was not altered ($P = 0.21$) by feeding time. Insulin and leptin increased ($P < 0.01$) after feeding, and the peaks in insulin and leptin were shifted 12 h by feeding at 1900. In Exp. 3, six stallions were used in two 3 x 3 Latin square experiments. Treatments were 1) normal daily meal at 0700; 2) no feed for 24 h; and 3) no feed and a bolus injection of insulin (0.4 mIU/kg BW i.v.) followed by infusion of insulin (1.2 mIU[bullet]kg BW-1[bullet]min-1) for 180 min, which was gradually decreased to 0 by 240 min; sufficient glucose was infused to maintain euglycemia. Plasma insulin increased ($P < 0.01$) in stallions when they were meal-fed (to approximately 150 [micro]IU/mL) or infused with insulin and glucose (to approximately 75 [micro]IU/mL), but insulin remained low (10 [micro]IU/mL or less) when they were not fed. The increases in insulin were paralleled by gradual increases ($P < 0.01$) in leptin concentrations 3 to 4 h later in stallions fed or infused with insulin and glucose. When stallions were not fed, leptin concentrations remained low. These results demonstrate that feeding time, and more specifically the insulin increase associated with a meal, not cortisol rhythm, drives the postprandial increase in plasma leptin concentrations in horses.

Descriptors: horses, plasma leptin concentration, insulin, daily cortisol rhythm, dexamethasone, feeding time, stallions.

Danek, J., E. Wisniewski, and W. Krumrych (1996). **Wplyw nadmiaru wapnia w paszy na jakosc nasienia ogierow. [Effect of calcium excess in feed on semen quality in stallions].** *Medycyna Weterynaryjna* 52(7): 459-461. ISSN: 0025-8628.

NAL Call Number: 41.8 M463

Descriptors: stallions, semen quality, calcium supplements, spermatozoa, animal feeding.

Language of Text: Polish.

De Oliveira, K., C.E. Furtado, and E.P. Da Graca (2001). **Desempenho e parametros sanguineos de equinos em crescimento submetidos a dietas com diferentes niveis de farelo de canola.** [Performance and blood parameters of growing equine fed diets with different levels of canola meal]. *Revista Brasileira De Zootecnia* 30(1): 174-180. ISSN: 1516-3598.

Descriptors: growing horses, nutrition, canola meal, soybean meal, performance, blood parameters, concentrates.

Language of Text: Portuguese.

De Rezende, A.S.C., I.B.M. Sampaio, G.L. Legorreta, and D.C.D.A. Moreira (2000). **Efeito de dois diferentes programas nutricionais sobre o desenvolvimento corporal de potros Mangalarga marchador.** [Effect of two different nutritional programs on development in Mangalarga Marchador foals]. *Revista Brasileira De Zootecnia* 29(2): 495-501. ISSN: 1516-3598.

Descriptors: horses, foals, weaning, concentrate, supplements, Mangalarga Marchador, Brazilian horse breed.

Language of Text: Portuguese.

Dos Santos, C.P., C.E. Furtado, C.C. Jobim, A.C. Furlan, C.A. Mundim, and E.P. Da Graca (2002). **Avaliacao da silagem de graos umidos de milho na alimentacao de equinos em crescimento: valor nutricional e desempenho.** [Evaluation of high moisture corn silage for growing horses diets: Nutritional value and performance]. *Revista Brasileira De Zootecnia* 31(3): 1214-1222. ISSN: 1516-3598.

Descriptors: growing horses, nutrition, high moisture corn silage, growth, performance, corn grain alternatives.

Language of Text: Portuguese.

Drozdova, J. and L. Bindas (1997). **Zasady spravnej vyzivy zriebat.** [Principles of proper nutrition of foals]. In: *Proceedings from the International Conference Held on the Occasion of the 50th Anniversary of the Research Institute of Animal Production, October 8, 1997-October 9, 1997, Nitra, Slovak Republic, Nitra, Slovak Republic*, p. 163-165. ISBN: 8096770020.

Abstract: The work deals with the main principles of the proper nutrition of foals based both on earlier practical experiences and present knowledge. In relation to the prevention of health disorders it relates to the problems within the periods of the colostrum and milk nutrition to the questions of artificial raising of foals and the principles of proper weaning and post-weaning of foals.

Descriptors: foal nutrition, experience and scientific knowledge, health disorders, colostrum, milk nutrition, artificial rearing of foals, weaning.

Language of Text: Slovak.

Fowden, A.L., P.M. Taylor, K.L. White, and A.J. Forhead (2000). **Ontogenic and nutritionally induced changes in fetal metabolism in the horse.** *Journal of Physiology* 528(1): 209-219. ISSN: 0022-3751.

NAL Call Number: 447.8 J82

Descriptors: horses, Fick principle, tracer method, fetal foals, nutrition, gestational stages, umbilical bloodflow, umbilical oxygen uptake, fetal glucose use, umbilical lactate uptake.

Guay, K.A., H.A. Brady, V.G. Allen, K.R. Pond, D.B. Wester, L.A. Janecka, and N.L. Heninger (2002). **Matua bromegrass hay for mares in gestation and lactation.** *Journal of Animal Science* 80(11): 2960-2966. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Matua bromegrass hay (*Bromus willdenowii* Kunth) is a high quality forage, but its value for mares during gestation and lactation is not well known. Intake, rate of passage, performance, and reproduction by gestating and lactating Quarter Horse mares fed the hay was investigated. In this experiment, 12, 2- to 12-yr-old gravid mares (mean BW = 553 kg; SD = 36) were fed Matua hay (CP = 11.5%) or alfalfa hay (*Medicago sativa* L.) (CP = 15.4%) for variable days prepartum (mean 59.9 d; SD = 23.5) and for 70 d postpartum. Matua and alfalfa hay were fed as the roughage portion of the diet with a grain supplement. Mares, blocked by age,

expected date of foaling, and BW, were assigned randomly within blocks to treatments (six mares per treatment). Forage type did not affect intake, gestation length, birth weight, number of foals, foal weight gain, day of first postpartum ovulation, cycles per conception, or pregnancy rate at 70 d. On d 1, milk from mares fed alfalfa hay contained less ($P < 0.03$) CP than milk from mares fed Matua hay. Milk CP decreased ($P < 0.01$) in all mares over time. In a separate experiment, voluntary intake and rate of passage of Matua (CP = 15.5%), alfalfa (CP = 24.9%), and Timothy (*Phleum pratense L.*) (CP = 4.1%) hays were determined in nine 2-yr-old pregnant mares (mean BW = 447 kg; SD = 21). Diets were 100% forage. Timothy hay did not meet CP requirements for mares. Voluntary intake of alfalfa hay was higher ($P < 0.01$) than Matua hay. Intake of Timothy hay was lower ($P < 0.01$) than the mean of alfalfa and Matua hay. Rate of passage of forage was measured by passage of Cr-mordanted fiber. Passage rate and retention time did not differ between Matua and alfalfa hay; however, the retention times of Matua and alfalfa hays were shorter ($P < 0.01$) than for Timothy hay. Our results indicate that Matua hay is a forage that can be used safely for mares during gestation and early lactation and for their young foals.

Descriptors: mares, lactation, fodder crops, feed intake, digestion, performance, sexual reproduction, *Bromus catharticus*, alfalfa hay, foaling, liveweight, twinning, foals, liveweight gain, conception rate, pregnancy rate, mare milk, transit time, timothy hay, matua hay, *Phleum pratense L.*, *Medicago sativa L.*

Guillaume, D., G. Duchamp, J. Salazar Ortiz, and P. Nagy (2002). **Nutrition influences the winter ovarian inactivity in mares.** *Theriogenology* 58(2-4): 593-597. ISSN: 0093-691X.

Descriptors: horses, mares, nutrition, seasonality, endocrine function, reproduction, ovulation, chemeostasis, lactation.

Hintz, H.F. (1998). **Protein nutrition of the mare.** *Equine Practice* 20(4): 20-21. ISSN: 0162-8941.

NAL Call Number: SF951.E62

Descriptors: mares, animal feeding, animal nutrition, diet, proteins, feed intake, reproduction, lactation, behavior, feeding habits.

Hintz, H.F. (1995). **Nutrition of the geriatric horse.** *Cornell Nutrition Conference for Feed Manufacturers:* 195-197. ISSN: 0885-7687.

Descriptors: nutritional requirements, geriatric horses, aging, animal health, biological development, physiological requirements.

Lakritz, J., W.D. Wilson, A.E. Marsh, and J.E. Mihalyi (2000). **Effects of prior feeding on pharmacokinetics and estimated bioavailability after oral administration of a single dose of microencapsulated erythromycin base in healthy foals.** *American Journal of Veterinary Research* 61(9): 1011-1015. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Abstract: OBJECTIVE: To determine effects of prior feeding on pharmacokinetics and estimated bioavailability of orally administered microencapsulated erythromycin base (MEB) in healthy foals. ANIMALS: 6 healthy foals, 3 to 5 months old. PROCEDURE: Foals were given 2 doses of MEB (25 mg/kg of body weight, PO). One dose was administered after food was withheld overnight, and the other was administered after foals had consumed hay. The study used a crossover design with a 2-week period between doses. Blood was collected via a jugular vein prior to and at specific times after drug administration. Concentrations of erythromycin A and anhydroerythromycin A in plasma were determined, using high-performance liquid chromatography. Results pharmacokinetic analysis of plasma concentration-time data for food-withheld and fed conditions were compared. RESULTS: Plasma concentrations of erythromycin A for foals were lower after feeding than concentrations when food was withheld. Area under the plasma concentration-time curve, maximum plasma concentration, and estimated bioavailability were greater in foals when food was withheld than when foals were fed. Anhydroerythromycin A was detected in plasma after administration of MEB in all foals. CONCLUSIONS AND CLINICAL RELEVANCE: Foals should be given MEB before they are fed hay. Administration of MEB to foals from which food was withheld overnight apparently provides plasma concentrations of erythromycin A that exceed the minimum inhibitory concentration of *Rhodococcus equi* for approximately 5 hours. The dosage of 25 mg/kg every 8 hours, PO, appears appropriate.

Descriptors: microencapsulated erythromycin base (MEB), anti-bacterial agents, administration of

erythromycin, foals, feeding of hay, withholding feed prior to administration of MEB.

Malinowski, K., R.A. Christensen, A. Konopka, C.G. Scanes, and H.D. Hafs (1997). **Feed intake, body weight, body condition score, musculation, and immunocompetence in aged mares given equine somatotropin.** *Journal of Animal Science* 75(3): 755-760. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Sixteen 20- to 26-yr-old mares were given 0, 6.25, or 12.5 mg/d equine somatotropin (eST) to determine whether aged mares respond to ST with changes in feed intake, body weight, body condition score (based mostly on fat cover), or immunocompetence. Neither dry matter intake, body weight, nor body condition scores were altered during the 6 wk of eST injection. However, based on photographs taken to evaluate musculation before and after treatment (scores 0 to 4), mares given eST developed greater ($P < .07$) muscle definition ($1.8 \pm .6$ and $2.5 \pm .6$ for 6.25 and 12.5 mg eST/d, respectively) than control mares ($.7 \pm .4$). Total circulating leukocytes increased ($P < .05$) in both of the eST-treated groups during the 6-wk injection period, caused by an increase ($P < .05$) in granulocytes. Lymphocyte numbers were not altered. Granulocyte oxidative burst activity was not altered by eST treatment. Although lymphocyte proliferative responses to phytohemagglutinin, poke-weed mitogen, or lipopolysaccharide were not altered during the treatment period, lymphocyte proliferation in response to phytohemagglutinin and pokeweed mitogen increased twofold in eST-treated horses at 2 wk after eST treatment. In overview, the increased musculation and the increase in granulocyte numbers in mares given eST suggest that eST supplementation may improve the health and well-being of aged mares.

Descriptors: mares, somatotropin, feed intake, body weight, body condition, muscles, lymphocyte transformation, blood picture, dosage, dry matter, leukocyte count, oxidation, granulocytes.

Monahan, C.M., M.R. Chapman, H.W. Taylor, D.D. French, and T.R. Klei (1997). **Foals raised on pasture with or without daily pyrantel tartrate feed additive: comparison of parasite burdens and host responses following experimental challenge with large and small strongyle larvae.** *Veterinary Parasitology* 73(3-4): 277-289. ISSN: 0304-4017.

NAL Call Number: SF810.V4

Abstract: Three groups of foals were raised under different management programs in this study: Group 1 ($n = 6$) and Group 2 ($n = 6$) were raised with their dams on pasture; Group 3 foals ($n = 5$) were raised under parasite-free conditions. Mares and foals of Group 1 received daily pyrantel tartrate (PT) treatment with their pelleted feed ration, whereas mares and foals of Groups 2 and 3 received only the pelleted ration. Pasture-reared foals were weaned and moved to a heavily contaminated pasture for 5 weeks. Group 1 foals continued to receive daily PT treatment whereas Group 2 foals received only the pelleted feed ration. Following this period, all foals were moved into box stalls. Half of each group was challenged with $10(3)$ *Strongylus vulgaris* infective third-stage larvae (L3), $5 \times 10(3)$ *Strongylus edentatus* L3 and $10(5)$ mixed cyathostome L3; the remaining half served as unchallenged controls. Necropsy examinations were performed 6-week post-challenge for evaluation of parasite burdens and lesions. Daily PT treatment of Group 1 reduced the patent cyathostome infections of both mares and foals and was effective in reducing pasture burdens of infective larvae. Daily treatment of Group 1 foals during weaning continued to suppress EPG levels; however, it did not prevent large strongyle infections during the weaning period. Group 1 foals were more sensitive to challenge than Group 2 foals, which did not exhibit any post-challenge disturbances. Group 1 foals were equally susceptible to challenge as parasite-free foals.

Descriptors: foals, mares, antinematodal, intestinal mucosa, pyrantel, strongyl infections, *Strongylus vulgaris*, *Strongylus edentatus*, feces parasitology, ivermectin, larva, parasite egg count, cyathostome infections.

Ott, E.A. and J. Kivipelto (1998). **Influence of dietary fat and time of hay feeding on growth and development of yearling horses.** *Journal of Equine Veterinary Science* 18(4): 254-259. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: dietary fats, feeding habits, feeding frequency, growth of young horses, biological development, feed intake, energy metabolism, supplements, hay, nutrient intake.

Ousey, J.C., M. Ghatei, P.D. Rosedale, and S.R. Bloom (1995). **Gut hormone responses to feeding in healthy pony foals aged 0 to 7 days.** In: *Equine Reproduction VI, August 7, 1994-August 13, 1994, Caxambu, Brazil*, Biology

of Reproduction Monograph Series, Society for the Study of Reproduction: Madison, Wisconsin, USA, p. 87-96. ISBN: 0962792012.

NAL Call Number: SF768.2.H67E69 1995

Descriptors: foals, newborn animals, ponies, animal feeding, digestive system, gastrointestinal hormones.

Ousey, J.C., S. Prandi, J. Zimmer, N. Holdstock, and P.D. Rossdale (1997). **Effects of various feeding regimens on the energy balance of equine neonates.** *American Journal of Veterinary Research* 58(11): 1243-1251. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: foals, horse feeding, energy balance, energy intake, energy metabolism, feces, urine, energy expenditure, metabolizable energy, milk substitutes, total parenteral nutrition, mare milk, body weight, age differences.

Pagan, J.D. (2005). **Nutrition of the growing horse: feeding management to reduce DOD.** In: *Applied Equine Nutrition 1st Equine Nutrition Conference ENUCO, October 1, 2005, Hannover, Germany*, Wageningen Academic Publishers: Wageningen, Netherlands, p. 127-138.

Descriptors: nutrition, feeding regimen, nutritional management, pathogenesis, orthopedic disease, bone disease, lameness, mineral deficiency, nutrient balance.

Quadros, J.B.D.S., C.E. Furtado, E.D. Barbosa, M.B. Da Andrade, and A.G. Trevisan (2004). **Digestibilidade aparente e desenvolvimento de equinos em crescimento submetidos a dietas compostas por diferentes níveis de substituição do feno de tifton 85 pela casca de soja. [Apparent digestibility and development of growing horses fed diets with different levels of substitution of tifton 85 hay for soybean hulls].** *Revista Brasileira De Zootecnia* 33(3): 564-574. ISSN: 1516-3598.

Descriptors: growing horses, nutritional utilization, diet composition, soybean hulls, Tifton 85 hay, alternative feeds.

Language of Text: Portuguese.

Rassu, S.P.G., A. Cannas, G. Enne, R. Cherchi, and S. Delogu (1999). **Impiego dei lieviti vivi nell' alimentazione degli stalloni. [Live yeast use in stallion feeding].** In: *Proceedings of the ASPA Congress-Recent Progress in Animal Production Science, June 21, 1999-June 24, 1999, Italy*, Piacenza (Italy), Vol. 1, p. 809-811.

Abstract: The effects of diet supplementation with live yeasts (20 g/head d) on feed digestibility and sperm quality of stallions were evaluated. The results showed a slight positive effect, not statistically significant, on digestibility during the first month of administration. The effects on quantitative and qualitative traits of semen were more interesting; sperm was better in treated group during 2 months following the interruption of treatment: volume ml 47 +- 9 vs 34 +- 5, concentration 10⁶/ml 575 +- 806 vs 416 +- 39, live spermatozoa 83 +- 5 % vs 65 +- 29 % (P<0.05).

Descriptors: stallions, animal feeding, dietary supplements, yeasts, feed digestibility, semen quality, probiotics, nitrogen retention, feed conversion efficiency.

Language of Text: Italian with an English summary.

Siciliano, P.D. (2002). **Nutrition and feeding of the geriatric horse.** *Veterinary Clinics of North America, The Equine Practice* 18(3): 491-508. ISSN: 0749-0739.

NAL Call Number: SF951.V47

Abstract: Little is known regarding nutrient requirements and feeding of geriatric horses, and more effort should be placed on this area of equine nutrition research. That which is known suggests that some geriatric horses may not have different requirements than other mature horses, whereas others affected by disease or poor dentition may have special nutritional needs. In general, rations for geriatric horses should be based on high-quality roughage supplemented with complementary minerals and vitamins. The need for additional energy aside from that provided by the forage can be supplied by adding energy concentrates, such as cereal grains or fat, to the ration. Processing techniques involving heat, such as pelleting and extruding, are advised when cereal grains are included in the ration so as to improve starch digestibility in the small intestine and avoid starch overload in the hindgut and its subsequent problem (ie, colic, laminitis). In addition, the environment in which geriatric horses are fed should be one that promotes ease of ration consumption and eliminates factors that impair feed

consumption, such as competition from other horses and the need to travel relatively long distances (eg, grazing marginal pastures). Finally, strict attention should be paid to the body condition of geriatric horses so as to evaluate adequacy of the ration and the general health of the horse.

Descriptors: geriatric horses, nutrient requirements, feeding, nutritional requirements, provision of high-quality roughage, minimization of competition for feed with other horses, body condition scoring, general horse health, aged horses.

St. Lawrence, A.C., L.M. Lawrence, S.H. Hayes, and M. Adams (2001). **Plasma glucose responses of growing horses to different concentrate feeds.** *Journal of Dairy Science* 84(Suppl. 1): 208-209. ISSN: 0022-0302.

NAL Call Number: 44.8 J822

Descriptors: feeding practices, plasma glucose levels, concentrates, young horses, meeting abstract.

Notes: Meeting Information: Joint Meeting of the American Dairy Science Association, American Meat Science Association, American Society of Animal Science and the Poultry Science Association, Indianapolis, Indiana, USA; July 24-28, 2001.

Tomczynski, R., Z. Kaleta, D. Minakowski, E. Jastrzebska, and E. Wadas (2002). **Studies on the use of flavour preparations in the feed mixtures for adult horses.** *Polish Journal of Natural Sciences*(12): 167-196. ISSN: 1643-9953.

NAL Call Number: QH301.N388

Abstract: The preference tests involved granulated feed mixtures with the following flavour additives made by ETOL, Slovenia: Lucerne (Flavour 12021), hay (Flavour 12023), vanilin (Flavour 12017). Horses were interested in flavoured feed after a 4-day adaptation period. Using additives of hay or lucerne flavour in a feed mixture used for feeding stallions had a favourable influence on the intake. It was also found that additives of vanilin Flavour 12017 and of lucerne Flavour 12021 had a favourable influence on the intake of nutritive fodder.

Descriptors: preference testing, granulated feed mixtures, Lucerne, hay, vanilin, flavored feed, stallions, effect of feed additives on intake of nutrient fodder, feed additives, feeding preferences.

Tomczynski, R., D. Miniakowski, Z. Kaleta, E. Wadas, and E. Jastrzebska (2003). **Studies on the use of flavour preparations in the feed mixtures for foals.** *Polish Journal of Natural Sciences*(13): 135-141. ISSN: 1643-9953.

NAL Call Number: QH301.N388

Abstract: Flavour additives in the nutrition of foals have got a limited influence on the intake of nutritive fodder. The addition of examined flavour preparations to the feed mixtures used in the nutrition of 2 month old suckling foals did not have any effect on the intake of feed. The foals at the age from 2 to 5 months showed an increased intake of the nutritive fodder, with the addition of milk flavour in particular, and the mixtures with vanilin flavour.

Descriptors: flavor additives in feed, foal nutrition, feeding preferences, effect of flavor on feed intake, nutritive fodder, milk flavor, lucerne, milk, hay, vanillin, foal nutrition.

Van der Meer, F.J.U.M. and B. Colenbrander (1999). **Sperm production in the horse: the influence of restricted feeding during the prepubertal and pubertal period.** *Reproduction in Domestic Animals* 34(3-4): 361-365. ISSN: 0936-6768.

NAL Call Number: SF105.A1Z8

Descriptors: horses, puberty, sexual development, effects of feeding practices, restricted feeding.

Wilsher, S. and W.R. Allen (2003). **The effects of maternal nutrition on placental and fetal development in maiden Thoroughbred mares.** In: *Proceedings of a Workshop on Embryonic and Fetal Nutrition, May 15, 2003-May 18, 2003, Ravello, Italy*, Havemeyer Foundation Monograph Series, p. 70-71.

Descriptors: age, animal nutrition, body condition, fetal development, fetal growth, fetus, mares, placenta, plane of nutrition, pregnancy, Thoroughbred, horses.

Wodarczyk-Szydowska, A., W. Nowacki, M. Florek, and Z. Staroniewicz (2005). **Swoista odpornosc posiarowa zrebiat w stadninie koni penej krwi. [Specific colostral protection of foals in a thoroughbred stable].**

Medycyna Weterynaryjna 61(11): 1296-1299. ISSN: 0025-8628.

Descriptors: foals, immune system, antibody levels, colostrum, pathogen antibodies.

Language of Text: Polish.

Youngblood, R.C., B.J. Rude, D.L. Christiansen, N.M. Filipov, R. Hopper, N.S. Hill, B.P. Fitzgerald, and P.L. Ryan (2003). **Effects of feeding endophyte-infected tall *Fescue* diets on embryo survival in mares during early gestation.** *Journal of Dairy Science* 86(Suppl. 1): 73. ISSN: 0022-0302.

NAL Call Number: 44.8 J822

Descriptors: horses, pregnant mares, nutrition, reproductive system, endophyte infected tall *Fescue* plants, toxicology.

Notes: Meeting Information: Joint Annual Meeting of the American Dairy Science Association, the American Society of Animal Science and the Mexican Association of Animal Production, Phoenix, Arizona, USA; June 22-26, 2003.

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Nutrition Concentrates

Al-Jassim, R.M. (2006). **Supplementary feeding of horses with processed sorghum grains and oats.** *Animal Feed Science and Technology* 125(1-2): 33-44. ISSN: 0377-8401.

Descriptors: in vitro hind gut fermentation tests, processing of sorghum grain, starch digestion, gastrointestinal tract.

Andersson, K. (1995). **Effekter av utfodring med hoegfethavre till travhaestar. [Effects of feeding "high fat oats" to Standardbred horses].** Dissertation, Swedish Agricultural University: Uppsala, Sweden. 51 p.

Descriptors: Standardbred horses, racehorses, oats, lipid content, digestibility, performance related to high fat diet, animal feeding, nutritive value.

Language of Text: Swedish.

Notes: Examensarbete - Sveriges Lantbruksuniversitet, Institutionen foer Husdjurens Utfodring och Vaard (Sweden). no. 72.

Austbo, D. and H. Volden (2006). **Influence of passage model and caecal cannulation on estimated passage kinetics of roughage and concentrate in the gastrointestinal tract of horses.** *Livestock Science* 100(1): 33-43. ISSN: 1871-1413.

Descriptors: evaluation methods, non-linear passage model, total tract retention time, hindgut fractional passage rates, hay, concentrates, effect of caecal cannulation on passage parameters.

Notes: Meeting Information: Nutritive Value of Concentrates in Horses. Papers presented at the 54th EAAP meeting, Rome, Italy, 2003.

Bedoret, D., B. de Moffarts, E. van Erck, C. Tual, A. d'Hollander, P. Lekeux, and T. Art (2006). **Utilisation d'un concentré riche en fibres pour la prévention des crises chez le cheval poussif. [Use of concentrate rich in fibre to prevent attacks in horses affected by dust].** *Pratique Veterinaire Equine* 38(149): 57-63. ISSN: 0395-8639.

Online: www.pointveterinaire.com

Descriptors: allergic inflammatory diseases, heaves, organic dust inhalation, prevention and treatment methods, risk factors.

Language of Text: French with an English summary.

Cabrera, L., C.E. Furtado, and N.A.N. Fonseca (2005). **Digestibilidade aparente dos nutrientes de dietas com substituição parcial da proteína do farelo de soja pela proteína da torta de girassol para equinos. [Apparent digestibility of equine diets nutrients with partial substitution of soyabean meal with sunflower cake proteins].** In: *XVI Reuniao Nacional de Pesquisa de Girassol, IV Simposio Nacional sobre a Cultura do Girassol, de Documentos Embrapa Soja, 4-6 de outubro, Londrina PR, Brazil*, Embrapa Centro Nacional de Pesquisa de Soja: Londrina, Brazil, Vol. 261, p. 135-137.

Descriptors: nutrition, sunflower oilmeal, soybean oilmeal, diet composition, crude protein, neutral detergent fiber, dry matter, acid detergent fiber, ether extracts, digestion.

Language of Text: Portuguese with an English summary.

Copetti, M.V., J.M. Santurio, A.A. Boeck, R.B. Silva, L.A. Bergermaier, I. Lubeck, A.B. Leal, A.T. Leal, S.H. Alves, and L. Ferreiro (2002). **Agalactia in mares fed with grain contaminated with *Claviceps purpurea*.** *Mycopathologia* 154(4): 199-200. ISSN: 0301-486X.

NAL Call Number: 450 M994

Abstract: This article reports an outbreak of intoxication of female horses with *Claviceps purpurea* in southern Brazil. The outbreak affected twelve pregnant mares which were fed with black oat (*Avena strigosa*) during the pre-delivery period. Underdevelopment of the mammary gland in the pre-delivery period resulting in post-delivery agalactia was the most pronounced finding. These mares delivered weak and unviable foals, which showed no suckling reflex and died within a few hours of birth. Laboratory analysis of oat samples fed to the animals resulted in the identification of *Claviceps purpurea sclerotia*. The fungus was identified in 0.22% of the examined seeds.

Descriptors: *Avena sativa*, black oat, horse diseases, feed toxins, *Claviceps purpurea*, Brazil, pregnant mares, agalactia, underdevelopment of mammary gland, weak and unviable foals, fungus in seeds.

Crandell, K.G., J.D. Pagan, P. Harris, and S.E. Duren (1999). **A comparison of grain, oil and beet pulp as energy sources for the exercised horse.** *Equine Veterinary Journal* 30(Suppl.): 485-489. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Abstract: High-grain diets for the exercising horse were compared with diets which provided 15% of the total caloric intake from either vegetable oil or a highly fermentable fibre source (beet pulp). Six Thoroughbreds age 3 years were fed one of 3 diets or 5 weeks in a replicated 3 x 3 Latin square. The CONTROL diet was 3.65 kg of sweet feed (SF), 0.9 kg of a protein/vitamin/mineral pellet and 5.45 kg of hay cubes. The FAT diet replaced 1.15 kg of SF with 0.45 kg of soybean oil and the FIBRE diet replaced 1.15 kg of SF with 1.36 kg of beet pulp. Horses were exercised 3 times per week on a high-speed treadmill. During the last week of each period, the horses performed a standardised exercise test (SET). A series of blood samples was drawn immediately before feeding and every 0.5 h for 3 h after feeding, throughout the exercise bout and 30 min post exercise. Plasma was analysed for lactate, glucose, cortisol, insulin, packed cell volume, total protein and triglycerides. Water intake was measured at regular intervals during SET day. Blood glucose was lower ($P < 0.05$) in the FAT-fed horses during the 3 h post feeding as compared to either CONTROL or FIBRE-fed horses. Insulin was lower ($P < 0.05$) in the FAT-fed both post feeding and throughout exercise. Cortisol was lower ($P < 0.05$) in the FAT than the CONTROL-fed during exercise. Following exercise, the FAT-fed drank more water ($P < 0.01$) than either CONTROL or FIBRE-fed. Substituting 15% of DE as vegetable oil had a greater effect on metabolic response to exercise than a 15% substitution of beet pulp.

Descriptors: energy metabolism, physical conditioning, dietary fats, vegetable oil, beet pulp, blood glucose levels, insulin, cortisol, water intake, effects of exercise, Thoroughbreds.

Da Stein, R.B., L.R.A. De Toledo, F.Q. De Almeida, A.C. Arnaut, L.T. Patitucci, J. Soares Neto, and V.T.M. Da Costa (2005). **Uso do farelo de vagem de algaroba (*Prosopis juliflora* (Swartz) D.C.) em dietas para equinos. [Effects of feeding mesquite pod meal (*Prosopis juliflora* (Swartz) D.C.) for horses].** *Revista Brasileira De Zootecnia* 34(4): 1240-1247. ISSN: 1516-3598.

Descriptors: crude protein, diets, digestibility, dry matter, energy digestibility, fiber, mare feeding, mares, organic matter, pods, woody plants, horses, plants, *Prosopis juliflora*.

Language of Text: Portuguese with an English summary.

De Oliveira, K. and C.E. Furtado (2001). **Digestibilidade aparente de dietas com diferentes níveis de farelo de canola para cavalos. [Apparent digestibility of diets with different levels of canola meal to equines].** *Revista Brasileira De Zootecnia* 30(1): 181-186. ISSN: 1516-3598.

Descriptors: horse diets, canola meal as an alternative protein source, soybean meal, crude protein alternatives, nutrient digestibility, isoproteic diets, isocaloric diets, fecal analysis.

Language of Text: Portuguese.

Duhlmeier, R., T. Guck, E. Deegen, R. Busche, and H.P. Sallmann (2003). **Auswirkungen uberkalorischer Fettfütterung auf den Fettstoffwechsel bei Shetland Ponys. [Effects of excess caloric fat feeding on the lipid metabolism in Shetland ponies].** *Deutsche Tierärztliche Wochenschrift* 110(4): 170-174. ISSN: 0341-6593.

NAL Call Number: 41.8 D482

Abstract: To investigate the influence of overweight and dietary fat supplementation on lipid and insulin glucose metabolism of Shetland ponies, eight Shetland pony geldings were fed a hypercaloric (30 MJ DE/150 kg bwt. and day) fat diet (10% fat as soybean oil) or a carbohydrate control diet for nine months until ponies gained an overweight of 15%. Afterwards oral glucose tolerance tests (oGTT; 5, 6 mmol/kg bwt.) were performed after a 12 hour fast and after a fast which led to an increase of plasma triglyceride concentrations to a threshold of 3 mmol/l (36-65 hrs.). Plasma concentrations of glucose, insulin, triglycerides and non esterified fatty acids (NEFA) were determined for 480 minutes after the glucose load. Ponys having had received the control diet tended to a higher insulin secretion in case of both oGTTs, whereas the glucose tolerance was similar in both groups but lower than in ponies of normal weight. During the oGTTs after fasting leading to the plasma triglyceride threshold, triglyceride concentrations decreased significantly ($p < 0.05$) faster and stronger in fat fed ponies. Additionally, fat fed pony showed significantly ($p < 0.05$) lower NEFA levels. The results of this study demonstrate a positive effect of fat feeding on the triglyceride clearance of overweight Shetland ponies.

Descriptors: dietary fat, overweight ponies, Shetland ponies, hypercaloric fat diet, carbohydrate control diet, oral glucose tolerance tests, triglyceride clearance, fat feeding.

Language of Text: German.

Geelen, S.N.J., W.L. Jansen, M.M. Sloet Van Oldruitenborgh Oosterbaan, H.J. Breukink, and A.C. Beynen (2001). **Fat feeding increases equine heparin-released lipoprotein lipase activity.** *Journal of Veterinary Internal Medicine* 15(5): 478-481. ISSN: 0891-6640.

NAL Call Number: SF601.J65

Descriptors: horses, fat intake, enzymes, heparin-released plasma lipoprotein lipase, hay, concentrates with variable levels of fat, soybean oil, trotters, blood sampling, plasma triacylglycerol concentrations, fat feeding, oxidative capacity of skeletal muscle.

Goodwin, D., H.P.B. Davidson, and P. Harris (2005). **Selection and acceptance of flavours in concentrate diets for stabled horses.** *Applied Animal Behaviour Science* 95(3-4): 223-232. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: feed concentrates, flavor, feeding preferences, palatability.

Goodwin, D., H.P.B. Davidson, and P. Harris (2005). **Sensory varieties in concentrate diets for stabled horses: effects on behaviour and selection.** *Applied Animal Behaviour Science* 90(3-4): 337-349. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: feed concentrates, flavor, animal preferences.

Harris, P.A., J.D. Pagan, K.G. Crandell, and N. Davidson (1999). **Effect of feeding Thoroughbred horses a high unsaturated or saturated vegetable oil supplemented diet for 6 months following a 10 month fat acclimation.** *Equine Veterinary Journal* 30(Suppl.): 468-474. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Abstract: This study looked at the effect of feeding diets supplemented with either a predominantly saturated or unsaturated vegetable oil over a prolonged period to exercising horses. Eight Thoroughbred horses were assigned to 2 diet treatments and for 10 months were fed Timothy hay and oats, together with a fortified sweet feed supplemented with either a predominantly unsaturated (Un) or a saturated (S) vegetable oil so that approximately 19% DE (Digestible Energy) came from dietary fat and approximately 12% from either the Un or S source (AC). An increased amount of Un or S fortified sweet feed, replacing the oats, was then fed for a further 6 months (HF) so that approximately 27% DE came from fat and approximately 20% from the Un or S vegetable oil. Standardised incremental treadmill exercise (8-12 m/s) tests (STEP) and duplicate oral glucose tolerance tests (TOL) were carried out after 3, 6 and 9 months of the AC diet and after 3 and 6 months on the HF diet. There was no significant effect of dietary treatment or when the tests were undertaken (time) on the insulin or lactate responses to the STEP tests. Overall there was a significant ($P < 0.05$) effect of time and treatment on the glucose response, but there was no difference between treatments at the first and last tests or between the results for these tests or between the endAC and endHF tests. No significant effect of treatment or time was seen on the TOL glucose response (% change from Time '0') although there was a trend for the

glucose concentrations to be lower and the insulin responses higher (nonsignificant) in the S treatment group. No significant effect of treatment on haematological parameters, monitored monthly, was found. Total protein and gamma glutamyl transferase remained within the normal range throughout. There was a significant effect of treatment ($P < 0.05$) on cholesterol and triglycerides with higher concentrations in the S group from the first (1 month) sample. Linoleic acid was the main fatty acid in all the 4 plasma lipid classes with slightly, but significant ($P < 0.05$), higher concentrations in Un for the cholesterol ester and phospholipid classes. There was no effect of time. Overall, the total resting plasma fatty acid content was significantly higher ($P < 0.05$) with S at the sample points (endAC and endHF). No adverse effects of feeding either diet on apparent coat condition or hoof appearance were seen apart from an apparent increase in the grease score. Many of the parameters assessed showed significant improvements with time ($P < 0.05$). In conclusion, no apparent adverse effects of feeding a diet supplemented with either an unsaturated or saturated vegetable oil for 6 months at approximately 20% DE after 10 months at approximately 12% DE were identified and there were no apparent disadvantages of feeding a saturated vegetable oil supplemented diet compared with an unsaturated one.

Descriptors: vegetable oil, Thoroughbreds, effects of sweet feed, timothy hay, oats, oral glucose tolerance tests, exercise, hoof and coat condition, comparison of saturated and unsaturated vegetable oil.

Hill, J. (2002). **Effect of level of inclusion and method of presentation of a single distillery by-product on the processes of ingestion of concentrate feeds by horses.** *Livestock Production Science* 75(2): 209-218. ISSN: 0301-6226.

NAL Call Number: SF1.L5

Descriptors: horses, feed intake, concentrates, distillers' residues, feeding behavior, ingredients, ingestion.

Hussein, H.S. and L.A. Vogedes (2003). **Review: Forage nutritional value for equine as affected by forage species and cereal grain supplementation.** *Professional Animal Scientists* 19(5): 388-397. ISSN: 1080-7446.

NAL Call Number: SF51.P76

Descriptors: horses, forage evaluation, forage quality, forage composition, literature reviews.

Hussein, H.S., L.A. Vogedes, G.C.J. Fernandez, and R.L. Frankeny (2004). **Effects of cereal grain supplementation on apparent digestibility of nutrients and concentrations of fermentation end-products in the feces and serum of horses consuming alfalfa cubes.** *Journal of Animal Science* 82(7): 1986-1996. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, nutrition, nutrient digestibility, alfalfa cubes, fermentation, cereal grains, supplements.

Johnson, P.J., S.W. Casteel, and N.T. Messer (1997). **Effect of feeding deoxynivalenol (vomitoxin)-contaminated barley to horses.** *Journal of Veterinary Diagnostic Investigation* 9(2): 219-221. ISSN: 1040-6387.

NAL Call Number: SF774.J68

Descriptors: horses, barley, vomitoxin, toxicity, susceptibility, deoxynivalenol contamination.

Karlsson, C.P., J.E. Lindberg, and M. Rundgren (2000). **Associative effects on total tract digestibility in horses fed different ratios of grass hay and whole oats.** *Livestock Production Science* 65(1/2): 143-153. ISSN: 0301-6226.

NAL Call Number: SF1.L5

Descriptors: oats, grass hay, digestibility, hay:oat ratios, feeds, dry matter, digestible energy, nutrient availability, urine analysis, digestive tract.

Keir, A.A., H.R. Stampfli, and J. Crawford (1999). **Outbreak of acute colitis on a horse farm associated with tetracycline-contaminated sweet feed.** *Canadian Veterinary Journal* 40(10): 718-720. ISSN: 0008-5286.

NAL Call Number: 41.8 R3224

Abstract: Exposure of a group of horses to tetracycline-contaminated feed resulted in acute colitis and subsequent death in one horse and milder diarrhea in 3 others. The most severely affected animal demonstrated clinical and pathological findings typical of colitis X. The other herdmates responded well to administration of zinc bacitracin.

Descriptors: tetracycline poisoning, acute colitis pathology, diarrhea, fatal outcome of food contamination, horses, zinc bacitracin.

Lopes, M.A.F., N.A.I. White, M.V. Crisman, and D.L. Ward (2004). **Effects of feeding large amounts of grain on colonic contents and feces in horses.** *American Journal of Veterinary Research* 65(5): 687-694. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, feeding, management practices, digestion, digestive system, amount of concentrates.

Manzano, A., A.R. De Freitas, S.N. Esteves, and N.J. Novaes (1999). **Polpa de citros peletizada na alimentacao de equinos. [Pelleted citrus pulp in equine feeding].** *Revista Brasileira De Zootecnia* 28(6): 1327-1332. ISSN: 1516-3598.

Descriptors: horses, nutrition, feeding practices, corn alternatives, pelleted citrus pulp.

Language of Text: Portuguese.

Meyer, H. and H.P. Sallmann (1996). **Fettfuetterung beim Pferd. [Fat in horse feeding].** *Ubersichten Zur Tierernahrung (Germany)* 24(2): 199-227. ISSN: 0303-6340.

Descriptors: feeding horses, fats, oils, digestibility, supplements, lipid content, digestive absorption, blood composition, triglycerides, cholesterol, phospholipids, free fatty acids, microbial flora, nutrient availability, feeding behavior, energy metabolism.

Language of Text: German.

Miraglia, N. and W. Martin Rosset (2006). **Nutritive value of concentrates in horses. Papers presented at the 54th EAAP meeting, Rome, Italy, 2003.** *Livestock Science* 100(1): 69. ISSN: 1871-1413.

Descriptors: diet composition, nutritive value, processed oat grains, digestibility, fiber-rich concentrates, resistant starch content, in vitro organic matter digestibility, digestive passage kinetics, effects of feed processing, resistant starch content, energy and protein value prediction, degradation profiling.

Notes: Special Issue.

Raymond, S.L., T.K. Smith, and H.V.L.N. Swamy (2005). **Effects of feeding a blend of grains naturally contaminated with *Fusarium* mycotoxins on feed intake, metabolism, and indices of athletic performance of exercised horses.** *Journal of Animal Science* 83(6): 1267-1273. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: An experiment was conducted to determine the effect of feeding blends of grains naturally contaminated with *Fusarium* mycotoxins to mature, exercised horses, and to test the efficacy of a polymeric glucomannan mycotoxin adsorbent (GM polymer) in preventing *Fusarium* mycotoxicoses. Six mature, mixed-breed mares with an average BW of 530 kg were assigned to one of three dietary treatments for 21 d in a replicated 3 x 3 Latin square design. Feed consumed each day was a combination of up to 3.5 kg of concentrates and 5.0 kg of mixed timothy/alfalfa hay (as-fed basis). The concentrates fed included 1) manage; 2) blend of contaminated grains; and 3) contaminated grains + 0.2% GM polymer (MTB-100, Alltech Inc., Nicholasville, KY). Concentrates containing contaminated grains averaged 11.0 ppm deoxynivalenol, 0.7 ppm 15-acetyldeoxynivalenol, and 0.8 ppm zearalenone (as-fed basis). Feed intake and BW were monitored over a 21-d period. Horses were maintained on a fixed exercise schedule throughout the experiment. At the end of the experiment, each horse completed a time-to-fatigue treadmill step test. Variables measured during pretest, each step of the test, and 5 and 10 min posttest were as follows: 1) time-to-fatigue, 2) heart rate, 3) hematological variables, and 4) serum lactate concentration. Each step consisted of 2 min of fast trot with a 2% increase in incline after each 2 min. Feed intake by horses fed contaminated grains was decreased compared with controls throughout the experiment ($P < 0.05$). Supplementation of 0.2% GM polymer to the contaminated diet did not alter feed intake by horses compared with those fed the unsupplemented contaminated diet. All hay was consumed regardless of concentrate fed. Weight loss from 0 to 21 d was observed in horses fed contaminated grains compared with controls ($P < 0.05$). No effect of diet was seen on variables used to measure athletic ability, although the results showed an expected response to exercise for a fit horse. We conclude that exercised horses are susceptible to *Fusarium* mycotoxicoses as indicated by appetite suppression and weight loss.

Descriptors: horses, feeding, concentrates, effects of exercise, clinical signs of contamination, natural *Fusarium* mycotoxins.

Sallmann, H.P., O. Schmidt, R. Duehlmeier, H. Fuhrmann, and E. Deegen (1998). **Effects of feeding fat on**

circulating concentrations of metabolites and hormones in Shetland ponies. *Fett Wissenschaft Technologie: Organ Der Deutschen Gesellschaft Für Fettwissenschaft E.V. [Fat Science Technology]* 100(8): 379. ISSN: 0931-5985.

NAL Call Number: TP670.F472

Descriptors: horse nutrition, metabolism, fat content, metabolites, hormones, hyperlipidemia, Shetland ponies, meeting abstract.

Language of Text: German and English.

Notes: Meeting Information: 52nd International Congress of the German Society for the Study of Lipids, Magdeburg, Germany; September 13-15, 1998.

Sarkijarvi, S. and M. Saastamoinen (2006). **Feeding value of various processed oat grains in equine diets.** *Livestock Science* 100(1): 3-9. ISSN: 1871-1413.

Descriptors: digestibility analysis, processed oats, untreated oats, hulled oats, autoclave-processed oats, autoclave-processed hulled oats, Dantoaster-processed oats, Dantoaster-processed hulled oats, dry matter, organic matter, crude fat.

Notes: Meeting Information: Nutritive Value of Concentrates in Horses. Papers presented at the 54th EAAP meeting, Rome, Italy, 2003.

Schmidt, O., E. Deegen, H. Fuhrmann, R. Duhlmeier, and H.P. Sallmann (2001). **Effects of fat feeding and energy level on plasma metabolites and hormones in Shetland ponies.** *Journal of Veterinary Medicine Series A* 48(1): 39-49. ISSN: 0931-184X.

NAL Call Number: 41.8 Z5

Descriptors: blood plasma, metabolites, dietary fat, feed intake, energy intake, energy content, feed supplements, lipid metabolism, triacylglycerols, lipoprotein lipase, insulin, glucose tolerance, Shetland ponies.

Williams, C.A., D.S. Kronfeld, W.B. Staniar, and P.A. Harris (2001). **Plasma glucose and insulin responses of Thoroughbred mares fed a meal high in starch and sugar or fat and fiber.** *Journal of Animal Science* 79(8): 2196-2201. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Plasma concentrations of glucose and insulin following a meal were compared in twelve Thoroughbred mares fed a pelleted concentrate (PC), a traditional sweet feed high in sugar and starch (SS), or a feed high in fat and fiber (FF). The feeds had similar DE and CP but differed in fat (19, 32, and 166 g/kg DM, respectively), NDF (199, 185, and 369 g/kg DM, respectively) and nonstructural carbohydrates (574, 645, and 247 g/kg, respectively). Mares were randomly assigned to two groups balanced for foaling date and weight. All mares received PC in late gestation; then, after foaling, one group was fed SS and the other FF for trials in early and late lactation. Mares were placed in stalls and deprived of feed overnight. A series of blood samples was collected via a jugular catheter from 0 (baseline) to 390 min after consumption of 1.82 kg of feed. Plasma was analyzed for glucose and insulin. Baseline values, peak values, and areas under curves (AUC) were compared by ANOVA. Baseline values were 74.7 +/- 10.9 mg/dL for glucose and 5.86 +/- 1.80 mIU/L for insulin for all diets and stages. Responses to PC did not differ between the two groups ($P > 0.34$), indicating the groups were metabolically similar. Peak plasma glucose and insulin concentrations were higher ($P < 0.001$) in the SS group than in the FF group during early and late lactation. Similarly, glucose and insulin AUC were larger ($P < 0.003$) in SS than in FF during early and late lactation. These results indicate that metabolic fluctuations are moderated by the replacement of sugar and starch with fat and fiber. This replacement may reduce the risk of certain digestive and metabolic disorders that have been linked to feeding meals of grain-based concentrates to pregnant or lactating mares.

Descriptors: mares, blood sugar, glucose, blood plasma, insulin, pelleted feeds, starch, sugar, dietary fat, dietary carbohydrate, fiber, concentrates, digestible energy, pregnancy, metabolism, Thoroughbreds.

Zeyner, A., J. Bessert, and J.M. Gropp (2002). **Effect of feeding exercised horses on high-starch or high-fat diets for 390 days.** *Equine Veterinary Journal* 34(Suppl.): 50-57. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Abstract: Our hypothesis was that, because horses have not evolved as fat eaters, there may be negative metabolic long-term effects of feeding a high fat diet. The objective of the present study was to identify these

long-term effects and compare them with the effects of isoenergetic long-term high starch feeding. This randomised block study with 20 exercised horses looked at the effect of feeding either a high starch (HS) or a high fat (HF) diet type in 3 periods during stabling (Stable 1), pasture, and stabling (Stable 2) over 390 days. The horses received a HS or HF concentrate, straw, hay and 6 h pasture/day in the pasture period. HF horses gained weight (2% of initial bwt) and, therefore, fat intake was reduced (from 1.43 to 0.88 g/kg bwt/day). Blood plasma glucose, total protein, albumins, gamma-globulins, free fatty acids, phospholipids and cholesterol concentrations were higher but urea concentration was lower with HF compared to HS feeding ($P < 0.05$). Plasma concentrations of triglycerides, bilirubin and pre-beta lipoproteins were unaffected by the diet type. There were period effects ($P < 0.05$) for all variables except triglycerides and pre-beta lipoproteins. In contrast to HS, in HF the quotient alpha/beta lipoproteins rose ($P < 0.05$) throughout the stable periods and decreased ($P < 0.05$) during 'pasture'. Glutamic acid dehydrogenase, gamma-glutamyl transferase, alkaline phosphatase, aspartate aminotransferase, creatine kinase and lactate dehydrogenase activity in sera were within the normal range. In conclusion, on the precondition that substantial bodyweight changes were prevented, no apparent adverse effects of long-term high fat feeding were identified and there were no apparent disadvantages of feeding on high fat compared with high starch diets.

Descriptors: long-term effects of high fat diets, horses, effects of high starch diets, lipoprotein concentrations, blood sampling, horse metabolism, weight gain, dietary carbohydrates.

Zeyner, A., A. Schindler, A. Dittrich, and J.M. Gropp (2000). **Untersuchungen zur Akzeptanz und Verdaulichkeit von fettreichem Futter beim Pferd. [Investigations on acceptance and digestibility of fat enriched feed in horses]**. In: *Proceedings of the Society of Nutrition Physiology, March 7, 2000-March 9, 2000, Göttingen, Germany*, Inst. fuer Tierernaehrung, Ernaehrungsschaeden und Diaetetik: Leipzig University, Germany, Vol. 9, 50 p. ISBN: 3769040937.

Descriptors: horses, compound feeds, fats, soybean oil, feed intake, behavior, digestibility, nutrients, behavior, feeding habits, feeds, oils, plant oils, processed plant products, processed products, soybean products.

Language of Text: German.

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Nutrition Roughages

Benyovszky, B.M., J. Hausenblasz, K. Penksza, L. Szeman, and K. Eros (1999). **Odvisnost konzumacije sena pri konjih od njegove vsebnosti vlaknine. [Relation between preference of hay consumed by horses and hay's fibre content]**. In: *Proceedings of the Conference on Nutrition of Domestic Animals "Zadravec-Erjavec Days", October 28, 1999-October 29, 1999, Radenci, Slovenia, Murska Sobota, Slovenia*, Vol. 8, p. 158-164.

Descriptors: horses, hay preference, proximate composition, crude fiber, chemical composition, feeding preferences, palatability, behavior, feeding habits, quality of roughage.

Campbell, T.E., P.A. Harris, H.C. Doughty, and M.N. Sillence (2005). **Effect of chaff quantity and length on rate of intake in horses fed a concentrate diet.** *Asia Pacific Journal of Clinical Nutrition* 14(Suppl.): S80.

Abstract: Background - Grains are commonly fed to horses that have a high energy requirement. However, large quantities and fast consumption of grain can result in disorders such as laminitis, colic, tying-up, gastric ulcers and fractious behaviour. Thus, controlling the rate of grain intake is an important aspect in managing equine nutrition. Objectives - To measure the relationship between chaff quantity and length and the rate of intake of oats. Design - Each morning, six geldings (BW 479 +/- 18 kg) were fed a constant meal of oats at 3 g/kg bodyweight in combination with either longer ground wheaten chaff (4 cm), or short chopped wheaten chaff (< 2 cm) at one of five different addition rates in a random latin square design. Ryegrass/clover hay was provided each afternoon to meet maintenance energy requirements. Outcomes - Rate of intake varied with chaff quantity (P <0.001, ANOVA for repeated measures), but was not affected by chaff length. A maximal decrease in rate of intake occurred at the addition rate of 50% chaff. Conclusion - Relative to earlier studies a large amount of chaff was required to decrease rate of intake. It is not clear whether this is due to meal size, chaff type, or chaff processing method. Chaff length appeared to have no effect on rate of intake. However, the long chaff was ground and not chopped, which would have decreased the surface area and chewing required for ingestion. Further research is required to standardise a method of measuring rate of intake and to explore differences in chaff properties.

Descriptors: feeding grain to horses, rate of grain intake, chaff quantity and length, intake of oats, rate of intake.

Coverdale, J.A., J.A. Moore, H.D. Tyler, and P.A. Miller Auwerda (2004). **Soybean hulls as an alternative feed for horses.** *Journal of Animal Science* 82(6): 1663-1668. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: hay substitute, soybean hulls, highly digestible fiber source, starch-free feed source, Quarter horse geldings, cannulated animals, cecal fermentation, equine diet formulations.

De Fombelle, A., V. Julliand, C. Drogoul, and E. Jacotot (2001). **Feeding and microbial disorders in horses. 1. Effects of an abrupt incorporation of two levels of barley in a hay diet on microbial profile and activities.** *Journal of Equine Veterinary Science* 21(9): 439-445. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, horse feeding, barley, cecum, colon, digesta, bacterial count, intestinal microorganisms, hay, pH, lactic acid, volatile fatty acids.

- De Oliveira, G.J.C., J.A.D.F. Lima, K.V. Araujo, E.T. Fialho, A.G. Bertechini, J.R.O. Perez, and R.T.F. Freitas (2002). **Influencia da adicao de pectina e farelo de soja sobre a digestibilidade aparente de nutrientes, em equinos. [Effect of pectin and soybean meal addition on the apparent digestibility of nutrients, in horses].** *Revista Brasileira De Zootecnia* 31(3): 1184-1192. ISSN: 1516-3598.
Descriptors: pectin, soybean meal, nutrient digestibility, apparent digestibility of dry matter, crude fiber utilization, neutral detergent fiber (NDF), acid detergent fiber (ADF), hemicellulose.
Language of Text: Portuguese.
- Drogoul, C., C. Poncet, and J.L. Tisserand (2000). **Feeding ground and pelleted hay rather than chopped hay to ponies. 1. Consequences for in vivo digestibility and rate of passage of digesta.** *Animal Feed Science and Technology* 87(1-2): 117-130. ISSN: 0377-8401.
NAL Call Number: SF95.A55
Descriptors: hay diet, tract digestibility, fiber digestion, chopped hay, pelleted hay, ground hay, digesta rate of passage.
- Dulphy, J.P., W. Martin Rosset, H. Dubroeuq, J.M. Ballet, A. Detour, and M. Jailler (1997). **Compared feeding patterns in ad libitum intake of dry forages by horses and sheep.** *Livestock Production Science* 52(1): 49-56. ISSN: 0301-6226.
NAL Call Number: SF1.L5
Descriptors: horses, sheep, nutrition, behavior, consumption preference, crude protein, cell wall content.
- Fleurance, G., P. Duncan, and B. Mallevaud (2001). **Daily intake and the selection of feeding sites by horses in heterogeneous wet grasslands.** *Animal Research* 50(2): 149-156.
Descriptors: horses, mares, grazing behavior, feeding preference, forage variety.
- Katsuki, R., Y. Asai, and H. Fujikawa (1998). **Effect of exercise on the apparent energy digestibility of timothy and alfalfa hay in Thoroughbred horses.** *Journal of Equine Science* 9(1): 29-31. ISSN: 1340-3516.
NAL Call Number: SF277.J37
Descriptors: effect of exercise, energy digestion, timothy hay, alfalfa hay, young horses, two-year old horses, digestibility, digestible energy, comparison of energy digestibility between exercised and rested horses.
- Kawai, M. (2000). **Utilization of roughage by horses: Intake and digestibility in Hokkaido [Japan] native horses.** *Proceedings of Japanese Society for Animal Nutrition and Metabolism* 44(1): 31-40. ISSN: 0286-4754.
Descriptors: dietary roughage, feed intake, digestibility, indigenous organisms, Japan, Hokkaido native horses, grasses, feeding behavior.
Language of Text: Japanese.
- Kawai, M., N. Yabu, T. Asa, K. Deguchi, and S. Matsuoka (2005). **Intake, digestibility and rate of passage of grass in grazing by light breed horses on different pastures.** In: *XX International Grassland Congress: Offered Papers, June 26, 2005-July 1, 2005, Dublin, Ireland*, Wageningen Academic Publishers: Wageningen, Netherlands, 515 p. ISBN: 9076998817.
Descriptors: grazing behavior, digestive system, forage intake, passage rate.
- Mackay, L.C., H.F. Mayland, and W.P. Mackay (2003). **Horse preference for alfalfa-grass hay harvested in afternoon or morning.** *Journal of Dairy Science* 86(Suppl. 1): 353. ISSN: 0022-0302.
NAL Call Number: 44.8 J822
Descriptors: horses, roughage, alfalfa grass hay, feeding preference.
Notes: Meeting Information: Joint Annual Meeting of the American Dairy Science Association, the American Society of Animal Science and the Mexican Association of Animal Production, Phoenix, Arizona, USA; June 22-26, 2003.
- Metayer, N., M. Hote, A. Bahr, N.D. Cohen, I. Kim, A.J. Roussel, and V. Julliand (2004). **Meal size and starch content affect gastric emptying in horses.** *Equine Veterinary Journal* 36(5): 436-440. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: management practices, feeding practices, factors contributing to colic, effect of meal size and

composition on gastric emptying, starch content, gastric ulcers.

Moore Colyer, M.J.S., H.J. Morrow, and A.C. Longland (2003). **Mathematical modelling of digesta passage rate, mean retention time and in vivo apparent digestibility of two different lengths of hay and big-bale grass silage in ponies.** *British Journal of Nutrition* 90(1): 109-118. ISSN: 0007-1145.

NAL Call Number: 389.8 B773

Descriptors: digesta passage rate variation measurement, mathematical models, Welsh-cross pony geldings, big-bale grass silage, grass hay, comparison of chopped to unchopped, fecal excretion curves, equine gut.

Muller, C.E. (2005). **Fermentation patterns of small-bale silage and haylage produced as a feed for horses.** *Grass and Forage Science* 60(2): 109-118. ISSN: 0142-5242.

Online: <http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=gfs>

Descriptors: bales, carbon dioxide, chemical composition, dry matter, feeds, haylage, herbage, lactic acid bacteria, organic acids, pH, silage, silage additives, silage fermentation, silage making, storage, horses, *Phleum pratense*.

Naude, T.W., R. Gerber, R.J. Smith, and C.J. Botha (2005). **Datura contamination of hay as the suspected cause of an extensive outbreak of impaction colic in horses.** *Journal of the South African Veterinary Association* 76(2): 107-112. ISSN: 0038-2809.

NAL Call Number: 41.8 SO8

Descriptors: impaction colic, contaminated hay, *Datura* poisoning, digestive system, toxicology, tef hay contamination.

Pearson, R.A., R.F. Archibald, and R.H. Muirhead (2001). **The effect of forage quality and level of feeding on digestibility and gastrointestinal transit time of at straw and alfalfa given to ponies and donkeys.** *British Journal of Nutrition* 85(5): 599-606. ISSN: 0007-1145.

NAL Call Number: 389.8 B773

Abstract: Four donkeys and four ponies were fed molassed dehydrated alfalfa or oat straw, either ad libitum or restricted to about 70% ad libitum intake in a Latin-square design for four periods of 21 d. Measurements of apparent digestibility and gastrointestinal transit time were made on the last 7 d of each period. When the forages were provided ad libitum, all animals ate significantly ($P < 0.01$) more of the alfalfa than of the oat straw. Ponies consumed significantly ($P = 0.007$) more of both diets per unit live weight than donkeys. Higher apparent digestibilities of dietary DM, energy and fibre fractions were seen in donkeys, at both levels of feeding, compared with the ponies. This partly compensated for the lower intakes by the donkeys when fed ad libitum. When intake of alfalfa was restricted, the apparent digestibility of DM was higher compared with the corresponding values when fed ad libitum, but the reverse was true for straw. This may be because restriction of a low-quality diet reduced selection of the more digestible parts of the forage. Donkeys and ponies consumed more energy and protein than required when fed alfalfa ad libitum. Both oat straw treatments provided insufficient protein to meet the predicted requirements of ponies and donkeys. Straw intakes ad libitum exceeded the estimated energy requirement for ponies by 34-51%, but donkey energy requirements were only just met. When the amount of straw offered was restricted, 78-90% of the estimated energy requirement for donkeys was met compared with 90-105% for the ponies.

Descriptors: horse feeding, forage quality, molassed dehydrated alfalfa or oat straw, gastrointestinal transit time, oat straw, alfalfa, feed intake, experimental diets, digestibility, restricted feeding, water intake.

Pinosa, M., B. Stefanon, L.A. Volpelli, and S. Bovolenta (1999). **Stima dell' ingestione di fieno di festuca in cavalli con il metodo degli n-alcani. [Estimation of fescue hay intake in horses using the n-alkanes method].** *Zootecnica e Nutrizione Animale* 25(6): 243-248. ISSN: 0390-0487.

NAL Call Number: SF1.Z6

Descriptors: fescue hay intake, in vivo experimentation, dietary rations, fecal sampling, N-alkanes method, horses.

Language of Text: Italian.

Shingu, Y., S. Kondo, H. Hata, and M. Okubo (2001). **Digestibility and number of bites and chews on hay at fixed**

level in Hokkaido native horses and light half-bred horses. *Journal of Equine Science* 12(4): 145-147. ISSN: 1340-3516.

NAL Call Number: SF277.J37

Descriptors: breed variation, nutrition, feed digestibility, feeding behavior comparison, Hokkaido native horses, light half-bred horses, Japan, timothy hay.

Simonen Jokinen, T., R.S. Pirie, B.C. McGorum, and P. Maisi (2005). **Effect of composition and different fractions of hay dust suspension on inflammation in lungs of heaves-affected horses: MMP-9 and MMP-2 as indicators of tissue destruction.** *Equine Veterinary Journal* 37(5): 412-417. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, horse diseases, respiratory tract diseases, hay, dust emissions, inflammation, synergism, metalloproteinases, biomarkers, particulates, solubility, chemical composition, bronchi, pulmonary alveoli, polyacrylamide gel electrophoresis, lipopolysaccharides, glucans, molds fungi, etiology, pathogenesis, endotoxins, heaves.

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Vitamins and Supplements

Cabrera, L., L. Leclere, and J.L. Tisserand (1997). **Influence of food nitrogen source on levels of plasma free amino acids in ponies.** *Annales De Zootechnie* 46(1): 93-103. ISSN: 0003-424X.

NAL Call Number: 49 F84

Descriptors: horses, Shetland ponies, plasma free amino acids, feeding.

Language of Text: French.

Harris, P.A. and R.C. Harris (2005). **Ergogenic potential of nutritional strategies and substances in the horse.**

Livestock Production Science 92(2): 147-165. ISSN: 0301-6226.

Online: <http://www.sciencedirect.com/science/journal/03016226>

Descriptors: amino acids, carnitine, creatine, performance, racehorses, reviews, horses.

Notes: Special issue: *Adaptability of Sport Horses to Stressful Conditions*. EAAP Publication No. 1/2005.

Heintzsch, A. (1995). *Effekte einer enzymmischung (ae-amylase, xylanase, B-glucanase, pectinase) als futteradditiv auf die preileale verdaulichkeit starkereicher rationen beimn pferd. [Effects of mixed enzyme supplementation (ae-amylase, xylanase, B-glucanase and pectinase) as a feed-additive on the preileal digestibility of ration based on high content of starch on horses]*. Dissertation, Tierarztliche Hochschule: Hannover, Germany. 137 p.

NAL Call Number: DISS F1995101

Descriptors: horses, nutrition, starch content, mixed enzyme supplementation, ae-amylase, xylanase, B-glucanase, pectinase, preileal digestion.

Language of Text: German with an English summary.

Notes: Thesis (doctoral)--Tierarztliche Hochschule Hannover, 1995.

Hintz, H.F. (1997). **Equine nutrition and health: carotene.** *Equine Practice* 19(9): 5, 25. ISSN: 0162-8941.

NAL Call Number: SF951.E62

Descriptors: horses, beta carotene, supplementary feeding, injection.

Hoffman, R.M. (2000). **Recent findings on the role of antioxidant vitamins in horse nutrition.** In: *62nd Cornell Nutrition Conference for Feed Manufacturers Proceedings, October 24, 2000-October 26, 2000, Rochester, N.Y.*, Departments of Poultry Husbandry, Animal Husbandry, and Biochemistry and Nutrition, New York State College of Agriculture, and the Graduate School of Nutrition, Cornell University, in cooperation with the American Feed Manufacturers' Association: Ithaca, New York, USA, p. 1-7.

NAL Call Number: 389.79 C81

Descriptors: oxidation, stress, retinol, beta carotene, vitamin E, immunity, ascorbic acid, horse feeding, oxidative stress.

Kienzle, E., C. Kaden, P.P. Hoppe, and B. Opitz (2003). **Serum beta-carotene and alpha-tocopherol in horses fed beta-carotene via grass-meal or a synthetic beadlet preparation with and without added dietary fat.**

Journal of Animal Physiology and Animal Nutrition 87(3-4): 174-180. ISSN: 0931-2439.

Descriptors: horses, serum response, bioavailability indicators, nutrition, effects of feed sources.

Kirschvink, N., L. Fievez, V. Bougnet, T. Art, G. Degand, N. Smith, D. Marlin, C. Roberts, P. Harris, and P. Lekeux (2002). **Effect of nutritional antioxidant supplementation on systemic and pulmonary antioxidant status, airway inflammation and lung function in heaves-affected horses.** *Equine Veterinary Journal* 34(7): 705-712. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, respiratory diseases, inflammation, antioxidants, lung function, tests, bronchoalveolar lavage, feed supplements, heaves, oxidative stress.

Koch, C.A. (2003). *Heilpflanzen Beim Pferd - Experimentelle Grundlagen Zu Ausgewählten Anwendungsgebieten, Praxisübliche Produktkonzepte Und Futtermittelrechtliche Wertung. [Medicinal Plants for Horses - Experimental Bases on Their Application to Selected Areas - Product Concepts in Practice and Legal Evaluation of Their Use in Animal Food]*, 208 p.

Descriptors: animal health, chemical composition, digestive system, drug therapy, feed additives, immune system, law, medicinal plants, musculoskeletal system, plant composition, plant extracts, prophylaxis, respiratory system, horses.

Language of Text: German with an English summary.

McKenzie, E.C., S.J. Valberg, S.M. Godden, J.D. Pagan, G.P. Carlson, J.M. MacLeay, and F.D. DeLaCorte (2003). **Comparison of volumetric urine collection versus single-sample urine collection in horses consuming diets varying in cation-anion balance.** *American Journal of Veterinary Research* 64(3): 284-291. ISSN: 0002-9645.
NAL Call Number: 41.8 Am3A

Abstract: OBJECTIVE: To determine daily variation in urinary clearance and fractional excretion (FE) of electrolytes and minerals within and between horses and to compare volumetric and single-sample urine collection for determining FE values of diets with a range of dietary cation-anion balance (DCAB). ANIMALS: 5 Thoroughbred and 6 mixed-breed mares. PROCEDURE: 3 isocaloric diets with low, medium, and high DCAB values (85, 190, and 380 mEq/kg of dry matter, respectively) were each fed for 14 days. Daily blood samples, single urine samples collected by using a urinary catheter (5 mares), and volumetric urine collections (6 mares) were obtained during the last 72 hours of each diet. RESULTS: Urine and plasma pH values, plasma concentrations, and FE values of sodium, chloride, potassium, magnesium, phosphorus, and calcium were altered by varying the DCAB. Noticeable variation in clearance and FE values was detected within horses from day-to-day on the same diet as well as between horses. Fractional excretion values were not significantly different between single-sample and volumetric methods, except for magnesium in the high DCAB diet. Volumetric and single-sample collections revealed similar patterns of change in urinary FE values with varying DCAB, except for calcium and magnesium. CONCLUSIONS AND CLINICAL RELEVANCE: Substantial variation in clearance and FE of electrolytes and minerals are evident within horses between 24-hour periods as well as between horses fed a specific diet. Three daily urine samples provide similar information regarding dietary-induced changes in clearance and FE values (excluding calcium and magnesium) as that obtained by volumetric urine collection.

Descriptors: urine collection methods, dietary cation-anion balance, excretion of electrolytes, horse nutrition, determination of fractional excretion of electrolytes and minerals.

O'Neill, W., S. McKee, and A.F. Clarke (2002). **Immunological and haematinic consequences of feeding a standardised *Echinacea* (*Echinacea angustifolia*) extract to healthy horses.** *Equine Veterinary Journal* 34(3): 222-227. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, *Echinacea angustifolia*, plant extracts, immunostimulants, immunostimulation, efficacy, medicinal properties, immune competence, phagocytosis, lymphocytes, neutrophils, erythrocytes, hemoglobin, hematocrit, erythropoiesis.

Suwannachot, P. (2001). *K⁺-homeostasis in horses: Effects of training and food supply on the Na⁺, K⁺-ATPase concentration in skeletal muscle.* Dissertation, Utrecht University: Utrecht, Netherlands. 203 p.

Online: 9039326517

Descriptors: training of horses, food supply, homeostasis, skeletal muscle, supply balance, potassium, effects of training and food supply.

Notes: Thesis.

Zeyner, A. and J. Harmeyer (1999). **Metabolic functions of L-carnitine and its effects as feed additive in horses. A review.** *Archiv Fur Tierernahrung* 52(2): 115-138.

NAL Call Number: TRANSL 22766

Abstract: L-carnitine, a betaine derivative of beta-hydroxybutyrate, is found in virtually all cells of higher animals and also in some microorganisms and plants. In animals it is synthesized almost exclusively in the liver. Two essential amino acids, i.e., lysine and methionine serve as primary substrates for its biosynthesis. Also required for its synthesis are sufficient amounts of vitamin B6, nicotinic acids, vitamin C and folate. The first discovered ergogenic function of L-carnitine is the transfer of activated long-chain fatty acids across the inner mitochondrial membrane into the mitochondrial matrix. For this transfer acyl-CoA esters are transesterified to form acylcarnitine esters. Thus, in carnitine deficiency fat oxidation and energy production from fatty acids are markedly impaired. Skeletal muscles constitute the main reservoir of carnitine in the body and have a carnitine concentration at least 200 times higher than blood plasma. Uptake of carnitine by skeletal muscles takes place by an active transport mechanism which transports L-carnitine into muscles probably in the form of an exchange process with gamma-butyrobetain. In young animals including foals, the capacity for biosynthesis of carnitine is not yet fully developed and apparently cannot meet the requirements of sucking animals. Sucking animals depend therefore on an extra supply of carnitine which is usually provided with milk. Additionally, young animals including foals possess a lower concentration of carnitine in blood plasma than adult animals. Besides its role as carrier of activated acyl groups, L-carnitine functions as a buffer for acetyl groups which may be present in excess in different tissues during ketosis and hypoxic muscular activity. Other functions of L-carnitine are protection of membrane structures, stabilizing of a physiologic CoA-SH/acetyl-CoA ratio and reduction of lactate production. Animal's derived feeds are rich in L-carnitine whereas plants contain usually very little or no carnitine. Carnitine is absorbed from the small intestine by active and passive transport mechanisms. From the increase in renal excretion of L-carnitine after oral supplementations of 10 g/d to horses it has been concluded that the efficiency of absorption of L-carnitine is rather low (about 5 to 10% of the supplied dose). A further decrease in fractional carnitine absorption was observed when the oral dose of carnitine was increased. L-carnitine is virtually not degraded in the body and renal excretion of carnitine is comparatively small under normal conditions. The concentration of L-carnitine in blood plasma of horses varies markedly between animals and between different days. In addition, circadian changes in carnitine concentration in plasma have been reported. Peak concentrations were found during late afternoon, being up to 30% higher than those in the morning. In breeding mares the carnitine concentration in blood plasma declines with onset of lactation. In resting skeletal muscles about 90% of the total carnitine content is present as free carnitine with the remaining part being available as carnitine esters. With increasing exercise intensity a continuing greater proportion of free carnitine (up to 80%) is converted into carnitine esters, mainly into acetylcarnitine. This shift from free to acetylcarnitine is readily reversed within about 30 min after termination of exercise. It appears that acute exercise does not have a marked effect on the content of total carnitine in skeletal muscle whereas training seems to elevate its total concentration in the middle gluteal muscle of 3 to 6 year old horses and to reduce variation of its concentration compared to age-matched untrained horses. Oral supplementations of 5 to 50 g of L-carnitine per day to horses elevated the carnitine concentration in blood plasma to about twice its basal concentration. No clear relationship existed, however, between the orally administered dose of carnitine and the increase of L-carni

Descriptors: animal nutrition, carnitine metabolism, food additives, horses, animal feed, carnitine administration and dosage, physical conditioning, L-carnitine, oral supplementation.

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Pasture

Adamovics, A. (2004). **Zirgu spekam un skaistumam nepieciešamas ganības. [Pastures for power and beauty of horses].** *Agro Tops*(7): 53-55. ISSN: 1407-5164.

Abstract: This article presents requirements for management of quality horse pastures.

Descriptors: pastures, grasslands, horse pasture characteristics, fertilizer application, Latvia.

Language of Text: Latvian.

Anonymous (2004). **Pasture fructan concentration as a cause of equine laminitis.** *Journal of Equine Veterinary Science* 24(12): 542. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: equine foot disease, laminitis, effects of pasture, starch digestion, pasture management practices, grazing management practices, fructans.

Araya, O., R. Urzua, and H. Bustamante (2004). **Efecto del selenato de bario inyectable sobre la actividad de glutatión peroxidasa en caballos a pastoreo. [The effect of injectable barium selenate on the glutathione peroxidase activity of horses on pastures].** *Archivos De Medicina Veterinaria* 36(1): 31-37. ISSN: 0301-732X.

Descriptors: horses, barium selenate, erythrocytic glutathione peroxidase activity, selenium status.

Language of Text: Spanish with an English summary.

Avery, A. (1996). **Pastures for Horses: A Winning Resource**, Rural Industries Research & Development Corporation, Dept. of Natural Resources & Environment Victoria: Victoria, Australia, 198 p. ISBN: 0642259739.

NAL Call Number: SB199.A94 1996

Descriptors: pastures, Australia, horses feeding and feeds.

Bagnola Junior, J., A.F.T. Amarante, and L.F.F. Meyer (1996). **Verminose em equinos: exames parastológicos, contaminação da pastagem e pastejo alternado com ovinos. [Helminthoses of horses: parasitological examination, pasture contamination and alternation of grazing with sheep].** *Veterinaria e Zootecnia* 8: 47-57. ISSN: 0102-5716.

NAL Call Number: SF604.V466

Descriptors: horses, sheep, pastures, parasitic contamination, epidemiology.

Language of Text: Portuguese with an English summary.

Barbosa, O.F., U.F. Rocha, G.S. da Silva, V.E. Soares, V.A. Veronez, G.P. de Oliveira, V.J.C. Landim, and A.J. da Costa (2001). **A survey on Cyathostominae nematodes (Strongylidae, Strongylidae) in pasture bred horses from Sao Paulo State, Brazil.** *Semina: Ciências Agrárias Londrina* 22(1): 21-26. ISSN: 1676-546X.

Online: http://www.uel.br/proppg/semina/pdf/semina_22_1_19_9.pdf

Descriptors: horses, effect of age differences on infection, nematode infection, epidemiology, intestinal contamination.

Language of Text: English with a Portuguese summary.

Benyovovszky, B.M., K. Penksza, and J. Hausenblasz (1998). **Qualitaetsanforderungen der Pferde an die Weide. [Quality requirements of pasture for horses]**. In: *Conference on Nutrition of Domestic Animals "Zadravec Erjavec Days"*, Radenci (Slovenia), Vol. 7, p. 216-223.

Descriptors: horses, pastures, grazing, grasses, quality, palatability, animal feeding, land resources, natural resources, nonrenewable resources, organoleptic properties, quality.

Language of Text: German with English, German and Slovenian summaries.

Benyovszky, B.M. and K. Penksza (2002). **A N-mutragyazas optimalis szintje a kedveltseg szempontjabol egy isaszegi lolegelon. [Optimal level of N fertilization considering feeding preference in a horse paddock]**. *Novenytermeles* 51(5): 509-512. ISSN: 0546-8191.

Descriptors: horses, controlled grazing, grasslands, *Bromus inermis*, *Festuca rubra*, *Poa pratensis*, *Bromus*, Equidae, feeding systems, *Festuca*, grazing systems, land cover, mammals, Perissodactyla, *Poa*, Poaceae, vegetation.

Language of Text: Hungarian with English and Hungarian summaries.

Bikbulatov, Z.G., B. Satyev Kh, and V.I. Samokhvalov (1997). **[All-year-round maintenance of horses on pastures]**. *Kormoproizvodstvo*(3): 24-26. ISSN: 0235-2540.

NAL Call Number: SB193.A1L8

Descriptors: horses, pasture management, pasture yield improvement.

Language of Text: Russian.

Brown Douglas, C.G., T.J. Parkinson, E.C. Firth, and P.F. Fennessy (2005). **Bodyweights and growth rates of spring- and autumn-born Thoroughbred horses raised on pasture**. *New Zealand Veterinary Journal* 53(5): 326-331. ISSN: 0048-0169.

Descriptors: autumn, body weight, foaling, growth rate, pastures, racehorses, spring, Thoroughbred, horses.

Burger, S.M. (1996). *Horse Owner's Field Guide to Toxic Plants*, Breakthrough: Ossining, New York, USA, 230 p. ISBN: 0914327623.

NAL Call Number: SB617.4.B97 1996

Descriptors: poisonous plants, identification, toxicology, horses health, United States, geographical distribution.

Capewell, L.G., D. Hunt, J. Guerrero, K. Newcomb, and T. Root (2005). **The prevalence of strongyles in stabled and pastured horses in Vermont and efficacy of anthelmintic programs in these horses**. *International Journal of Applied Research in Veterinary Medicine* 3(3): 227-232. ISSN: 1542-2666.

Online: www.jarvm.com

Descriptors: anthelmintics, disease control, disease prevalence, fenbendazole, ivermectin, pastures, potency, stables, horses, Strongylidae.

Carnevale, E.M., M.J. Hermetet, and O.J. Ginther (1997). **Age and pasture effects on vernal transition in mares**. *Theriogenology* 47(5): 1009-1018. ISSN: 0093-691X.

Descriptors: mares, follicular activity, vernal transition, age, pasture, ovulation.

Coletto, L. (1999). **Equine babesiosis: A disease linked to the extensive horse raising in the pasture land of Extremadura ("dehesa")**. *Cahiers Options Mediterraneennes* 39: 273-276. ISSN: 1022-1379.

Abstract: Serologic testing was carried out to show antibodies to *Babesia equi* and *Babesia caballi* in mares raised in extensive regime in the "dehesa" of Extremadura, their transmission to the mares' offspring and their permanence in the foals. We have studied 33 Andalusian mare and foal serums. The technique used has been that of indirect immunofluorescence (IFI). The result is 63.6 per cent of the mares and 54.5 per cent of the foals seropositive to *B. equi*. All serums were negative to *B. caballi*.

Descriptors: *Babesia equi*, immunofluorescence, spain, *Babesia*, Europe, immunological techniques, piroplasma, protozoa, southern Europe, sporozoa, western Europe.

Language of Text: English and French summaries.

Notes: Meeting Information: Meeting of the Mediterranean Sub Network of the FAO CIHEAM Inter Regional

Cooperative Research and Development Network on Pastures and Fodder Crops. Badajoz (Spain). 26-29 Nov 1997.

Craig, S. (1997). **Pasture management, indigenous veterinary care and the role of the horse in Mustang, Nepal.** In: *Rangelands and Pastoral Development in the Hindu Kush Himalayas: Proceedings of a Regional Experts' Meeting, November 5, 1996-November 7, 1996, Kathmandu, Nepal*, International Centre for Integrated Mountain Development (ICIMOD): Kathmandu, Nepal, p. 147-170.

Descriptors: horses, pasture management, grazing technique, indigenous veterinary practice.

Crane, K., M. Smith, and D. Reynolds (1995). **Horse pasture.** *Wyoming Wildlife* 59(3): 32-35. ISSN: 0043-9819.

Descriptors: horses, grazing, pasture.

Cubitt, T.A., W.B. Staniar, D.S. Kronfeld, B.M. Byrd, and P.A. Harris (2005). **Environmental effects on nutritive value of equine pastures.** *Pferdeheilkunde* 21: 13-14. ISSN: 0177-7726.

Descriptors: carbohydrates, chemical composition, crude protein, energy content, environmental factors, fiber content, nutritive value, pastures, plant composition, protein content, temperature, Equidae, *Festuca arundinacea*, *Poa pratensis*, *Trifolium repens*.

Notes: Meeting Information: Proceedings Equine Nutrition Conference, Hannover, Germany, 1-2 October, 2005.

Dorchies, P. (1995). **Le point sur le parasitisme du cheval au paturage. [Parasitoses of horses at pasture].** In: *Journee de la Recherche Equine, March 1, 1995*, Institut du Cheval: Paris, France, Vol. 21, p. 78-81. ISBN: 2910610055.

Descriptors: horses, parasites, helminthoses, parasitology, anthelmintics, pasture.

Language of Text: French with an English summary.

Dvojnjos, G., L. Balachov, and N. Samzuk (1999). **[Wild horses in grazing management of pastures in Chernobyl exclusion zone (in Polesje)].** *Vestnik Zoologii Supplement* 11: 67-71.

Descriptors: horses, grazing, pasture management.

Language of Text: Russian.

Fisher, C. (1995). **Horse care: perilous pasture plants.** *Rural Heritage* 20(2): 44-45. ISSN: 0889-2970.

NAL Call Number: SF311.E9

Descriptors: horses, poisonous plants, poisoning, *Sorghum sudanense*, *Euphorbia esula*, *Equisetum arvense*, *Trifolium hybridum*, *Pteridium aquilinum*, *Hypericum perforatum*, *Glechoma hederacea*, *Prunus serotina*, *Kalmia latifolia*, *Solanum dulcamara*, *Rhododendron maximum*, North America.

Fleurance, G., P. Duncan, and C. Menard (2000). **Utilisation heterogene d'une prairie par des chevaux: Relations avec les caracteristiques de la vegetation et l'etat d'infestation parasitaire de la pature. [Heterogeneous use of a prairie by horses: Relations between the vegetation characteristics and the parasitic infestation of the pasture].** In: *Journee de la Recherche Equine, March 1, 2000*, Les Haras Nationaux Direction Du Developpement: Paris, France, Vol. 26, p. 153-165.

NAL Call Number:

Descriptors: grazing behavior, grass height and variety, grass intake, feeding preference, selective feeding, preference for shorter grasses, reduction of parasitic infestation, Mulassier Poitevan mares, wet grassland.

Language of Text: French with an English summary.

Gallagher, J.R. (1996). **The potential of pasture to supply the nutritional requirements of grazing horses.**

Australian Veterinary Journal 73(2): 67-68. ISSN: 0005-0423.

NAL Call Number: 41.8 Au72

Descriptors: horses, grazing, nutritional state, pastures, irrigated pastures, feeding preferences, seasonal variation, grazing behavior, horse diseases, nutritive value, literature reviews, Australia, dryland pastures.

Gallagher, J.R. and T.G. Reeves (1996). **Selenium and copper intakes of oat/vetch pasture grazed by horses.**

Journal of Animal Science 74(Suppl. 1): 183. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, nutrition, selenium, copper, oat, vetch pasture grazing.

Notes: Meeting Information: 88th Annual Meeting of the American Society of Animal Science, Rapid City, South Dakota, USA; July 24-26, 1996.

Gee, E.K., E.C. Firth, P.C.H. Morel, P.F. Fennessy, N.D. Grace, and T.D. Mogg (2005). **Enlargements of the distal third metacarpus and metatarsus in Thoroughbred foals at pasture from birth to 160 days of age.** *New Zealand Veterinary Journal* 53(6): 438-447. ISSN: 0048-0169.

Descriptors: autumn, bone diseases, foals, metacarpus, metatarsus, postnatal development, racehorses, radiography, seasonal variation, summer, Thoroughbred, horses.

Gee, E.K., P.C.H. Morel, T.D. Mogg, E.C. Firth, N.D. Grace, and P.F. Fennessy (2004). **Liver copper kinetics in Thoroughbred foals at pasture from birth to 160 days of age.** *New Zealand Journal of Agricultural Research* 47(2): 109-118. ISSN: 0028-8233.

NAL Call Number: 23 N4892

Descriptors: horses, mares, pregnancy, copper intake, copper deficiency, orthopedic disease, copper supplementation, copper injection.

Giessen Univ. (Germany). Inst. fuer Tierzucht und Haustiergenetik. (1996). **Pferdeweide - Know-how. [Horse pastures - Know-how].** *Reiterjournal (Germany)* 17(2): 85-86. ISSN: 0173-2404.

Descriptors: pastures, horses, maintenance, fertilizer application, weed control, grazing systems, pasture improvement, feeding systems, grassland management, grazing lands, land resources, natural resources, pest control.

Language of Text: German.

Grace, N. (2005). **Pasture counts: The contribution of pasture to the diets of horses.** In: J.D. Pagan (Editor), *Advances in Equine Nutrition III*, Nottingham University Press: Nottingham, UK, p. 11-21. ISBN: 1904761283.

NAL Call Number: SF285.5.A39 2005

Descriptors: pasture productivity, frequently grazed pastures, disease resistant pasture species, pasture production factors, pasture utilization by horses, dry matter intakes (DMI), digestible energy intakes (DEI), Thoroughbreds, growth and development of young horses.

Grace, N.D., S.G. Pearce, E.C. Firth, and P.F. Fennessy (1999). **Concentrations of macro- and micro-elements in the milk of pasture-fed Thoroughbred mares.** *Australian Veterinary Journal* 77(3): 177-180. ISSN: 0005-0423.

NAL Call Number: 41.8 Au72

Descriptors: horses, lactating mares, Thoroughbreds, foals, nutrition, pasture feeding, macroelement concentration, microelement concentration, dietary mineral requirements.

Grace, N.D., H.L. Shaw, E.K. Gee, and E.C. Firth (2002). **Determination of the digestible energy intake and apparent absorption of macroelements in pasture-fed lactating Thoroughbred mares.** *New Zealand Veterinary Journal* 50(5): 182-185. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Descriptors: horses, lactating mares, nutritional value of pasture, digestible energy intake, dry matter digestibility, macroelement absorption.

Hamet, N., E. Doligez, C. Cazier, F. Chansard, C. Nizet, and C. Collobert (2000). **Definition de messages techniques coherents concernant le paturage des chevaux et la prevention du parasitisme. I. Relation entre la gestion des zones paturees et la contamination de l'herbe et des animaux. [Defining the technical advice concerning the pasturage of horses and the prevention of parasites. 1. Relationship between grazing zones of pastures and contamination of the herbage and animals].** In: *Journee de la Recherche Equine, March 1, 2000*, Les Haras Nationaux Direction du Developpement: Vol. 26, p. 45-53.

Descriptors: pasture management, stud farms, relationship between pasture management practices and internal parasites, brood mares, foals, nutrition, disease prevention, parasite prevention.

Language of Text: French with an English summary.

Harris, P., S.R. Bailey, J. Elliott, and A. Longland (2006). **Countermeasures for pasture-associated laminitis in ponies and horses.** *Journal of Nutrition* 136(7 Suppl.): 2114s-2121s.

Abstract: Laminitis occurs throughout the world in horses and ponies and has major welfare implications. It is obviously important to be able to recognize and treat the condition in its early stages so that pain and suffering are kept to a minimum. However, ideally it would be preferred to be able to recommend certain interventions/countermeasures that avoid or prevent the condition from occurring in the first place. Because pasture-associated laminitis occurs with grass consumption, one obvious way to avoid the condition is to prevent access to pasture and to feed forage alternatives that are known to be low in rapidly fermentable material. For the majority of horses, total restriction is not always a viable or desired option for financial, welfare, and health reasons. It also may not be necessary for those animals that are not predisposed to laminitis. This review discusses the possible countermeasures that could be considered now and in the future in the following 7 key areas: 1) Identifying animals predisposed to the condition; 2) Limiting development of insulin resistance; 3) Avoiding high intakes of rapidly fermentable material; 4) Preventing/reducing the formation and absorption of the various "triggering factors"; 5) Reducing/preventing oxidative damage; 6) Preventing/reducing matrix metalloproteinase activity; and 7) Preventing changes in blood flow. It is unfortunate that little or no hard data exist at present on effective countermeasures, only mechanistic evidence for avoiding risk factors. However, there is much to gain, and research in this area is urgently required.

Descriptors: laminitis prevention, genetic predisposition identification, equine nutrition, insulin resistance, fermentation, oxidative damage, metalloproteinase activity, blood flow, risk factors, equine welfare.

Hoffman, R.M. (2000). **Optimal nutrition and supplementation of horses on pasture.** In: *62nd Cornell Nutrition Conference for Feed Manufacturers Proceedings, October 24, 2000-October 26, 2000, Rochester, New York*, Departments of Poultry Husbandry, Animal Husbandry, and Biochemistry and Nutrition, New York State College of Agriculture, and the Graduate School of Nutrition, Cornell University, in cooperation with the American Feed Manufacturers' Association: Ithaca, New York, USA, p. 89-99.

NAL Call Number: 389.79 C81

Descriptors: horse feeding, diet, mineral supplements, nutrient requirements, grazing, feed intake, nutrient content, vitamin supplements, protein supplements, dietary carbohydrate, dietary fat, growth, bones, milk composition, blood sugar, feed supplements, nutrition physiology, product development.

Hoffman, R.M., J.A. Wilson, D.S. Kronfeld, W.L. Cooper, L.A. Lawrence, D. Sklan, and P.A. Harris (2001).

Hydrolyzable carbohydrates in pasture, hay, and horse feeds: direct assay and seasonal variation. *Journal of Animal Science* 79(2): 500-506. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: feed, nutrition, hydrolyzable carbohydrates, forages, concentrates, nonstructural carbohydrate, hydrolyzable carbohydrate concentration, near-infrared spectrum, seasonal variation, rapidly fermentable carbohydrates, laminitis, colic.

Hoskin, S.O. and E.K. Gee (2004). **Feeding value of pastures for horses.** *New Zealand Veterinary Journal* 52(6): 332-341. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Abstract: The feeding value of fresh pasture grazed in situ is determined by animal performance or productivity and could be relatively easily established for growing and lactating horses. Despite this, there is a lack of published information on the relative feeding value of different pastures and forages grazed by horses in New Zealand and the world. In addition, for adult breeding or non-breeding and young or adult sport or performance horses, the definition of feeding value and its determination remain problematic. Limited information suggests that the feeding value of perennial ryegrass-based pasture in New Zealand for young growing horses is high, and growth rates for Thoroughbred horses fed solely on pasture in New Zealand are similar to those reported from the Northern Hemisphere where grain-based supplements are fed in addition to pasture or other forages. Attempts to assess the ability of fresh pastures to meet the nutrient requirements of horses are hampered by problems associated with determination of feed intake by grazing horses and lack of knowledge of the digestibility and utilisation of digested nutrients, including the relative bioavailability of macro- and micro-

minerals in pasture. A further challenge for future research is to determine the effect of herbage allowance and grazing behaviour, including pasture species preferences, on voluntary feed intake by grazing horses. Grazing pasture has benefits for equine health and well-being including reduced risk of some nutrition-related disorders and reduced prevalence of stereotypic behaviour. Pastured horses have greater freedom for expression of natural behaviours including social interaction and exercise. However, grazing pasture is also associated with animal health problems, particularly parasitism and diseases related to pasture-associated toxins.

Descriptors: horses, growth, lactation, feed value, performance, productivity, grazing pasture, forages, parasites.

Hoveland, C.S. (2004). **New forages for horse pastures.** In: *Proceedings American Forage and Grassland Council, June 12, 2004-June 16, 2004, Roanoke, Virginia*, Vol. 13, p. 193-197.

NAL Call Number: SB193.F59

Descriptors: horses, pastures, pasture plants, forage, grazing.

Huang, Y. (2000). **[Mineral elements in pastures and blood of Hequ horse].** *Acta Prataculturae Sinica* 9(3): 32-35. ISSN: 1004-5759.

NAL Call Number: SB202.C6T73

Descriptors: horses, nutrition, forage species, mineral content, *Kobresia bellardii*, *Poa alpigena*, *Elymus nutans*, *Festuca ovina*, *Scirpus distigmaticus*, *Carex scabriostriis*, *Leontopodium nanum*, *Taraxacum mongolicum*.

Language of Text: Chinese with an English summary.

Hunt, W.F. (1997). **Research on foal growth under various pasture conditions.** *Proceedings of the Annual Seminar of the Equine Branch of the New Zealand Veterinary Association (NZVA)* 174: 27-35. ISSN: 0112-9643.

NAL Call Number: SF604.P82

Descriptors: foals, grazing, nutrition, skeletal growth, weight gain, high-endophyte ryegrass, chicory, Tama ryegrass, *Lolium multiflorum* cv. *Tama*, measurement techniques.

Ince, J.C., A.C. Longland, M. Moore Colyer, C.J. Newbold, C. Drakley, and P. Harris (2005). **A pilot study to estimate the intake of grass by ponies with restricted access to pasture.** In: *Proceedings of the British Society of Animal Science Annual Conference, April 4, 2005-April 6, 2005, York, UK*, British Society of Animal Science: Penicuik, United Kingdom, p. 109. ISBN: 0906562473.

NAL Call Number:

Descriptors: grass intake, weight gain, pasture management and production, feeding restriction, pilot studies, access to pasture, ponies.

Kapron, B. and B. Nowakowicz Debek (2003). **Effect of winter weight gains on pasture grass intake capacity of saddle breed foals aged 12-18 months.** *Annals of Animal Science* 3(1): 47-54. ISSN: 1642-3402.

NAL Call Number: SF1.A66

Descriptors: horses, foals, weight gain, seasonality, feed intake, compensatory growth, concentrate, digestive system, development, pasture.

Language of Text: English with an Polish summary.

Kawai, M. (2001). **[Intake and digestibility in Hokkaido native horses on woodland pasture].** *Journal of Japanese Society of Grassland Science* 47(2): 204-211. ISSN: 0447-5933.

NAL Call Number: 60.9 J27

Descriptors: horses, pasture, grazing, feed intake, feed digestibility.

Language of Text: Japanese.

Kawai, M., H. Inaba, S. Kondo, H. Hata, and M. Okubo (1999). **Comparison of intake, digestibility and nutritive value of *Sasa nipponica* in Hokkaido [Japan] native horses on summer and winter woodland pasture.** *Journal of Japanese Society of Grassland Science* 45(1): 15-19. ISSN: 0447-5933.

NAL Call Number: 60.9 J27

Abstract: Amount or intake, digestibility and nutritive value of sasa (*Sasa nipponica*) foliage in Hokkaido native horses were determined on woodland by the double-indicator method and compared among seasons, i.e. summer, non-snowy periods in winter and snowy periods in winter. The total number of mares and fillies used

for experiment were 9 and 3 in summer, 4 and 9 during non-snowy periods in winter and 4 and 6 during snowy periods in winter. The dry matter intake of *Sasa nipponica* foliage was significantly higher in summer and during non-snowy periods in winter than that during snowy periods in winter ($P < 0.05$). The apparent digestibility of NDF in winter was lower than that in summer ($P < 0.05$). The contents of DCP and DE were 9.2% DM and 1.73 Mcal/kgDM in winter, and were similar to those in summer. The DCP intake of mares and fillies were more than the maintenance requirements (NRC, 1989) of the horses in all seasons. The DE intake of mares was found to be less than the maintenance requirement of the horses during snowy periods in winter, resulting into their body weight losses during this experimental periods. The DE intake of fillies were more than maintenance requirement in all seasons, while their body weight increased in summer and during non-snowy periods in winter, and maintained during snowy periods in winter.

Descriptors: *Sasa nipponica*, nutritive value of sasa, Hokkaido native horses, Japan, seasonal comparison, body weights, feeding habits of horses.

Language of Text: English and Japanese summaries.

Kawai, M., N. Yabu, T. Asa, K. Deguchi, and S. Matsuoka (2005). **Intake, digestibility and rate of passage of grass in grazing by light breed horses on different pastures.** In: *XX International Grassland Congress: Offered Papers, June 26, 2005-July 1, 2005, Dublin, Ireland*, Wageningen Academic Publishers: Wageningen, Netherlands, 515 p. ISBN: 9076998817.

Descriptors: grazing behavior, digestive system, forage intake, passage rate.

Kronfeld, D.S. (1997). **Variations in energy requirements of horses and errors in estimation of pasture intake.** In: *Proceedings of the 15th Equine Nutrition and Physiology Symposium, May 28, 1997-May 31, 1997, Fort Worth, Texas, USA*, Savoy, USA: Equine Nutrition & Physiology Society Publications, p. 383.

Descriptors: horses, energy requirement, pasture intake.

Kronfeld, D.S., K.H. Treiber, T.M. Hess, R.K. Splan, B.M. Byrd, W.B. Staniar, and N.W. White (2006). **Metabolic syndrome in healthy ponies facilitates nutritional countermeasures against pasture laminitis.** *Journal of Nutrition* 136(7 Suppl.): 2090s-2093s.

Descriptors: laminitis prevention, predisposition identification, pedigree analysis, equine nutrition.

Kurvers, C.M., P.R. van Weeren, C.W. Rogers, and M.C. van Dierendonck (2006). **Quantification of spontaneous locomotion activity in foals kept in pastures under various management conditions.** *American Journal of Veterinary Research* 67(7): 1212-1217.

Abstract: Objective-To describe spontaneous locomotion activity of foals kept under various management conditions and assess the suitability of global positioning system (GPS) technology for recording foal activity. Animals-59 foals. Procedures-During the foals' first 4 months of life, 921 observation periods (15 minutes each) were collected and analyzed for locomotion activities. The GPS system was evaluated by simultaneously carrying out field observations with a handheld computer. Results-Foals spent 0.5% of total observed time cantering, 0.2% trotting, 10.7% walking, 32.0% grazing, 34.8% standing, and 21.6% lying down. Total observed daytime workload (velocity x distance) in the first month was approximately twice that in the following months. Locomotion activity decreased with increasing age. Colts had more activity than fillies in certain periods, and foals that were stabled for some portion of the day had compensatory locomotion activity, which was probably insufficient to reach the level of foals kept continually outside. The GPS recordings and handheld-computer observations were strongly correlated for canter, trot, and walk and moderately correlated for standing and lying. Correlation for grazing was low. Conclusions and Clinical Relevance-Results indicated that domestically managed foals, when kept 24 h/d at pasture, will exercise at a level comparable with feral foals. High workload during the first month of life might be important for conditioning the musculoskeletal system. The GPS technique accurately quantified canter, trot, and walk activities; less accurately indexed resting; and was unsuitable for grazing because of the wide array of velocities used while foraging.

Descriptors: foals, management practices, global positioning system, activity recording methods, daytime workload.

Longland, A.C. and B.M. Byrd (2006). **Pasture nonstructural carbohydrates and equine laminitis.** *Journal of Nutrition* 136(7 Suppl.): 2099s-2102s.

Abstract: Fresh forages constitute a majority of the diet for many horses and ponies that graze on pastures during the growing season in many parts of the world. Grasses generally predominate in such pastures, with varying proportions of legumes. Nonstructural carbohydrates (NSC) (simple sugars, starch, and fructan) can induce laminitis experimentally, and NSC can accumulate to >400 g/kg of dry matter (DM) in pasture grasses. In this article we discuss the environmental factors affecting NSC accumulation in pastures and estimate the potential daily intakes of pasture NSC by grazing horses. We also discuss strategies for both reducing the NSC content of pastures and management practices that can help reduce intakes of pasture NSC by equines at risk of developing laminitis. This study reveals the importance of accurate forage analysis in the development of feeding regimens for equines at risk of laminitis.

Descriptors: diet composition, grasses, dry matter, forage analysis, nonstructural carbohydrates, administration of dietary carbohydrates, dosage of dietary carbohydrates, laminitis.

Mage, C. (1996). **Epidemiologie parasitaire chez les juments de trait au paturage (Strongles). [Parasitic epidemiology of draft mares kept on pasture (Strongyles)].** *Revue De Medecine Veterinaire* 147(3): 211-214. ISSN: 0035-1555.

NAL Call Number: 41.8 R32

Descriptors: mares, draft horses, grazing, pastures, biological contamination, Strongyles, *Strongylus vulgaris*, parasitic infection.

Language of Text: French with English and French summaries.

Mage, C., C. Trillaud Geyl, and G. Arnaud (1995). **Epidemiologie de l'infestation des jeunes chevaux au paturage par les strongles gastro-intestinaux. [Epidemiology of gastrointestinal strongyle infection in young horses on pasture].** *Revue De Medecine Veterinaire* 146(1): 41-44.

Descriptors: horses, epidemiological studies, parasitology, pasture contamination.

Language of Text: French with an English summary.

Mair, T.S. (1996). **Obstructive pulmonary disease in 18 horses at summer pasture.** *The Veterinary Record* 138(4): 89-91. ISSN: 0042-4900.

NAL Call Number: 41.8 V641

Descriptors: horses, summer, animal diseases, grazing, seasons, drug therapy, respiratory disorders, endoscopy, inflammation, granulocytes, clenbuterol, prednisolone, respiratory diseases, hypersensitivity, adrenal cortex hormones, agricultural chemicals, animal feeding, behavior, blood, blood cells, cells, corticoids, disease control, disorders, feeding habits, functional disorders, glucocorticoids, hormones, immunological diseases, leukocytes, organic diseases, seasons, therapy, dyspnoea, neutrophils, obstructive pulmonary disease.

Manteaux, J.P., N. Manteaux, and C. Casset (1996). **Prairies paturees par des chevaux pur-sang en Normandie: composition minerale des zones surpaturees. [Pastures grazed by Thoroughbred horses in Normandy: mineral composition of overgrazed areas].** *Fourrages*(146): 149-164. ISSN: 0429-2766.

Descriptors: horses, overgrazing, pasture composition, pasture mineral composition, legumes.

Language of Text: French with an English summary.

McCluskey, B., J. Traub Dargatz, L. Garber, and F. Ross (1999). **Survey of endophyte infection and its associated toxin in pastures grazed by horses.** In: *Proceedings of the 45th Annual Convention of the American Association of Equine Practitioners, December 5, 1999-December 8, 1999, Albuquerque, New Mexico*, p. 213-216.

Descriptors: horses, tall fescue grass, grazing, pasture, *Neotyphodium coenophialum*, toxins, endophytes, literature reviews, surveys.

McGorum, B.C., I.G. Mayhew, H. Amory, P. Deprez, L. Gillies, K. Green, T.S. Mair, H. Nollet, I.D. Wijnberg, and C.N. Hahn (2006). **Horses on pasture may be affected by equine motor neuron disease.** *Equine Veterinary Journal* 38(1): 47-51.

NAL Call Number: SF955.E6

Abstract: REASONS FOR PERFORMING STUDY: Equine motor neuron disease (EMND) was diagnosed in 3 horses maintained on lush, grass-based pasture. This contrasted with North American studies which identified

limited or no access to green herbage as an important risk factor for EMND. **HYPOTHESIS:** Grazing horses that have an apparently adequate intake of pasture herbage to meet normal equine vitamin E requirements can develop EMND. **METHODS:** Owners of 32 European horses diagnosed with EMND completed a questionnaire regarding intrinsic, managemental, nutritional and environmental factors that could potentially be risk factors for EMND, and also regarding clinical signs, treatments and case outcome. Plasma/serum vitamin E data for these horses were supplied by the veterinarians. No control population was studied. **RESULTS:** Thirteen of 32 horses (termed the 'grazing' group) had part- or full-time access to grass-based pasture at the onset of EMND (median duration at pasture 12 h/day, range 3-24 h). Five of these horses were at pasture for at least 235 h/day at the onset of EMND, 2 of which were at pasture for at least 23.5 h/day throughout the year. Despite grazing, all these horses had a low vitamin E status. The remaining 19 horses resembled those cases reported from North America, in that they had no or limited access to pasture. **CONCLUSIONS AND POTENTIAL RELEVANCE:** A diagnosis of EMND should not be discounted on the basis that a horse has access, even full-time, to lush grass-based pasture. Inadequate vitamin E intake was probably not the sole cause of either the EMND or the low vitamin E status in the grazing horses; the latter was probably the result of abnormal bioavailability or excessive utilisation of vitamin E.

Descriptors: equine motor neuron disease, pasture effects, risk factors, vitamin E requirements, pasture access.

Medica, D.L., M.J. Hanaway, S.L. Ralston, and M.V.K. Sukhdeo (1996). **Grazing behavior of horses on pasture: predisposition to strongylid infection?** *Journal of Equine Veterinary Science* 16(10): 421-427. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, pasture, grazing, behavior, *Strongylus vulgaris*, parasite predisposition.

Mejdell, C.M. and K.E. Boe (2005). **Responses to climatic variables of horses housed outdoors under Nordic winter conditions.** *Canadian Journal of Animal Science* 85(3): 301-308. ISSN: 0008-3984.

NAL Call Number: 41.8 C163

Descriptors: horses, cold zones, cold stress, winter hardiness, animal behavior, air temperature, snow, rain, wind, body condition, thyroid hormones, blood serum, hairs, animal housing, horse breeds, Norway, shivering, Icelandic pony horse breed.

Language of Text: English with a French summary.

Meldrum, B. (2004). **Recognizing poisonous plants and poisonous plant diseases in the horse. "Do you know what is in your pasture?"**. In: *Proceedings American Forage and Grassland Council, June 12, 2004-June 16, 2004, Roanoke, Virginia*, Vol. 13, p. 186-192.

NAL Call Number: SB193.F59

Descriptors: horses, pasture plants, poisonous plants, poisoning.

Mesochina, P., J.L. Peyraud, P. Duncan, D. Micol, and C. Trillaud Geyl (2000). **Ingestion d'herbe au paturage par le cheval de selle en croissance: effet de l'age des poulains et de la biomasse d'herbe. [Grass intake by growing horses at pasture: a test of the effects of the horses' age and sward biomass].** *Annales De Zootechnie* 49(6): 505-515. ISSN: 0003-424X.

NAL Call Number: 49 F84

Descriptors: horses, age variation, nutrition, pasture intake, grazing preference, *Medicago sativa*, *Dactylis glomerata*, *Lolium perenne*, *Trifolium repens*, *Taraxacum officinale*, *Poa pratensis*.

Language of Text: French with an English summary.

Moulin, C. (2000). **Comment aborder le conseil sur le paturage en productions equines? Les enseignements techniques et methodologiques de travaux sur le fonctionnement des systemes d'alimentation. [How does one approach pasture production for horses? The effect of acquired techniques and methods on digestive tract function].** In: *Journee de la Recherche Equine, March 1, 2000*, Les Haras Nationaux Direction Du Developpement: Paris, France, Vol. 26, p. 65-77.

Descriptors: horses, grazing, feeding systems, pasture management, adequate nutrition, pasture diversity, surveys.

Language of Text: French with an English summary.

Orth, D., P. Carrere, A. Lefevre, P. Duquet, Y. Michelin, E. Josien, and G. L'Homme (1997). **L'adjonction de chevaux aux bovins en conditions de sous-chargement modifie-t-elle l'utilisation de la ressource herbagere? [Does the association of horses with cattle under under-stocked grazing conditions modify the utilization of the pasture resource?]**. *Fourrages* ISSN: 0429-2766.

Descriptors: natural pastures, rangelands, highlands, stocking density, grazing intensity, mixed grazing, cattle, horses, feeding habits, Auvergne, behavior, Bovidae, Bovinae, domestic animals, Europe, feeding systems, France, grassland management, grazing systems, land resources, livestock, livestock management, natural resources, nonrenewable resources, pasture, physiographic features, ruminants, useful animals, western Europe.

Language of Text: French with English and French summaries.

Pearce, S.G., E.C. Firth, N.D. Grace, and P.F. Fennessy (1999). **The effect of high pasture molybdenum concentrations on the copper status of grazing horses in New Zealand.** *New Zealand Journal of Agricultural Research* 42(1): 93-99. ISSN: 0028-8233.

NAL Call Number: 23 N4892

Descriptors: horses, nutrition, pasture content, mineral levels.

Pirkelmann, H. (1997). **Ohne Weide und Auslauf geht es nicht. Fuer Jungpferde kommt nur die Gruppenhaltung im Laufstall in Frage. [Without pasture and free range nothing works. For young horses only group housing in a loose housing system is possible].** *Wuerttemberg Agricultural Weekly* 164(8): 16-18, 20. ISSN: 0043-9606.

NAL Call Number: 18 W96

Descriptors: mares, foals, animal housing, design, free range husbandry, animal welfare, loose housing system, young horse needs, pastures, farming systems, grazing lands.

Language of Text: German.

Rogers, C.W., B. Eastwood, E.K. Gee, and E.C. Firth (2004). **The effect of grain supplementation on the faecal pH of horses maintained on pasture.** *Proceedings of the New Zealand Society of Animal Production* 64: 165-170. ISSN: 0370-2731.

NAL Call Number: 49.9 N483

Descriptors: horses, nutrition, pasture, grazing, fecal pH, grain supplementation.

Romaniuk, K., R. Szyborska, J. Kal, and a. Karpinska (2005). **Wystepowanie muchowek u krow i konikow polskich przebywajacych na pastwisku. [Outbreaks of diptera in cows and primitive Polish horses maintained in pastures].** *Medycyna Weterynaryjna* 61(3): 332-334. ISSN: 0025-8628.

Descriptors: pasture management, pest control, fly prevalence, effect of climate on fly population.

Language of Text: Polish.

Ryan, P., B. Rude, B. Warren, L. Boyd, D. Lang, D. Scruggs, and R. Hopper (2001). **Effects of exposing late-term pregnant mares to toxic and non-toxic endophyte-infected tall *Fescue* pastures.** *Biology of Reproduction* 64(Suppl. 1): 346-347. ISSN: 0006-3363.

NAL Call Number: QL876.B5

Descriptors: horses, pregnant mares, reproduction, pastures, endophytes, tall *Fescue* plants, toxicology.

Notes: Meeting Information: Thirty-fourth Annual Meeting of the Society for the Study of Reproduction, Ottawa, Ontario, Canada; July 28-August 01, 2001.

Seki, Y., Y.M. Seimiya, G. Yaegashi, S. Kumagai, H. Sentsui, T. Nishimori, and R. Ishihara (2004). **Occurrence of equine coital exanthema in pastured draft horses and isolation of equine herpesvirus 3 from progenital lesions.** *Journal of Veterinary Medical Science* 66(12): 1503-1508. ISSN: 0916-7250.

Descriptors: antibodies, artificial insemination, clinical aspects, copulation, disease prevalence, disease prevention, epidemics, epidemiology, exanthema, genes, mares, stallions, viral proteins, virus neutralization, equine herpesvirus, horses.

Singer, J.W., W.J. Bamka, D. Kluchinski, and R. Govindasamy (2002). **Using the recommended stocking density to predict equine pasture management.** *Journal of Equine Veterinary Science* 22(2): 73-76. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, pasture management, maintenance procedures.

Singer, J.W., N. Bobsin, W.J. Bamka, and D. Kluchinshi (1999). **Horse pasture management.** *Journal of Equine Veterinary Science* 19(9): 540-592. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, pasture management, maintenance procedures, forage species, stocking rates, fertilization, nutrition.

Singer, J.W., D. Kluchinski, W.J. Bamka, N. Bobsin, and R. Govindasamy (2002). **Effectiveness of cooperative extension equine pasture management programs.** *Journal of Natural Resources and Life Sciences Education* 31: 59-61. ISSN: 1059-9053.

NAL Call Number: S530.J6

Descriptors: horse pastures, cooperative extension services, surveys.

Swerczek, T.W. (2002). **Saprotrophic fungi and bacteria and commensal bacteria that infect frost-damaged pastures may be contributing to gut microbial overgrowth and lesions associated with the mare reproductive loss syndrome.** *Journal of Equine Veterinary Science* 22(6): 234-237. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, pasture, effects of frost on pasture, fungi, bacteria, reproductive loss syndrome.

Teerasak Traimongkolkul, Somchai Sajapitak, Piyawan Suthanmapinanta, Nirachara Rochanapat, Churee Pankamnerd, and Thratorn Jangploy (1998). **Kan pamoen saphawa phrae rabat khong phayat nai plaeng ya nai farm ma. [Assessment of pasture infestation by parasites in horse farm].** In: *Proceedings of the 24th Annual Conference of the Thai Veterinary Medical Association (TVMA) and the 4th Conference of the Veterinary Practitioner Association of Thailand, August 5, 1998-August 7, 1998, Bangkok (Thailand)*, Thai Veterinary Medical Association Bangkok (Thailand): p. 65-78. 372 p.

Descriptors: pasture management methods, parasite infestation, anthelmintic program, *Strongylus*.

Language of Text: Thai with English and Thai summaries.

Thamsborg, S.M., P.S. Leifsson, C. Grondahl, M. Larsen, and P. Nansen (1998). **Impact of mixed strongyle infections in foals after one month on pasture.** *Equine Veterinary Journal* 30(3): 240-245. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: foals, *Strongylus vulgaris*, grazing, nematode infections, incidence, nematode larvae, mixed infections, cyathostoma, contamination, vigor, weight gain, feces, anorexia, postmortem examinations, blood chemistry, prepatent period, albumins, globulins.

Traimongkolkul, T., S. Sajapitak, P. Suthanmapinanta, N. Rochanapat, C. Pankamnerd, and T. Jangploy (1998). **[An assessment of pasture infestation by parasites in horse farm].** *Kasetsart Journal, Natural Sciences* 32(3): 299-308. ISSN: 0075-5192.

NAL Call Number: 22.5 K153

Descriptors: horses, pasture contamination, nematoda, grazing, manure, seasonality.

Language of Text: Thai with an English summary.

Treiber, K.H., D.S. Kronfeld, T.M. Hess, B.M. Byrd, R.K. Splan, and W.B. Staniar (2006). **Evaluation of genetic and metabolic predispositions and nutritional risk factors for pasture-associated laminitis in ponies.** *Journal of the American Veterinary Medical Association* 228(10): 1538-45.

Abstract: OBJECTIVE: To evaluate genetic and metabolic predispositions and nutritional risk factors for development of pasture-associated laminitis in ponies. DESIGN: Observational cohort study. ANIMALS: 160 ponies. PROCEDURES: A previous diagnosis of laminitis was used to differentiate 54 ponies (PL group) from 106 nonlaminitic ponies (NL group). Pedigree analysis was used to determine a mode of inheritance for ponies with a previous diagnosis of laminitis. In early March, ponies were weighed and scored for body condition and basal venous blood samples were obtained. Plasma was analyzed for glucose, insulin, triglycerides, nonesterified fatty acids, and cortisol concentrations. Basal proxies for insulin sensitivity (reciprocal of the

square root of insulin [RISQI]) and insulin secretory response (modified insulin-to-glucose ratio [MIRG]) were calculated. Observations were repeated in May, when some ponies had signs of clinical laminitis. **RESULTS:** A previous diagnosis of laminitis was consistent with the expected inheritance of a dominant major gene or genes with reduced penetrance. A prelaminitic metabolic profile was defined on the basis of body condition, plasma triglyceride concentration, RISQI, and MIRG. Meeting ≥ 3 of these criteria differentiated PL- from NL-group ponies with a total predictive power of 78%. Determination of prelaminitic metabolic syndrome in March predicted 11 of 13 cases of clinical laminitis observed in May when pasture starch concentration was high. **CONCLUSIONS AND CLINICAL RELEVANCE:** Prelaminitic metabolic syndrome in apparently healthy ponies is comparable to metabolic syndromes in humans and is the first such set of risk factors to be supported by data in equids. Prelaminitic metabolic syndrome identifies ponies requiring special management, such as avoiding high starch intake that exacerbates insulin resistance.

Descriptors: equine laminitis, metabolic and genetic predisposition, nutritional risk factors, pedigree analysis, body condition scoring, basal venous blood values, insulin sensitivity, management practices.

Trillaud Geyl, C. (1995). **Quantites d'herbe ingerees par le poulain de selle en croissance au paturage. [Intake of grass by growing saddle horses on pasture].** In: *Journee de la Recherche Equine, March 1, 1995*, Institut du Cheval: Paris, France, Vol. 21, p. 68-72.

Descriptors: horses, pasture, grazing, forage intake, weight gain, mixed pasture grasses, *Festuca*, *Dactylis*, growth and lignin content of grass.

Language of Text: French with an English summary.

Trzaskos, M., H. Czyz, T. Kitzak, and J. Dmochowski (2004). **Suitability of vermicompost for improvement of low quality woodland pastures used by Shetland ponies.** In: *Land Use Systems in Grassland Dominated Regions. Proceedings of the 20th General Meeting of the European Grassland Federation, June 21, 2004-June 24, 2004, Luzern, Switzerland*, Grassland Science in Europe, p. 726-728.

Descriptors: application rates, botanical composition, calcium, chemical composition, crude protein, grass sward, magnesium, nutrient content, nutritive value, phosphorus, plant composition, potassium, protein content, woodland grasslands, *Festuca rubra*, horses, *Lolium perenne*, *Phleum pratense*, *Poa pratensis*, *Trifolium repens*.

Undersander, D.J. and R. Antoniewicz (1997). **Pastures for Horses**, University of Wisconsin--Extension, Cooperative Extension: Madison, Wisconsin, 7 p.

Online: <http://learningstore.uwex.edu/pdf/A3680.pdf>

Descriptors: pastures.

United States. Animal and Plant Health Inspection Service. Veterinary Services. Centers for Epidemiology and Animal Health. National Animal Health Monitoring System (U.S.). (1999). **Endophytes in United States Horse Pastures**, U.S. Dept. of Agriculture: Fort Collins, CO, 1 sheet, 2 p.

NAL Call Number: aSF757.5.E53 1999

Descriptors: veterinary toxicology, horse diseases and pests, United States, endophytic fungi, endophytes, pastures, mycotoxins.

Varela, E.B. (1995). **Control of the growth rate of young foals in a pasture-feeding program in Argentina.**

Proceedings From the Annual Convention of the American Association of Equine Practitioners 41: 274-275. ISSN: 0065-7182.

NAL Call Number: SF601.A46

Descriptors: foals, growth rate, Argentina, biological development, growth of horses, pasture feeding.

Watts, K.A. (2004). **Forage and pasture management for laminitic horses.** *Clinical Techniques in Equine Practice* 3(1): 88-95. ISSN: 1534-7516.

NAL Call Number: SF951.C56

Descriptors: horses, laminitis, hydrolyzable carbohydrates, fructan, metabolic disorders, forage content, management practices, feeding.

Notes: Special issue: *Laminitis*.

- Wichtel, J.J., N.D. Grace, and E.C. Firth (1998). **The effect of injectable barium selenate on the selenium status of horses on pasture.** *New Zealand Veterinary Journal* 46(5): 186-190. ISSN: 0048-0169.
NAL Call Number: 41.8 N483
Descriptors: horses, pasture, supplementation, nutrition, supplement injection, barium, selenium, trace elements.
- in all seasons, while their body weight increased in summer and during non-snowy periods in winter, and maintained during snowy periods in winter.
Descriptors: *Sasa nipponica*, nutritive value of sasa, Hokkaido native horses, Japan, seasonal comparison, body weights, feeding habits of horses.
Language of Text: English and Japanese summaries.
- Burger, S.M. (1996). **Horse Owner's Field Guide to Toxic Plants**, Breakthrough: Ossining, New York, USA, 230 p. ISBN: 0914327623.
NAL Call Number: SB617.4.B97 1996
Descriptors: poisonous plants, identification, toxicology, horses health, United States, geographical distribution.
- Giessen Univ. (Germany). Inst. fuer Tierzucht und Haustiergenetik. (1996). **Pferdeweide - Know-how. [Horse pastures - Know-how].** *Reiterjournal (Germany)* 17(2): 85-86. ISSN: 0173-2404.
Descriptors: pastures, horses, maintenance, fertilizer application, weed control, grazing systems, pasture improvement, feeding systems, grassland management, grazing lands, land resources, natural resources, pest control.
Language of Text: German.
- Adamovics, A. (2004). **Zirgu spekam un skaistumam nepieciešamas ganības. [Pastures for power and beauty of horses].** *Agro Tops(7)*: 53-55. ISSN: 1407-5164.
Abstract: This article presents requirements for management of quality horse pastures.
Descriptors: pastures, grasslands, horse pasture characteristics, fertilizer application, Latvia.
Language of Text: Latvian.
- Avery, A. (1996). **Pastures for Horses: A Winning Resource**, Rural Industries Research & Development Corporation, Dept. of Natural Resources & Environment Victoria: Victoria, Australia, 198 p. ISBN: 0642259739.
NAL Call Number: SB199.A94 1996
Descriptors: pastures, Australia, horses feeding and feeds.
- Undersander, D.J. and R. Antoniewicz (1997). **Pastures for Horses**, University of Wisconsin--Extension, Cooperative Extension: Madison, Wisconsin, 7 p.
Descriptors: pastures.
- Grace, N. (2005). **Pasture counts: The contribution of pasture to the diets of horses.** In: J.D. Pagan (Editor), *Advances in Equine Nutrition III*, Nottingham University Press: Nottingham, UK, p. 11-21. ISBN: 1904761283.
NAL Call Number: SF285.5.A39 2005
Descriptors: pasture productivity, frequently grazed pastures, disease resistant pasture species, pasture production factors, pasture utilization by horses, dry matter intakes (DMI), digestible energy intakes (DEI), Thoroughbreds, growth and development of young horses.
- Hamet, N., E. Doligez, C. Cazier, F. Chansard, C. Nizet, and C. Collobert (2000). **Definition de messages techniques coherents concernant le paturage des chevaux et la prevention du parasitisme. I. Relation entre la gestion des zones paturees et la contamination de l'herbe et des animaux. [Defining the technical advice concerning the pasturage of horses and the prevention of parasites. 1. Relationship between grazing zones of pastures and contamination of the herbage and animals].** In: *Journee de la Recherche Equine, March 1, 2000*, Les Haras Nationaux Direction du Developpement: Vol. 26, p. 45-53.
Descriptors: pasture management, stud farms, relationship between pasture management practices and internal

parasites, brood mares, foals, nutrition, disease prevention, parasite prevention.

Language of Text: French with an English summary.

Orth, D., P. Carrere, A. Lefevre, P. Duquet, Y. Michelin, E. Josien, and G. L'Homme (1997). **L'adjonction de chevaux aux bovins en conditions de sous-chargement modifie-t-elle l'utilisation de la ressource herbagere?** [Does the association of horses with cattle under under-stocked grazing conditions modify the utilization of the pasture resource?]. *Fourrages* ISSN: 0429-2766.

Descriptors: natural pastures, rangelands, highlands, stocking density, grazing intensity, mixed grazing, cattle, horses, feeding habits, Auvergne, behavior, Bovidae, Bovinae, domestic animals, Europe, feeding systems, France, grassland management, grazing systems, land resources, livestock, livestock management, natural resources, nonrenewable resources, pasture, physiographic features, ruminants, useful animals, western Europe.

Language of Text: French with English and French summaries.

Carnevale, E.M., M.J. Hermetet, and O.J. Ginther (1997). **Age and pasture effects on vernal transition in mares.** *Theriogenology* 47(5): 1009-1018. ISSN: 0093-691X.

Descriptors: mares, follicular activity, vernal transition, age, pasture, ovulation.

Pirkelmann, H. (1997). **Ohne Weide und Auslauf geht es nicht. Fuer Jungpferde kommt nur die Gruppenhaltung im Laufstall in Frage.** [Without pasture and free range nothing works. For young horses only group housing in a loose housing system is possible]. *Wuerttemberg Agricultural Weekly* 164(8): 16-18, 20. ISSN: 0043-9606.

NAL Call Number: 18 W96

Descriptors: mares, foals, animal housing, design, free range husbandry, animal welfare, loose housing system, young horse needs, pastures, farming systems, grazing lands.

Language of Text: German.

Mage, C. (1996). **Epidemiologie parasitaire chez les juments de trait au paturage (Strongles).** [Parasitic epidemiology of draft mares kept on pasture (Strongyles)]. *Revue De Medecine Veterinaire* 147(3): 211-214. ISSN: 0035-1555.

NAL Call Number: 41.8 R32

Descriptors: mares, draft horses, grazing, pastures, biological contamination, Strongyles, *Strongylus vulgaris*, parasitic infection.

Language of Text: French with English and French summaries.

McCluskey, B., J. Traub Dargatz, L. Garber, and F. Ross (1999). **Survey of endophyte infection and its associated toxin in pastures grazed by horses.** In: *Proceedings of the 45th Annual Convention of the American Association of Equine Practitioners, December 5, 1999-December 8, 1999, Albuquerque, New Mexico*, p. 213-216.

Descriptors: horses, tall fescue grass, grazing, pasture, *Neotyphodium coenophialum*, toxins, endophytes, literature reviews, surveys.

Mair, T.S. (1996). **Obstructive pulmonary disease in 18 horses at summer pasture.** *The Veterinary Record* 138(4): 89-91. ISSN: 0042-4900.

NAL Call Number: 41.8 V641

Descriptors: horses, summer, animal diseases, grazing, seasons, drug therapy, respiratory disorders, endoscopy, inflammation, granulocytes, clenbuterol, prednisolone, respiratory diseases, hypersensitivity, adrenal cortex hormones, agricultural chemicals, animal feeding, behavior, blood, blood cells, cells, corticoids, disease control, disorders, feeding habits, functional disorders, glucocorticoids, hormones, immunological diseases, leukocytes, organic diseases, seasons, therapy, dyspnoea, neutrophils, obstructive pulmonary disease.

Ryan, P., B. Rude, B. Warren, L. Boyd, D. Lang, D. Scruggs, and R. Hopper (2001). **Effects of exposing late-term pregnant mares to toxic and non-toxic endophyte-infected tall Fescue pastures.** *Biology of Reproduction* 64(Suppl. 1): 346-347. ISSN: 0006-3363.

NAL Call Number: QL876.B5

Descriptors: horses, pregnant mares, reproduction, pastures, endophytes, tall *Fescue* plants, toxicology.
Notes: Meeting Information: Thirty-fourth Annual Meeting of the Society for the Study of Reproduction, Ottawa, Ontario, Canada; July 28-August 01, 2001.

Fisher, C. (1995). **Horse care: perilous pasture plants.** *Rural Heritage* 20(2): 44-45. ISSN: 0889-2970.

NAL Call Number: SF311.E9

Descriptors: horses, poisonous plants, poisoning, *Sorghum sudanense*, *Euphorbia esula*, *Equisetum arvense*, *Trifolium hybridum*, *Pteridium aquilinum*, *Hypericum perforatum*, *Glechoma hederacea*, *Prunus serotina*, *Kalmia latifolia*, *Solanum dulcamara*, *Rhododendron maximum*, North America.

Hoveland, C.S. (2004). **New forages for horse pastures.** In: *Proceedings American Forage and Grassland Council, June 12, 2004-June 16, 2004, Roanoke, Virginia*, Vol. 13, p. 193-197.

NAL Call Number: SB193.F59

Descriptors: horses, pastures, pasture plants, forage, grazing.

Benyovovszky, B.M., K. Penksza, and J. Hausenblasz (1998). **Qualitaetsanforderungen der Pferde an die Weide. [Quality requirements of pasture for horses].** In: *Conference on Nutrition of Domestic Animals "Zadravec Erjavec Days"*, Radenci (Slovenia), Vol. 7, p. 216-223.

Descriptors: horses, pastures, grazing, grasses, quality, palatability, animal feeding, land resources, natural resources, nonrenewable resources, organoleptic properties, quality.

Language of Text: German with English, German and Slovenian summaries.

Wichtel, J.J., N.D. Grace, and E.C. Firth (1998). **The effect of injectable barium selenate on the selenium status of horses on pasture.** *New Zealand Veterinary Journal* 46(5): 186-190. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Descriptors: horses, pasture, supplementation, nutrition, supplement injection, barium, selenium, trace elements.

Meldrum, B. (2004). **Recognizing poisonous plants and poisonous plant diseases in the horse. "Do you know what is in your pasture?"**. In: *Proceedings American Forage and Grassland Council, June 12, 2004-June 16, 2004, Roanoke, Virginia*, Vol. 13, p. 186-192.

NAL Call Number: SB193.F59

Descriptors: horses, pasture plants, poisonous plants, poisoning.

Bikbulatov, Z.G., B. Satyev Kh, and V.I. Samokhvalov (1997). **[All-year-round maintenance of horses on pastures].** *Kormoproizvodstvo*(3): 24-26. ISSN: 0235-2540.

NAL Call Number: SB193.A1L8

Descriptors: horses, pasture management, pasture yield improvement.

Language of Text: Russian.

Singer, J.W., N. Bobsin, W.J. Bamka, and D. Kluchinshi (1999). **Horse pasture management.** *Journal of Equine Veterinary Science* 19(9): 540-592. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, pasture management, maintenance procedures, forage species, stocking rates, fertilization, nutrition.

Singer, J.W., W.J. Bamka, D. Kluchinski, and R. Govindasamy (2002). **Using the recommended stocking density to predict equine pasture management.** *Journal of Equine Veterinary Science* 22(2): 73-76. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, pasture management, maintenance procedures.

Craig, S. (1997). **Pasture management, indigenous veterinary care and the role of the horse in Mustang, Nepal.** In: *Rangelands and Pastoral Development in the Hindu Kush Himalayas: Proceedings of a Regional Experts' Meeting, November 5, 1996-November 7, 1996, Kathmandu, Nepal*, International Centre for Integrated Mountain Development (ICIMOD): Kathmandu, Nepal, p. 147-170.

Descriptors: horses, pasture management, grazing technique, indigenous veterinary practice.

Trillaud Geyl, C. (1995). **Quantites d'herbe ingerees par le poulain de selle en croissance au paturage. [Intake of grass by growing saddle horses on pasture]**. In: *Journee de la Recherche Equine, March 1, 1995*, Institut du Cheval: Paris, France, Vol. 21, p. 68-72.

Descriptors: horses, pasture, grazing, forage intake, weight gain, mixed pasture grasses, *Festuca*, *Dactylis*, growth and lignin content of grass.

Language of Text: French with an English summary.

Kawai, M. (2001). **[Intake and digestibility in Hokkaido native horses on woodland pasture]**. *Journal of Japanese Society of Grassland Science* 47(2): 204-211. ISSN: 0447-5933.

NAL Call Number: 60.9 J27

Descriptors: horses, pasture, grazing, feed intake, feed digestibility.

Language of Text: Japanese.

Medica, D.L., M.J. Hanaway, S.L. Ralston, and M.V.K. Sukhdeo (1996). **Grazing behavior of horses on pasture: predisposition to strongylid infection?** *Journal of Equine Veterinary Science* 16(10): 421-427. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, pasture, grazing, behavior, *Strongylus vulgaris*, parasite predisposition.

Swerczek, T.W. (2002). **Saprotrophic fungi and bacteria and commensal bacteria that infect frost-damaged pastures may be contributing to gut microbial overgrowth and lesions associated with the mare reproductive loss syndrome.** *Journal of Equine Veterinary Science* 22(6): 234-237. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, pasture, effects of frost on pasture, fungi, bacteria, reproductive loss syndrome.

Traimongkolkul, T., S. Sajapitak, P. Suthanmapinanta, N. Rochanapat, C. Pankamnerd, and T. Jangploy (1998). **[An assessment of pasture infestation by parasites in horse farm]**. *Kasetsart Journal, Natural Sciences* 32(3): 299-308. ISSN: 0075-5192.

NAL Call Number: 22.5 K153

Descriptors: horses, pasture contamination, nematoda, grazing, manure, seasonality.

Language of Text: Thai with an English summary.

Dorchies, P. (1995). **Le point sur le parasitisme du cheval au paturage. [Parasitoses of horses at pasture]**. In: *Journee de la Recherche Equine, March 1, 1995*, Institut du Cheval: Paris, France, Vol. 21, p. 78-81. ISBN: 2910610055.

Descriptors: horses, parasites, helminthoses, parasitology, anthelmintics, pasture.

Language of Text: French with an English summary.

Manteaux, J.P., N. Manteaux, and C. Casset (1996). **Prairies paturees par des chevaux pur-sang en Normandie: composition minerale des zones surpaturees. [Pastures grazed by Thoroughbred horses in Normandy: mineral composition of overgrazed areas]**. *Fourrages*(146): 149-164. ISSN: 0429-2766.

Descriptors: horses, overgrazing, pasture composition, pasture mineral composition, legumes.

Language of Text: French with an English summary.

Gallagher, J.R. and T.G. Reeves (1996). **Selenium and copper intakes of oat/vetch pasture grazed by horses.** *Journal of Animal Science* 74(Suppl. 1): 183. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, nutrition, selenium, copper, oat, vetch pasture grazing.

Notes: Meeting Information: 88th Annual Meeting of the American Society of Animal Science, Rapid City, South Dakota, USA; July 24-26, 1996.

Pearce, S.G., E.C. Firth, N.D. Grace, and P.F. Fennessy (1999). **The effect of high pasture molybdenum concentrations on the copper status of grazing horses in New Zealand.** *New Zealand Journal of Agricultural*

Research 42(1): 93-99. ISSN: 0028-8233.

NAL Call Number: 23 N4892

Descriptors: horses, nutrition, pasture content, mineral levels.

Huang, Y. (2000). [Mineral elements in pastures and blood of Hequ horse]. *Acta Prataculturae Sinica* 9(3): 32-35. ISSN: 1004-5759.

NAL Call Number: SB202.C6T73

Descriptors: horses, nutrition, forage species, mineral content, *Kobresia bellardii*, *Poa alpigena*, *Elymus nutans*, *Festuca ovina*, *Scirpus distigmaticus*, *Carex scabriostriis*, *Leontopodium nanum*, *Taraxacum mongolicum*.

Language of Text: Chinese with an English summary.

Gee, E.K., P.C.H. Morel, T.D. Mogg, E.C. Firth, N.D. Grace, and P.F. Fennessy (2004). **Liver copper kinetics in Thoroughbred foals at pasture from birth to 160 days of age.** *New Zealand Journal of Agricultural Research* 47(2): 109-118. ISSN: 0028-8233.

NAL Call Number: 23 N4892

Descriptors: horses, mares, pregnancy, copper intake, copper deficiency, orthopedic disease, copper supplementation, copper injection.

Watts, K.A. (2004). **Forage and pasture management for laminitic horses.** *Clinical Techniques in Equine Practice* 3(1): 88-95. ISSN: 1534-7516.

NAL Call Number: SF951.C56

Descriptors: horses, laminitis, hydrolyzable carbohydrates, fructan, metabolic disorders, forage content, management practices, feeding.

Notes: Special issue: *Laminitis*.

Grace, N.D., S.G. Pearce, E.C. Firth, and P.F. Fennessy (1999). **Concentrations of macro- and micro-elements in the milk of pasture-fed Thoroughbred mares.** *Australian Veterinary Journal* 77(3): 177-180. ISSN: 0005-0423.

NAL Call Number: 41.8 Au72

Descriptors: horses, lactating mares, Thoroughbreds, foals, nutrition, pasture feeding, macroelement concentration, microelement concentration, dietary mineral requirements.

Grace, N.D., H.L. Shaw, E.K. Gee, and E.C. Firth (2002). **Determination of the digestible energy intake and apparent absorption of macroelements in pasture-fed lactating Thoroughbred mares.** *New Zealand Veterinary Journal* 50(5): 182-185. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Descriptors: horses, lactating mares, nutritional value of pasture, digestible energy intake, dry matter digestibility, macroelement absorption.

Hoskin, S.O. and E.K. Gee (2004). **Feeding value of pastures for horses.** *New Zealand Veterinary Journal* 52(6): 332-341. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Abstract: The feeding value of fresh pasture grazed in situ is determined by animal performance or productivity and could be relatively easily established for growing and lactating horses. Despite this, there is a lack of published information on the relative feeding value of different pastures and forages grazed by horses in New Zealand and the world. In addition, for adult breeding or non-breeding and young or adult sport or performance horses, the definition of feeding value and its determination remain problematic. Limited information suggests that the feeding value of perennial ryegrass-based pasture in New Zealand for young growing horses is high, and growth rates for Thoroughbred horses fed solely on pasture in New Zealand are similar to those reported from the Northern Hemisphere where grain-based supplements are fed in addition to pasture or other forages. Attempts to assess the ability of fresh pastures to meet the nutrient requirements of horses are hampered by problems associated with determination of feed intake by grazing horses and lack of knowledge of the digestibility and utilisation of digested nutrients, including the relative bioavailability of macro- and micro-minerals in pasture. A further challenge for future research is to determine the effect of herbage allowance and grazing behaviour, including pasture species preferences, on voluntary feed intake by grazing horses. Grazing

pasture has benefits for equine health and well-being including reduced risk of some nutrition-related disorders and reduced prevalence of stereotypic behaviour. Pastured horses have greater freedom for expression of natural behaviours including social interaction and exercise. However, grazing pasture is also associated with animal health problems, particularly parasitism and diseases related to pasture-associated toxins.

Descriptors: horses, growth, lactation, feed value, performance, productivity, grazing pasture, forages, parasites.

Dvojnjos, G., L. Balachov, and N. Samzuk (1999). **[Wild horses in grazing management of pastures in Chernobyl exclusion zone (in Polesje)].** *Vestnik Zoologii Supplement* 11: 67-71.

Descriptors: horses, grazing, pasture management.

Language of Text: Russian.

Crane, K., M. Smith, and D. Reynolds (1995). **Horse pasture.** *Wyoming Wildlife* 59(3): 32-35. ISSN: 0043-9819.

Descriptors: horses, grazing, pasture.

Gallagher, J.R. (1996). **The potential of pasture to supply the nutritional requirements of grazing horses.**

Australian Veterinary Journal 73(2): 67-68. ISSN: 0005-0423.

NAL Call Number: 41.8 Au72

Descriptors: horses, grazing, nutritional state, pastures, irrigated pastures, feeding preferences, seasonal variation, grazing behavior, horse diseases, nutritive value, literature reviews, Australia, dryland pastures.

Moulin, C. (2000). **Comment aborder le conseil sur le paturage en productions equines? Les enseignements techniques et methodologiques de travaux sur le fonctionnement des systemes d'alimentation. [How does one approach pasture production for horses? The effect of acquired techniques and methods on digestive tract function].** In: *Journee de la Recherche Equine, March 1, 2000*, Les Haras Nationaux Direction Du Developpement: Paris, France, Vol. 26, p. 65-77.

Descriptors: horses, grazing, feeding systems, pasture management, adequate nutrition, pasture diversity, surveys.

Language of Text: French with an English summary.

Kapron, B. and B. Nowakowicz Debek (2003). **Effect of winter weight gains on pasture grass intake capacity of saddle breed foals aged 12-18 months.** *Annals of Animal Science* 3(1): 47-54. ISSN: 1642-3402.

NAL Call Number: SF1.A66

Descriptors: horses, foals, weight gain, seasonality, feed intake, compensatory growth, concentrate, digestive system, development, pasture.

Language of Text: English with an Polish summary.

Mage, C., C. Trillaud Geyl, and G. Arnaud (1995). **Epidemiologie de l'infestation des jeunes chevaux au paturage par les strongles gastro-intestinaux. [Epidemiology of gastrointestinal strongyle infection in young horses on pasture].** *Revue De Medecine Veterinaire* 146(1): 41-44.

Descriptors: horses, epidemiological studies, parasitology, pasture contamination.

Language of Text: French with an English summary.

Kronfeld, D.S. (1997). **Variations in energy requirements of horses and errors in estimation of pasture intake.** In: *Proceedings of the 15th Equine Nutrition and Physiology Symposium, May 28, 1997-May 31, 1997, Fort Worth, Texas, USA*, Savoy, USA: Equine Nutrition & Physiology Society Publications, p. 383.

Descriptors: horses, energy requirement, pasture intake.

Barbosa, O.F., U.F. Rocha, G.S. da Silva, V.E. Soares, V.A. Veronez, G.P. de Oliveira, V.J.C. Landim, and A.J. da Costa (2001). **A survey on Cyathostominae nematodes (Strongylidae, Strongylidae) in pasture bred horses from Sao Paulo State, Brazil.** *Semina: Ciencias Agrarias Londrina* 22(1): 21-26. ISSN: 1676-546X.

Online: http://www.uel.br/proppg/semina/pdf/semina_22_1_19_9.pdf

Descriptors: horses, effect of age differences on infection, nematode infection, epidemiology, intestinal contamination.

Language of Text: English with a Portuguese summary.

- Benyovszky, B.M. and K. Penksza (2002). **A N-mutragyazas optimalis szintje a kedveltseg szempontjabol egy isaszegi lolegelon. [Optimal level of N fertilization considering feeding preference in a horse paddock].** *Novenytermeles* 51(5): 509-512. ISSN: 0546-8191.
Descriptors: horses, controlled grazing, grasslands, *Bromus inermis*, *Festuca rubra*, *Poa pratensis*, *Bromus*, Equidae, feeding systems, *Festuca*, grazing systems, land cover, mammals, Perissodactyla, *Poa*, Poaceae, vegetation.
Language of Text: Hungarian with English and Hungarian summaries.
- Mesochina, P., J.L. Peyraud, P. Duncan, D. Micol, and C. Trillaud Geyl (2000). **Ingestion d'herbe au paturage par le cheval de selle en croissance: effet de l'age des poulains et de la biomasse d'herbe. [Grass intake by growing horses at pasture: a test of the effects of the horses' age and sward biomass].** *Annales De Zootechnie* 49(6): 505-515. ISSN: 0003-424X.
NAL Call Number: 49 F84
Descriptors: horses, age variation, nutrition, pasture intake, grazing preference, *Medicago sativa*, *Dactylis glomerata*, *Lolium perenne*, *Trifolium repens*, *Taraxacum officinale*, *Poa pratensis*.
Language of Text: French with an English summary.
- Singer, J.W., D. Kluchinski, W.J. Bamka, N. Bobsin, and R. Govindasamy (2002). **Effectiveness of cooperative extension equine pasture management programs.** *Journal of Natural Resources and Life Sciences Education* 31: 59-61. ISSN: 1059-9053.
NAL Call Number: S530.J6
Descriptors: horse pastures, cooperative extension services, surveys.
- Hoffman, R.M. (2000). **Optimal nutrition and supplementation of horses on pasture.** In: *62nd Cornell Nutrition Conference for Feed Manufacturers Proceedings, October 24, 2000-October 26, 2000, Rochester, New York*, Departments of Poultry Husbandry, Animal Husbandry, and Biochemistry and Nutrition, New York State College of Agriculture, and the Graduate School of Nutrition, Cornell University, in cooperation with the American Feed Manufacturers' Association: Ithaca. New York, USA, p. 89-99.
NAL Call Number: 389.79 C81
Descriptors: horse feeding, diet, mineral supplements, nutrient requirements, grazing, feed intake, nutrient content, vitamin supplements, protein supplements, dietary carbohydrate, dietary fat, growth, bones, milk composition, blood sugar, feed supplements, nutrition physiology, product development.
- Kawai, M., H. Hisano, Y. Yabu, N. Yabu, and S. Matsuoka (2004). **Effects of fallen snow on the voluntary intake and grazing behavior of Hokkaido native horses in winter woodland with underlying *Sasa senanensis*.** *Animal Science Journal* 75(5): 435-440. ISSN: 1344-3941.
Descriptors: grazing behavior, seasonal variation, effect of snowfall, feed intake, feed digestibility.
- Fleurance, G., P. Duncan, and C. Menard (2000). **Utilisation heterogene d'une prairie par des chevaux: Relations avec les caracteristiques de la vegetation et l'etat d'infestation parasitaire de la pature. [Heterogeneous use of a prairie by horses: Relations between the vegetation characteristics and the parasitic infestation of the pasture].** In: *Journee de la Recherche Equine, March 1, 2000*, Les Haras Nationaux Direction Du Developpement: Paris, France, Vol. 26, p. 153-165.
NAL Call Number:
Descriptors: grazing behavior, grass height and variety, grass intake, feeding preference, selective feeding, preference for shorter grasses, reduction of parasitic infestation, Mulassier Poitevan mares, wet grassland.
Language of Text: French with an English summary.
- Kawai, M., N. Yabu, T. Asa, K. Deguchi, and S. Matsuoka (2005). **Intake, digestibility and rate of passage of grass in grazing by light breed horses on different pastures.** In: *XX International Grassland Congress: Offered Papers, June 26, 2005-July 1, 2005, Dublin, Ireland*, Wageningen Academic Publishers: Wageningen, Netherlands, 515 p. ISBN: 9076998817.
Descriptors: grazing behavior, digestive system, forage intake, passage rate.

- Ince, J.C., A.C. Longland, M. Moore Colyer, C.J. Newbold, C. Drakley, and P. Harris (2005). **A pilot study to estimate the intake of grass by ponies with restricted access to pasture.** In: *Proceedings of the British Society of Animal Science Annual Conference, April 4, 2005-April 6, 2005, York, UK*, British Society of Animal Science: Penicuik, United Kingdom, p. 109. ISBN: 0906562473.
NAL Call Number:
Descriptors: grass intake, weight gain, pasture management and production, feeding restriction, pilot studies, access to pasture, ponies.
- Varela, E.B. (1995). **Control of the growth rate of young foals in a pasture-feeding program in Argentina.** *Proceedings From the Annual Convention of the American Association of Equine Practitioners* 41: 274-275. ISSN: 0065-7182.
NAL Call Number: SF601.A46
Descriptors: foals, growth rate, Argentina, biological development, growth of horses, pasture feeding.
- Hunt, W.F. (1997). **Research on foal growth under various pasture conditions.** *Proceedings of the Annual Seminar of the Equine Branch of the New Zealand Veterinary Association (NZVA)* 174: 27-35. ISSN: 0112-9643.
NAL Call Number: SF604.P82
Descriptors: foals, grazing, nutrition, skeletal growth, weight gain, high-endophyte ryegrass, chicory, Tama ryegrass, *Lolium multiflorum* cv. *Tama*, measurement techniques.
- Hoffman, R.M., J.A. Wilson, D.S. Kronfeld, W.L. Cooper, L.A. Lawrence, D. Sklan, and P.A. Harris (2001). **Hydrolyzable carbohydrates in pasture, hay, and horse feeds: direct assay and seasonal variation.** *Journal of Animal Science* 79(2): 500-506. ISSN: 0021-8812.
NAL Call Number: 49 J82
Descriptors: feed, nutrition, hydrolyzable carbohydrates, forages, concentrates, nonstructural carbohydrate, hydrolyzable carbohydrate concentration, near-infrared spectrum, seasonal variation, rapidly fermentable carbohydrates, laminitis, colic.
- Anonymous (2004). **Pasture fructan concentration as a cause of equine laminitis.** *Journal of Equine Veterinary Science* 24(12): 542. ISSN: 0737-0806.
NAL Call Number: SF951.J65
Descriptors: equine foot disease, laminitis, effects of pasture, starch digestion, pasture management practices, grazing management practices, fructans.
- Coletto, L. (1999). **Equine babesiosis: A disease linked to the extensive horse raising in the pasture land of Extremadura ("dehesa").** *Cahiers Options Mediterraneennes* 39: 273-276. ISSN: 1022-1379.
Abstract: Serologic testing was carried out to show antibodies to *Babesia equi* and *Babesia caballi* in mares raised in extensive regime in the "dehesa" of Extremadura, their transmission to the mares' offspring and their permanence in the foals. We have studied 33 Andalusian mare and foal serums. The technique used has been that of indirect immunofluorescence (IFI). The result is 63.6 per cent of the mares and 54.5 per cent of the foals seropositive to *B. equi*. All serums were negative to *B. caballi*.
Descriptors: *Babesia equi*, immunofluorescence, Spain, *Babesia*, Europe, immunological techniques, piroplasma, protozoa, southern Europe, sporozoa, western Europe.
Language of Text: English and French summaries.
Notes: Meeting Information: Meeting of the Mediterranean Sub Network of the FAO CIHEAM Inter Regional Cooperative Research and Development Network on Pastures and Fodder Crops. Badajoz (Spain). 26-29 Nov 1997.
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Pasture -- Web Resources

Horse Nutrition, Bulletin 762-00, Pasture Management.

Online: http://ohioline.osu.edu/b762/b762_19.html

Description: Pasture improvement strategies including weed control, maximizing soil fertility, rotation of grazing land, and regular renovation.

Horse Pasture Management.

Online: <http://www.rce.rutgers.edu/horsepastures/>

Description: Pasture management strategies to enhance welfare of horses and efficiency of land maintenance. Includes information on pasture species, toxic plants, soil fertility, and weed control.

Manure and Pasture Management for Recreational Horse Owners.

Online: http://www.extension.umn.edu/distribution/naturalresources/components/7540_05.html

Description: Strategies for efficient use of pasture. Includes a calendar that summarizes pasture management practices for March through October.

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Last updated: October 25, 2011



PMU Ranching

- Ban, I., F. Borchers, H. Heinemann, and H.H. Rasche (Inventors) (1998). **Method for obtaining estrogens from pregnant mare urine by solid-phase extraction.** (US 5814624, September 29, 1998). *Official Gazette of the United States Patent and Trademark Office Patents*, 1214 (5): 5330. ISSN: 0098-1133.
Online: <http://www.uspto.gov/patft/index.html>
Descriptors: estrogen extraction methods, pregnant mare urine, solid phase extraction, PMU.
- Ban, I., H. Heinemann, G. Mechtold, and H.H. Rasche (Inventors) (1998). **Method for obtained estrogens from pregnant mare urine by solid phase extraction on a semi-polar adsorber resin.** (US 5723454, March 3, 1998). *Official Gazette of the United States Patent and Trademark Office Patents*, 1208 (1): 451. ISSN: 0098-1133.
Online: <http://www.uspto.gov/patft/index.html>
Descriptors: estrogen extraction methods, hormone replacement therapy, pregnant mare urine, solid-phase extraction, semi-polar adsorber resin.
- Baumgartner, A.R. (1999). **Proud of Premarin.** *Canadian Medical Association Journal* 160(13): 1821.
Descriptors: animal welfare, drug industry, estrogens, pregnant mares urine, PMU ranching, Canada.
Notes: Comment In: *Canadian Medical Association Journal*. 1999 Nov 30;161(11):1389-1390.
- Clay, S.A. (1995). **Controversy over use of pregnant mare's urine.** *Canadian Medical Association Journal* 152(11): 1746-1748.
Descriptors: animal rights, drug industry, estrogens, horses, professional ethics, pregnant mares urine, horse welfare.
Notes: Comment On: *Canadian Medical Association Journal*. 1994 Oct 1;151(7):1009-1012.
- Comm, M. (1995). **Controversy over use of pregnant mare's urine.** *Canadian Medical Association Journal* 152(11): 1745-1746.
Descriptors: animal rights, drug industry, estrogens, pregnant mares urine, Canada, ethics.
Notes: Comment On: *Canadian Medical Association Journal*. 1994 Oct 1;151(7):1009-1012.
- Cox, D. (1996). **Should a doctor prescribe hormone replacement therapy which has been manufactured from mare's urine?** *Journal of Medical Ethics* 22(4): 199-203.
Abstract: Many clinicians are experiencing consumer resistance to the prescription of equine HRT (that is hormone replacement therapy which has been manufactured from mare's urine). In this paper I consider the ethical implications of prescribing these preparations. I decide that patients should have a right to refuse such treatment but also ask whether a prescribing doctor should choose one preparation over another on moral grounds. I determine that there is prima facie evidence to suggest that mares may suffer and that prescription of equine HRT (instead of synthetic oestrogen-oestriol) would therefore have to be justified in terms of either offering greater benefits to the women or offering greater value for money to the health service. I find that there is no substantial evidence to suggest that equine HRT offers unique advantages over and above oestriol. I

conclude that it would be preferable for a doctor to recommend the synthetic oestrogen to women who want relief from the symptoms of the menopause and protection from osteoporosis and cardiovascular disease.

Descriptors: animal rights activism, estriol, estrogen replacement therapy, medical ethics, moral obligations, urine chemistry, bone density, horses, menopause drug effects, suffering of mares, synthetic estrogen.

DiVita, L.J. (2002). **Veterinary, equine community dispel accusations against the pregnant mare urine industry.** *Journal of the American Veterinary Medical Association* 220(8): 1130-1131. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: animal welfare, horses, pregnant mares urine, animal rights, drug industry, estrogens, animal housing, horse welfare.

Notes: Comment In: *Journal of the American Veterinary Medical Association*. 2002 Jun 15;220(12):1778.

Evans, M. (2002). **Thinks pregnant mare urine industry inhumane.** *Journal of the American Veterinary Medical Association* 220(11): 1612; Author Reply 1612-1613. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: animal welfare, estrogens in urine, horses, equine housing, pregnant mares urine, PMU ranching.

Flannigan, G. and J.M. Stookey (2002). **Day-time time budgets of pregnant mares housed in tie stalls: a comparison of draft versus light mares.** *Applied Animal Behaviour Science* 78(2-4): 125-143. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: pregnant mare urine (PMU), comparison of behaviors between draft and light pregnant mares, recording of behavioral activities, stereotypic behavior, time budgets, low prevalence of stereotypic behavior of mares in tie-stalls, management systems.

Freeman, D.A. (2002). **More on the pregnant mare urine industry.** *Journal of the American Veterinary Medical Association* 220(12): 1778. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: animal husbandry, animal welfare, equine housing, pregnant mares urine, PMU ranching.

Notes: Comment On: *Journal of the American Veterinary Medical Association*. 2002 Apr 15;220(8):1130-1131.

Freeman, D.A. (2000). **The pregnant mares' urine industry--management and research.** *Journal of the American Veterinary Medical Association* 216(8): 1239-1242. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: mares, pregnancy, urine, biological production, animal welfare, animal husbandry.

Freeman, D.A., N.F. Cymbaluk, B. Kyle, H.C. Schott II, K.W. Hinchcliff, and S.M. McDonnell (1998). **Health and welfare of stabled PMU mares under varied water and turnout schedules. 1. Physiology.** In: *Proceedings from the Annual Convention of the American Association of Equine Practitioners, December 6, 1998-December 9, 1998, Baltimore, Maryland, USA*, Vol. 44, p. 19-20.

NAL Call Number: SF601.A46

Descriptors: urine, animal welfare, water intake, pregnant mare urine.

Frink, M. (Inventor) (2005). **Urine collection device with a detachable head part.** (US 06854427, February 15, 2005). *Official Gazette of the United States Patent and Trademark Office Patents*. ISSN: 0098-1133.

Online: <http://www.uspto.gov/patft/index.html>

Descriptors: horse urine collection device with detachable head part, pregnant mares urine, collection of urine, holding harness, horse welfare and comfort, allows possibility of grazing.

Frink, M. (Inventor) (2003). **Holding harness with urine collecting device.** (US 6666171, December 23, 2003). *Official Gazette of the United States Patent and Trademark Office Patents*, 1277 (4). ISSN: 0098-1133.

Online: <http://www.uspto.gov/patft/index.html>

Descriptors: holding harness, urine collecting device, patent, comfort of wear for horse, freedom of movement, allows possibility to graze instead of tethered in narrow stall.

- Haupt, K., T.R. Haupt, J.L. Johnson, H.N. Erb, and S.C. Yeon (2001). **The effect of exercise deprivation on the behaviour and physiology of straight stall confined pregnant mares.** *Animal Welfare* 10(3): 257-267. ISSN: 0962-7286.
NAL Call Number: HV4701.A557
Descriptors: horses, mares, pregnancy, animal welfare, housing, straight stalls, exercise limitation, behavior, plasma cortisol levels, cortisol response to ACTH, rebound locomotion.
- Jongman, E.C., I. Bidstrup, and P.H. Hemsworth (2005). **Behavioural and physiological measures of welfare of pregnant mares fitted with a novel urine collection device.** *Applied Animal Behaviour Science* 93(1-2): 147-163. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: horse welfare, pregnant mare urine (PMU), collection device, housing, welfare.
- Lamb, C., J.E. Tilton, R. Weigl, and P.M. Swantek (1995). **Free choice water and long term confinement effects on hormone production in the pregnant mare.** *Journal of Animal Science* 73(Suppl. 1): 215. ISSN: 0021-8812.
NAL Call Number: 49 J82
Descriptors: horses, mares, pregnancy, reproduction, endocrine system, effects of housing, hydration, animal welfare.
Notes: Meeting Information: 87th Annual Meeting of the American Society of Animal Science, Orlando, Florida, USA; July 25-28, 1995.
- Lamb, C., R.M. Weigl, and J.E. Tilton (1997). **Water intake and confinement effects on estrogen and cortisol production in pregnant mares.** *North Dakota Agricultural Research* Fall 1997
Online: <http://www.ag.ndsu.nodak.edu/ndagres/fall97/ar21197a.htm>
Descriptors: mares, pregnancy, estradiol, hydrocortisone, hormone secretion, urine, water intake, stalls, exercise, confinement in tie-stalls, restricted water intake.
- Luba, N.K. (1999). **PMU ranching demonstrates benefits of self-regulation.** *Animal Welfare Information Center Bulletin* 10(1/2): 7-9. ISSN: 1522-7553.
NAL Call Number: aHV4701.A952
Descriptors: pregnant mares urine, PMU, mare, animal welfare, inspection, collection, crossbreeding, foals.
- Malinowski, K. and N. Luba (2004). **The equine industry - economic and societal impact.** In: *Perspectives in World Food and Agriculture 2004*, Iowa State Press: Ames, Iowa, USA, p. 187-204.
Descriptors: economic and social impacts of the horse industry, North America, horse racing, hippotherapy, PMU ranching, estrogen replacement hormones, equine import and export, horses as livestock, animal welfare.
- McDonnell, S.M., D.A. Freeman, N.F. Cymbaluk, B. Kyle, H.C. Shott II, and K.W. Hinchcliff (1998). **Health and welfare of stabled PMU mares under various watering methods and turnout schedules. 2. Behavior.** In: *Proceedings from the Annual Convention of the American Association of Equine Practitioners, December 6, 1998-December 9, 1998, Baltimore, MD*, Vol. 44, p. 21-22.
NAL Call Number: SF601.A46
Descriptors: urine, animal behavior, water intake, animal welfare, pregnant mare urine.
- Murray, E.J.B. (2005). **Effects of animal rights activism and the women's health initiative findings on the well-being of mares used in Premarin production.** *Journal of Bone and Mineral Research* 20(9, Suppl. 1): S403. ISSN: 0884-0431.
Descriptors: animal rights activism, PMU ranching, horse welfare, mares, production of Premarin.
Notes: Meeting Information: 27th Annual Meeting of the American Society for Bone and Mineral Research, Nashville, TN, USA; September 23 -27, 2005.
- Stopps, R. (1995). **Pregnant mare's urine: Welfare or rights for animals?** *Canadian Medical Association Journal* 153(5): 520.
Descriptors: animal rights, horses urine, animal husbandry, Premarin production, PMU ranching, horse welfare.
Notes: Comment On: *Canadian Medical Association Journal*. 1995 Jun 1;152(11):1745.

Van den Berg, I.S. (1996). **Modified apparatus for collection of free-flow urine from mares.** *Journal of the South African Veterinary Association* 67(4): 214-216. ISSN: 0038-2809.

Abstract: An apparatus for collection of free-flow urine from female horses is described. This apparatus is a modification of a similar device described previously. It allows the collection of voided urine from adult female horses without confining them to metabolic stables or resorting to invasive procedures like bladder catheterization. It is relatively easy to use after a short adaptation period.

Descriptors: urine, equipment design, free flow urine collection, pregnant mares, horse welfare, alternative to metabolic stalls or bladder catheterization.

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Safety

- Ahlswede, L. (2000). **Gesundheitliche Aspekte und Sorgfaltspflichten bei der Jungpferdeaufzucht. [Health aspects and duty of care in horse rearing]**. *Deutsche Tierärztliche Wochenschrift* 107(3): 104-106. ISSN: 0341-6593.
NAL Call Number: 41.8 D482
Descriptors: horses, effects of genetics and management on health risks, infectious disease prevention.
Language of Text: German.
- Appel, G., A. Briese, K.V. Holleben, G.V. Mickwitz, and M.V. Wenzlawowicz (1995). **Toedlicher Unfall eines Pferdes durch einen zu niedrigen Querbalken ueber der Boxentuer. [Lethal accident of a horse by transverse beam in the box door]**. *Deutsche Tierärztliche Wochenschrift* 102(6): 233-234. ISSN: 0341-6593.
NAL Call Number: 41.8 D482
Descriptors: horses, animal husbandry, animal housing, fractures, head, accident prevention, body parts, body regions, lesions, safety.
Language of Text: German.
- Birdsong, J.P. (Inventor) (2003). **Safety harness for transporting and training large animals.** (US 6612265, September 2, 2003). *Official Gazette of the United States Patent and Trademark Office Patents*, 1274 (1). ISSN: 0098-1133.
Online: <http://www.uspto.gov/patft/index.html>
Descriptors: horses, transportation, restraint, safety harness.
- Bockisch, F.J. and P. Kreimeier (2002). **Aspekte zur Auslaufgestaltung in Pferdehaltungssystemen. [Aspects in the design of outruns for horse keeping systems]**. *Landtechnik* 57(6): 332-333. ISSN: 0023-8082.
NAL Call Number: 58.8 L235
Descriptors: horses, animal welfare, German animal protection law, housing systems.
Language of Text: German with an English summary.
- Cockram, M.S. and M.A. Mitchell (1999). **Role of research in the formulation of 'rules' to protect the welfare of farm animals during road transportation.** In: *Farm Animal Welfare - Who Writes the Rules? Proceedings of an International Symposium Organized by The British Society of Animal Science*, Occasional Publication, British Society of Animal Science: Edinburgh, UK, Vol. 23, p. 43-64.
Descriptors: temperature, stress, transport, animal welfare, land transportation, farm animals.
- Coumbe, K.M. (Editor) (2001). *The Equine Veterinary Nursing Manual*, Blackwell Science: Malden, Massachusetts, USA, 449 p. ISBN: 0632057270.
NAL Call Number: SF951.E68 2001
Descriptors: horses, anatomy, nutrition, physiology, reproduction, genetics, anesthesia, first aid, equine management.

- Coumbe, K. and K. Bush (2004). *Complete Equine Emergency Bible*, David and Charles: Newton Abbot, UK, 192 p. ISBN: 0715316958.
Descriptors: horses, emergency, first aid, insurance, fire, accident prevention, transport safety.
- Craigmill, A.L., M. Rangel Lugo, P. Damian, and J.E. Riviere (1997). **Extralabel use of tranquilizers and general anesthetics.** *Journal of the American Veterinary Medical Association* 211(3): 302-304. ISSN: 0003-1488.
NAL Call Number: 41.8 Am3
Descriptors: tranquilizers, anesthesia, lidocaine, detomidine hydrochloride, acepromazine maleate, yohimbine, zolazepam, guaifenesin, atropine, tiletamine hydrochloride, ketamine hydrochloride, xylazine.
- DeHaven, W.R. (2000). **The Horse Protection Act - A case study in industry self-regulation.** *Journal of the American Veterinary Medical Association* 216(8): 1250-1253. ISSN: 0003-1488.
NAL Call Number: 41.8 Am3
Descriptors: legislation, law, animal welfare, gaited horses, Horse Protection Act, United States.
Notes: Meeting Information: Presented at the 1999 AVMA Animal Welfare Forum.
- Grandin, T. (1999). **Safe handling of large animals.** *Occupational Medicine: State of the Art Reviews* 14(2): 195-212. ISSN: 0885-114X.
Descriptors: large animals, animal welfare, safety, behavior, handling, training.
Notes: Special issue: *Animal Handlers*.
- Hayes, M.H. (2002). *Veterinary Notes for Horse Owners*, 18th edition, Simon and Schuster: New York, New York, USA, 880 p. ISBN: 0091862779.
NAL Call Number: SF951.H382 2002
Descriptors: horse diseases, horse care, emergencies, veterinary care, equine veterinarians, veterinary handbook.
- Hayes, K. (1995). *Emergency: The Active Horseman's Book of Emergency Care*, Half Halt Press: Boonsboro, Maryland, USA, 232 p. ISBN: 0939481421.
Descriptors: horses, wounds, veterinary medicine, first aid, health protection, lesions, safety, treatment, diseases, emergency care.
- Huntington, P., J. Myers and E. Owens (2004). *Horse Sense: The Guide to Horse Care in Australia and New Zealand*, 2nd edition, CSIRO: Collingwood, Victoria, Australia, 341 p. ISBN: 0643065989.
NAL Call Number: SF285.H86 2004
Descriptors: horses, buying and selling, leasing a horse, health and nutrition, feeds and supplements, techniques for breaking in young horses, management practices, animal welfare, first aid, nutrition, facility management, transportation, training, dealing with difficult horses, diseases, parasites, handling, riding, employment in the horse industry, Australia, New Zealand.
- Miller, R.M. (1998). **Defensive horsemanship on the ground.** *Journal of Equine Veterinary Science* 18(4): 228-130. ISSN: 0737-0806.
NAL Call Number: SF951.J65
Descriptors: horse sports, animal husbandry, safety around horses, behavior, recreation, horseback riding.
- Morrow, W.E.M. and R.A. Mowrey (1997). **Safety around horses.** In: R.L. Langley, R.L. McLymore, W.J. Meggs and G.T. Roberson (Editors), *Safety and Health in Agriculture, Forestry, and Fisheries*, Government Institutes, Inc.: Rockville, MD, p. 315-320. ISBN: 0865875529.
Descriptors: horses, handling safety, hazards.
- Myers, J. (2005). *Horse Safe: a Complete Guide to Equine Safety*, 174 p.
Descriptors: animal behavior, equipment, horse riding, riding animals, safety, training of animals, transport of animals, horses.

- Nadeau, J.A., E.A. McCabe Alger, and A. Bialczak (2003). **Reducing catastrophic injury through helmet safety awareness.** *Journal of Dairy Science* 86(Suppl. 1): 164. ISSN: 0022-0302.
NAL Call Number: 44.8 J822
Descriptors: animal handling, safety, helmets.
Notes: Meeting Information: Joint Annual Meeting of the American Dairy Science Association, the American Society of Animal Science and the Mexican Association of Animal Production, Phoenix, Arizona, USA; June 22-26, 2003.
- Orsini, J.A. and T.J. Divers (2003). **Manual of Equine Emergencies: Treatment and Procedures**, 2nd edition, Saunders: Philadelphia, Pennsylvania, USA, 912 p. ISBN: 0721692982.
NAL Call Number: SF951.O77 2003
Descriptors: veterinary manual, emergency care of horses, surgical procedures, disaster management, drug information and administration, bleeding disorders, veterinary procedures, interpretation methods, nutritional guidelines, anesthesia, euthanasia, CPR, vaccination schedules, horse breed registry information.
- Singer, E.R., F. Saxby, and N.P. French (2003). **A retrospective case-control study of horse falls in the sport of horse trials and three-day eventing.** *Equine Veterinary Journal* 35(2): 139-145. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, competition, three day eventing, accidents, risk factors, cross-country course safety.
- Swinker, A. (2000). **Fire safety: 30 seconds is all the horse has.** *Journal of Equine Veterinary Science* 20(6): 364-402. ISSN: 0737-0806.
NAL Call Number: SF951.J65
Descriptors: horses, housing, fire safety, fire prevention.
- Wernery, U. and R. Wernery (2004). **Tierhaltung und veterinärmedizinische Aspekte in den Vereinigten Arabischen Emiraten (VAE). [Animal husbandry and veterinary medical aspects in the United Arab Emirates (UAE)].** *Tierärztliche Umschau* 59(9): 534-538. ISSN: 0049-3864.
NAL Call Number: 41.8 T445
Descriptors: horses, dromedaries, falcons, racehorses, management in extreme climates, veterinary research, vaccines, animal health.
Language of Text: German with an English summary.
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Safety -- Web Resources

Disaster Guidelines.

Online: <http://www.marylandhorseindustry.org/disaster.htm>

Description: Plan of action for before, during, and after a natural disaster.

Disaster Preparedness - American Veterinary Medical Association (AVMA).

Online: <http://www.avma.org/disaster/default.asp>

Description: Link to purchase the [AVMA Disaster Preparedness and Response Guide](#), published by the American Veterinary Medical Association which is geared toward individuals in the veterinary or emergency management fields as well as anyone interested in disaster planning for animals.

Emergency and Disaster Preparedness. *American Association of Equine Practitioners.*

Online: http://www.aaep.org/emergency_prep.htm

Description: Provides resources for equine practitioners and horse owners, including guidelines and hurricane equine evacuation.

Fire Safety for Horse Owners.

Online: <http://www.plumasfiresafe.org/equine.htm>

Description: Tips on how to minimize fire hazards, create an emergency kit, and develop an evacuation plan. Information geared toward wildfires.

Fire Safety in Horse Stables. *Zajackowski, J.S. and E. Wheeler.*

Online: <http://www.abe.psu.edu/extension/factsheets/g/G100.pdf>

Description: Extensive fire prevention and preparation information including barn construction, storage, and general management methods to minimize hazardous potential. Details on hay fires and fire extinguisher types and uses.

Animal Management in Disasters.

Online: <http://www.animaldisasters.com/>

Description: Geared toward animal caretakers and professionals in emergency management. Provides information, planning guidelines, references, and research tools.

Guidelines for Horses During Disasters: Information for Veterinarians. *Heath, S.E.*

Online: http://www.avma.org/disaster/responseguide/F_horses.pdf

Description: Geared toward veterinarians. Contains methods of animal identification, restraint, and confinement. Addresses specific health and sanitation concerns and includes a chart with specific drug doses depending on animal weight.

NASD: Fire Prevention and Safety Measures around the Farm. *Margentino, M.R. and Karyn Malinowski .*

Online: http://nasdonline.org/static_content/documents/1048/d000843.pdf

Description: Fire safety with regard to barn construction, electrical systems, and lighting protection. Also lists common farm fire hazards.

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Training

Aguera, E.I., M.D. Rubio, R. Vivo, R. Santisteban, A. Munoz, and F. Castejon (1995). **Blood parameter and heart rate response to training in Andalusian horses.** *Revista Espanola De Fisiologia* 51(2): 55-64.

Descriptors: horses, Andalusian horses, training response, physiological effects of training.

Alberghina, D., P. Medica, F. Cusumano, A. Ferlazzo, and S.J. Wickler (2001). **Effetto dell' allevamento sui livelli circolanti di ACTH e beta-endorfina in cavalli sottoposti a test d' esercizio standardizzato su treadmill. Nota preliminare (adrenocorticotropina). [Effect of training on circulating ACTH and beta-endorphin of horses after standardized exercise test on treadmill. A preliminary study (AdrenoCorticoTropic Hormone)].** *Atti Della Societa' Italiana Delle Scienze Veterinarie* 55: 63-64. ISSN: 0518-3588.

Abstract: Beta-endorphin and ACTH response was examined after SET (Standardized Exercise Test) on horses during a training protocol of two months. A significant increase after SET on hormonal levels was detected. Basal values and hormonal response to exercise significantly decreased during training period.

Descriptors: treadmill exercise tests, corticotropin, physical activity, endorphins, physiological regulation, effect of training on hormone levels.

Language of Text: Italian.

Arai, T., T. Kawaue, M. Abe, E. Kuramoto, R. Nuruki, and T. Sako (1997). **Glycolytic enzyme activities in leukocytes of Thoroughbreds undergoing training exercise.** *Journal of Equine Science* 8(4): 113-116. ISSN: 1340-3516.

NAL Call Number: SF277.J37

Descriptors: horses, effects of training on enzyme activity.

Avelar, D.C.B. (1997). **Training techniques of military police horses.** *Revista Brasileira De Reproducao Animal* 21(3): 151-157.

Descriptors: horses, training for public service, police horses, military horses.

Avellini, L., E. Chiaradia, and A. Gaiti (1999). **Effect of exercise training, selenium and vitamin E on some free radical scavengers in horses (*Equus caballus*).** *Comparative Biochemistry and Physiology B* 123(2): 147-154. ISSN: 1096-4959.

Descriptors: horses, training, selenium, vitamin E, free radical savengers.

Avellini, L., M. Silvestrelli, and A. Gaiti (1995). **Training-induced modifications in some biochemical defences against free radicals in equine erythrocytes.** *Veterinary Research Communications* 19(3): 179-184. ISSN: 0165-7380.

NAL Call Number: SF601.V38

Descriptors: horses, effects of training on biochemical defense.

Back, W., J.L.M.A. Remmen, J. Knaap, and J.J. De Koning (2003). **Effect of lateral heel wedges on sagittal and transverse plane kinematics of trotting Shetland ponies and the influence of feeding and training regimes.** *Equine Veterinary Journal* 35(6): 606-612. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, lateral heel wedges, shoeing, Shetland ponies, training, feeding.

Boffi, F.M., J. Cittar, G. Balskus, M. Muriel, and E. Desmaras (2002). **Training-induced apoptosis in skeletal muscle.** *Equine Veterinary Journal*(Suppl. 34): 275-278. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, training induced apoptosis, creatine kinase, DNA fragmenting or laddering, enzyme, skeletal muscle, treadmill training program, training-induced increases in fitness.

Notes: Meeting Information: 6th International Conference on Equine Exercise Physiology, Lexington, Kentucky, USA; 22-28 September 2002.

Boyde, A. and E.C. Firth (2005). **Musculoskeletal responses of 2-year-old Thoroughbred horses to early training. 8. Quantitative back-scattered electron scanning electron microscopy and confocal fluorescence microscopy of the epiphysis of the third metacarpal bone.** *New Zealand Veterinary Journal* 53(2): 123-132. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Descriptors: horses, computerised tomography, effects of training, racehorses, bone density.

Brama, P.A.J., R.A. Bank, J.M. Tekoppele, and P.R. Van Weeren (2001). **Training affects the collagen framework of subchondral bone in foals.** *Equine Veterinary Journal* 162(1): 24-32. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, foals, effects of training, bone characteristics.

Buchholz Bryant, M.A., L.A. Baker, J.L. Pipkin, B.J. Mansell, J.C. Haliburton, and R.C. Bachman (2001). **The effect of calcium and phosphorus supplementation, inactivity and subsequent aerobic training on the mineral balance in young, mature, and aged horses.** *Journal of Equine Veterinary Science* 21(2): 71-77. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, calcium, phosphorus, supplementary feeding, mineral metabolism, nutrient balance, physical activity, training of animals, age differences, digestibility, time, urine, feces, blood serum.

Buhl, R., A.K. Ersboll, L. Eriksen, and J. Koch (2005). **Changes over time in echocardiographic measurements in young Standardbred racehorses undergoing training and racing and association with racing performance.** *Journal of the American Veterinary Medical Association* 226(11): 1881-1887. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: horses, racehorses, training, performance, cardiovascular response, echocardiography.

Christley, R.M., D.R. Hodgson, D.L. Evans, and R.J. Rose (1997). **Effects of training on the development of exercise-induced arterial hypoxemia in horses.** *American Journal of Veterinary Research* 58(6): 653-657. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, training, arterial hypoxemia.

Cohen, N.D., S.M. Berry, J.G. Peloso, G.D. Mundy, and I.C. Howard (2000). **Association of high-speed exercise with racing injury in Thoroughbreds.** *Journal of the American Veterinary Medical Association* 216(8): 1273-1278. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: racing, Thoroughbreds, musculoskeletal injury.

Notes: Meeting Information: AVMA Animal Welfare Forum: Equine Welfare, 8 December 1999, Albuquerque, New Mexico.

Colahan, P.T., C. Kollias Baker, C.M. Leutenegger, and J.H. Jones (2002). **Does training affect mRNA transciption for cytokine production in circulating leucocytes?** *Equine Veterinary Journal*(Suppl. 34): 154-158. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, cytokine production stimulated by physical exertion, mRNA, leukocytes, training, leukocyte cytokine responses, training program, Thoroughbreds.

Notes: Meeting Information: 6th International Conference on Equine Exercise Physiology, Lexington, Kentucky, USA; 22-28 September 2002.

Cotta, T. and M.I.C. Ferreira (1995). **Effects of athletic training on lactate levels, cardiac output and hematocrit of the eventing horses.** *Arquivo Brasileiro De Medicina Veterinaria e Zootecnia* 47(3): 315-327.

Descriptors: horses, training, eventing, physiological effects, cardiac effects.

Cottin, F., C. Medigue, P. Lopes, E. Petit, Y. Papelier, and V.L. Billat (2005). **Effect of exercise intensity and repetition on heart rate variability during training in elite trotting horse.** *International Journal of Sports Medicine* 26(10): 859-67.

Abstract: RR intervals of ten elite trotting horses were recorded during an interval training session performed on track. This study examined two hypotheses. Firstly, like in humans, the hyperpnea combined with a decrease in cardiac autonomic control on heart rate during heavy exercise could result in a prevalence of high frequency heart rate variability. Secondly, this prevalence could increase with the heavy exercise repetition. Two exercise intensities were compared: moderate (ME) and heavy (HE). Furthermore, heavy exercise repetitions were compared between the beginning and the end of the interval training session. When comparing ME and HE periods: heart rate was significantly lower (155 +/- 12 vs. 210 +/- 9 ms, $p < 0.001$), LF spectral energy (0.04 - 0.2 Hz) was significantly higher (ME: 6.94 +/- 4.80 and HE: 0.24 +/- 0.14 ms(2) . Hz (-1), $p < 0.001$) whereas HF (0.2 - 2 Hz) was significantly lower (ME: 7.09 +/- 2.24 and HE: 10.60 +/- 3.64 ms(2) . Hz (-1), $p < 0.05$). In relative terms, ME showed similar results in both LFn (LF/LF+HF) and HFn (HF/LF+HF) whereas HE showed a large prevalence of HFn energy compared to LFn ($p < 0.001$). The difference in LF/HF ratio between the two exercise conditions was significant (1.14 +/- 0.92 vs. 0.09 +/- 0.12, $p < 0.001$). Exercise repetition induced a significant increase in heart rate between the beginning and the end of the interval training session (207 +/- 10 beats . min (-1) vs. 212 +/- 9 beats . min (-1), $p < 0.001$) whereas LF energy decreases (1.54 +/- 1.65 vs. 0.32 +/- 0.24 ms(2) . Hz (-1), $p < 0.01$) and HF energy remained constant (10.79 +/- 4.10 vs. 10.40 +/- 3.35 ms(2) . Hz (-1), NS). This study confirmed the results observed in humans during heavy exercise conditions with a large prevalence of HF in contrast to LF, this prevalence increasing with exercise repetitions. The observed decrease in LF/HF ratio could provide an index of hyperpnea in horses during interval training.

Descriptors: trotting horses, interval training, exercise intensity, heart rate.

Courouge, A., M. Chretien, and J.P. Valette (2002). **Physiological variables measured under field conditions according to age and state of training in French trotters.** *Equine Veterinary Journal* 34(1): 91-97. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, French trotters, effect of age, effect of training, physiological response.

Cury, L.J. (1997). **Training techniques of racehorses.** *Revista Brasileira De Reproducao Animal* 21(3): 146-151.

Descriptors: horses, racehorses, training methods.

Cygon, I. (2003). **Die natuerliche Pferdeaus-bildung - Der einfache Weg zum rittigen Pferd. [The natural horse training - the simple way to a rideable horse].** *Ganzheitliche Tiermedizin* 17(2): 53-55. ISSN: 0939-7868.

NAL Call Number: SF603.D48

Descriptors: horses, training techniques, natural training method.

Language of Text: German with an English summary.

D' Angelis, F.H.F., G.C. Ferraz, I.C. Boleli, J.C. Lacerda Neto, and A. Queiroz Neto (2005). **Aerobic training, but not creatine supplementation, alters the gluteus medius muscle.** *Journal of Animal Science* 83(3): 579-585.

ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, Arabian horses, creatine monohydrate, aerobic training, gluteus medius.

De D'Angelis, F.H., M.D.S. Da Mota, E.V.V. Freitas, G.C. De Ferraz, A.R. Abrahao, J.C. De Lacerda Neto, and A. De

Queiroz Neto (2005). **Ultra-sonografia do musculo longissimus dorsi de equinos da raca Puro-sangue Arabe em treinamento de resistencia associado a suplementacao prolongada com creatina.** [Ultrasonography images of the longissimus dorsi muscle of Arabian horses in endurance training associated to chronically supplemented with creatine]. *Revista Brasileira De Ciencia Veterinaria* 12(1/3): 142-146. ISSN: 1413-0130.

Descriptors: Arab, conditioning, creatine, fat thickness, feed supplements, height, lactic acid, longissimus dorsi, muscular hypertrophy, training of animals, ultrasonography, horses.

Language of Text: Portuguese with an English summary.

De Nogueira, G., R.C. Barnabe, J.C. Bedran de Castro, A.F. Moreira, W.R. Fernandes, R.M.S. Mirandola, and D.L. Howard (2002). **Serum cortisol, lactate and creatinine concentrations in Thoroughbred fillies of different ages and states of training.** *Brazilian Journal of Veterinary Research and Animal Science* 39(1/6): 54-57. ISSN: 1413-9596.

Descriptors: horses, exercise, training, creatinine, serum lactate concentration, cortisol levels, age variation, training level variation.

Language of Text: English with a Portuguese summary.

Diehl, N.K. (2005). **Review of research on the effectiveness of early intensive handling of foals.** In: *Proceedings of the Annual Convention of American Association of Equine Practitioners, December 3, 2005-December 7, 2005, Seattle, Washington*, Vol. 51, p. 239-245.

NAL Call Number: SF601.A46

Descriptors: animal handling, training animals, neonates, maternal behavior.

Dietl, G., S. Hoffmann, and N. Reinsch (2005). **Impact of trainer and judges in the mare performance test of warmblood horses.** *Archiv Fuer Tierzucht* 48(2): 113-120. ISSN: 0003-9438.

NAL Call Number: 49 AR23

Descriptors: horses, mares, genetics, heritability, rider, trainer, performance.

Duhaze, T. (2005). **Dressage utile du cheval.** [Useful training of horses]. *Equ'Idee*(52): 26-29. ISSN: 1162-8103.

Online: <http://www.haras-nationaux.fr>

Descriptors: animal behavior, training of animals, horses.

Language of Text: French.

Notes: Describes the training of horses, including techniques used for training horses, assessment and analysis of training.

Dyke, T.M., R.A. Sams, and K.W. Hinchcliff (1998). **Exercise-training-induced alterations in hepatic function in mares.** *Journal of Applied Physiology* 85(4): 1442-1447. ISSN: 8750-7587.

NAL Call Number: 447.8 J825

Descriptors: horses, mares, training, hepatic function.

Elsaesser, F., F. Klobasa, and F. Ellendorff (2001). **Acth stimulationstest und bestimmung von cortisol im blut und speichel zur bewertung des trainings-zustands/der kondition beim warmblutpferd.** [Evaluation of salivary cortisol determination and of cortisol responses to act as markers of the training status/fitness of warmblood sports horses]. *Deutsche Tierarztliche Wochenschrift* 108(1): 31-36. ISSN: 0341-6593.

NAL Call Number: 41.8 D482

Descriptors: horses, training, cortisol response, salivary cortisol.

Language of Text: German.

Escribano, B.M., F.M. Castejon, R. Vivo, R. Santisteban, E.I. Aguera, and M.D. Rubio (2005). **Effects of training on phagocytic and oxidative metabolism of peripheral neutrophils in horses exercised in the aerobic-anaerobic transition area.** *Veterinary Research Communications* 29(2): 149-158. ISSN: 0165-7380.

NAL Call Number: SF601.V38

Descriptors: horses, neutrophil function, phagocytosis, oxidative metabolism, aerobic exercise, anaerobic exercise, training.

- Eto, D., S. Yamano, K. Mukai, T. Sugiura, T. Nasu, M. Tokuriki, and H. Miyata (2004). **Effect of high intensity training on anaerobic capacity of middle gluteal muscle in Thoroughbred horses.** *Research in Veterinary Science* 76(2): 139-144. ISSN: 0034-5288.
NAL Call Number: 41.8 R312
Descriptors: horses, training, gluteal muscle, anaerobic activity.
- Evans, D.L. (2002). **Welfare of the racehorse during exercise training and racing.** In: N. Waran (Editor), *The Welfare of Horses*, Animal Welfare, Kluwer Academic Publishers: Dordrecht, Netherlands, p. 181-201. ISBN: 1402007663.
NAL Call Number: SF285.3.W43 2002
Descriptors: management practices, racehorses, lameness, animal welfare, environmental risk factors, fatigue, effects of excessive training and inadequate recovery periods, fluid balance.
- Evans, D.L. (2000). **Adaptations to training and overtraining in the racehorse.** *Asian Australasian Journal of Animal Sciences* 13(Suppl. Vol. C): 389-390.
Descriptors: horses, racehorses, training, physiological response.
Notes: Meeting Information: 9th Congress of the Asian-Australasian Association of Animal Production Societies and the 23rd Biennial Conference of the Australian Society of Animal Production Count, Sydney, New South Wales, Australia; July 03-07, 2000.
- Fan, Y.K., J.C. Hsu, H.C. Peh, C.L. Tsang, S.P. Cheng, S.C. Chiu, and J.C. Ju (2002). **The effects of endurance training on the hemogram of the horse.** *Asian Australasian Journal of Animal Sciences* 15(9): 1348-1353.
Descriptors: horses, response to endurance training, hemograms.
- Ferrucci, F., E. Zucca, V. Di Fabio, C. Croci, and F. Tradati (2002). **Rilievi gastroscopici in 63 cavalli trottatori in allenamento (Lombardia). [Gastroscopic findings in 63 Standardbred racehorses in training (Lombardy)].** *Atti Della Societa' Italiana Delle Scienze Veterinarie* 56: 261-262. ISSN: 0518-3588.
Abstract: 63 Standardbred horses in training with variable clinical signs, ranging from poor performance to poor body condition and recurrent abdominal discomfort, underwent endoscopic examination of the oesophagus, stomach and proximal duodenum. 59 horses (93.6%) had endoscopic evidence of ulcerative lesions of the nonglandular mucosa of the stomach, which were classified, according to MacAllister et al. (1997), from grade 0 to grade 5 for severity. Most horses had lesions ranging in severity from grade 3 to grade 5. This study confirms the high prevalence of gastric lesions in Standardbred racehorses, in agreement with what has been reported for Thoroughbred racehorses, suggesting a similar influence of management factors predisposing to ulcer development.
Descriptors: Standardbred racehorses, disease surveys, stomach ulcers, endoscopy, feeding systems, management factors may predispose horses to ulcer development, gastrointestinal disorders.
Language of Text: Italian.
- Firth, E.C. and C.W. Rogers (2005). **Musculoskeletal responses of 2-year-old Thoroughbred horses to early training. 7. Bone and articular cartilage response in the carpus.** *New Zealand Veterinary Journal* 53(2): 113-122. ISSN: 0048-0169.
NAL Call Number: 41.8 N483
Descriptors: horses, early training, carpus, hyaline cartilage, calcified cartilage, bone morphology, bone density.
- Firth, E.C. and C.W. Rogers (2005). **Musculoskeletal responses of 2-year-old Thoroughbred horses to early training. Conclusions.** *New Zealand Veterinary Journal* 53(6): 377-383. ISSN: 0048-0169.
Descriptors: abnormalities, bone density, bones, cartilage, collagen, joint diseases, joints animal, muscles, musculoskeletal system, racehorses, skeleton, tendons, Thoroughbred, training of animals, horses.
- Firth, E.C., C.W. Rogers, and B.H. Anderson (2004). **Musculoskeletal responses of 2-year-old Thoroughbred horses to early training. 4. Morphometric, microscopic and biomechanical properties of the digital tendons of the forelimb.** *New Zealand Veterinary Journal* 52(5): 285-292. ISSN: 0048-0169.
NAL Call Number: 41.8 N483

Descriptors: horses, racehorses, Thoroughbreds, early training, suspensory ligament, common digital extensor tendon, digital flexor tendon.

Firth, E.C., C.W. Rogers, M. Doube, and N.B. Jopson (2005). **Musculoskeletal responses of 2-year-old Thoroughbred horses to early training. 6. Bone parameters in the third metacarpal and third metatarsal bones.** *New Zealand Veterinary Journal* 53(2): 101-112. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Descriptors: horses, racehorses, Thoroughbreds, training protocol, metacarpal, metatarsal.

Firth, E.C., C.W. Rogers, N.R. Perkins, B.H. Anderson, and N.D. Grace (2004). **Musculoskeletal responses of 2-year-old Thoroughbred horses to early training. 1. Study design, and clinical, nutritional, radiological and histological observations.** *New Zealand Veterinary Journal* 52(5): 261-271. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Abstract: AIMS: This is the first in a series of papers reporting studies in 2-year-old Thoroughbred racehorses that aimed to determine the response of musculoskeletal tissues to early training on grass and sand racetracks. In this paper, the experimental set-up of the whole study is described, and nutritional, workload, and clinical, radiographic and pathological outcomes are reported, including semi-quantitative assessment of macroscopic changes in articular cartilage. METHODS: The study group comprised 14 two-year-old Thoroughbred fillies reared entirely at pasture. Of these, seven were selected by a licensed racehorse trainer to undergo a 4-week period of initial training in which they were taught to accept saddle and rider, followed by a 13-week period of flatrace training at a racetrack (Weeks 1-13); the other seven fillies were confined to large grass enclosures and were not trained. Nutrient, including macro- and trace-element intakes were estimated. Distances cantered or galloped and average velocities were quantified for the trained horses. All horses were observed daily, weighed approximately weekly, and underwent a clinical lameness examination at Weeks 5, 9 and 13. Distal forelimbs were radiographed prior to Week 1, during Weeks 7-8, and again at the end of the study, when macroscopic changes in articular cartilage of the proximal surface of the proximal phalanx were also scored after staining with India ink. RESULTS: Dietary intakes met or exceeded recommended requirements for all nutrients except sodium, which was low in the trained horses. Bodyweight increased throughout the study in the untrained horses, and increased until Week 7 and then decreased slightly in the trained horses. Mean velocity data were used to define three stages of the training programme: Stage 1 comprised canter in Weeks 1-4; Stage 2 comprised canter in Weeks 5-8; and Stage 3 comprised canter in Weeks 9-13 and galloping twice weekly. Four of seven horses completed training. These covered a mean distance of 179.2 km at mean velocities (excluding gallops) of 7.63 m/sec (SD 0.58), 8.99 m/sec (SD 0.56), and 8.43 m/sec (SD 0.74) for Stages 1-3, respectively, and galloped 4.45 km at 14.4 (SD 0.1) m/sec. The three horses that did not complete training became lame in Weeks 9, 10 and 11, and covered 147.9 km at velocities of 7.38 m/sec (SD 0.44), 8.88 m/sec (SD 0.33) and 8.43 m/sec (SD 0.59) and galloped 2.1 km. Overall, slight or intermittent lameness in trained horses was noted on 76/655 (12%) of horse observation days. Swelling was evident on 284/655 (41%) of horse observation days in the metacarpophalangeal (MCPJ) and metatarsophalangeal (MTPJ) joints (92%), palmar metacarpal tendon region (7%) or carpus (1%). Swelling of the MCPJ or MTPJ was not associated with obvious lameness. Radiographic changes were minor and no gross lesions in bone or tendon tissue were evident except for one case of dorsal metacarpal disease. Post mortem, the cartilage of some MCPJ and MTPJ had obvious wear lines and high lesion scores, which were not consistently related to clinical evidence of pain, lameness or joint swelling. Mean lesion scores were not significantly different between the MCPJ and MTPJ, or between trained and untrained horses. CONCLUSIONS: Workload can be readily quantified in racehorses under semi-commercial training conditions. Obvious lesions in cartilage of the MCPJ or MTPJ were present in some trained and some untrained horses and not consistently associated with clinical evidence of lameness, joint swelling or change in other connective tissues. CLINICAL RELEVANCE: Workload data in racing horses are likely to be highly relevant for studying the pathogenesis of changes in bone, tendon and cartilage during training, for training management and for risk analysis in racehorse populations. Although obvious cartilage lesions produced little clinical effect, such lesions have previously been shown to be progressive and to prejudice athletic capability. Detection of such occult lesions in young horses will require more sophisticated detection methods.

Descriptors: horses, effects of early training, musculoskeletal system, workload determination, Thoroughbreds, racehorses, training on grass and sand, 2 year old horses.

- Galloux, P. (2003). **Development of the training method in three-day-event horses.** In: *The Elite Dressage and Three Day Event Horse: Conference on Equine Sports Medicine and Science 2002, October 19, 2002-October 21, 2002, Saumur, France*, Arbeitsgruppe Pferd.: Essen, Germany, p. 55-60.
Descriptors: training methods for performance horses, three-day events, physiology, horse health, athletic development, mental development, horse-rider relationship.
- Gehlen, H., S. Marnette, K. Rohn, L. Kreienbrock, and P. Stadler (2005). **Prazisionskontrolle echokardiographischer links-ventrikularer funktionsparameter durch wiederholte messungen an drei aufeinanderfolgenden tagen bei trainierten und trainierten warmblutpferden.** [Day to day variability of left ventricular echocardiographic parameters by repeated measurement at 3 days in trained and untrained warmblood horses]. *Deutsche Tieraerztliche Wochenschrift* 112(2): 48-54. ISSN: 0341-6593.
Descriptors: cardiovascular system, transport and circulation, methods and techniques, veterinary medicine, random effects model, mathematical and computer techniques, left ventricular echocardiography, laboratory techniques, imaging and microscopy techniques, day to day variability.
Language of Text: German.
- Geor, R.J., L.J. McCutcheon, and Shen Hua (1999). **Muscular and metabolic responses to moderate-intensity short-term training.** *Equine Veterinary Journal*(Suppl. 30): 311-317. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, training response, muscle metabolism, oxygen consumption, gluteal muscle, epinephrine, blood chemistry, muscle glycogenolysis.
Notes: Meeting Information: Proceedings of the Fifth International Conference on Equine Exercise Physiology, Utsunomiya, Japan, 20-25 September 1998. *Equine Exercise Physiology* 5.
- Ghafir, Y., T. Art, and P. Lekeux (1996). **Infrared thermography in the study of thermoregulation in the horse: training effects.** *Annales De Medecine Veterinaire* 140(2): 131-135.
NAL Call Number: TRANSL 22570
Descriptors: horse, training response, thermoregulation, thermography.
- Greig, C.R., K.E. Brass, F.G. De Oliveira, F.D. De La Corte, J.H. Silva, and C.A.M. Silva (2005). **Relevancia da ultra-sonografia dos tendoes flexores em cavalos puro sangue de corrida na adaptacao ao treinamento.** [Significance of flexor tendon ultrasonography in training Thoroughbred horses]. *Ciencia Rural* 35(4): 832-836. ISSN: 0103-8478.
NAL Call Number: S192.R4
Descriptors: horses, Thoroughbreds, ultrasonograph, superficial digital flexor tendon, deep digital flexor tendon, tendon cross sectional area, effects of exercise, training techniques.
Language of Text: Portuguese.
- Halo, M., M. Valent, and P. Cupka (1995). **Metabolic characteristics of race horses during the training process.** In: *Book of Abstracts of the Annual Meeting of the European Association for Animal Production, September 4-7 (1995), Prague, Czech Republic*, Wageningen Pers: Wageningen, Netherlands, p. 344. ISBN: 9074134246.
Descriptors: horses, racehorses, training, training management, metabolism, training response.
- Halo, M., M. Valent, P. Cupka, and P. Kalas (1996). **Sledovanie dusikoveho a pecenoveho profilu dostihovych koni v treningovom procese.** [Monitoring nitrogen and liver profile of race horses in training process]. *Acta Zootechnica* 51: 111-114. ISSN: 1335-258X.
NAL Call Number: S13.A28
Abstract: Effect of training including training and resting periods in a group of seven race horses on nitrogen level and liver profile was investigated. The training process was divided into four parts. 1 - the end of racing season, 2 - the end of the resting period, 3 - the end of quantitative training and 4 - the end of qualitative training. Level of urea in blood serum was within the reference limits, with a tendency towards increased values in the 1st and the 2nd period (5.07 - 5.79 mmol l** (-1)). The average values of global protein, AST, ALT and bilirubin varied within the reference levels in the first two periods. In the 3rd and 4th periods the level of global protein, AST and bilirubine increased significantly in comparison with the 1st and 2nd period of the training

process.

Descriptors: racehorses, nitrogen metabolism, blood serum, liver, bilirubin, biochemical reactions, nitrogen levels, effects of training, resting periods.

Language of Text: Slovak with an English summary.

Halo, M., M. Valent, J. Cupka, and P. Kalas (1996). **Sledovanie dusikoveho a pecenoveho profilu dostihovych koni v treningovom procese. [Nitrogen and liver profile of race horses during training].** *Acta Zootechnica* 51: 111-114. ISSN: 1335-258X.

NAL Call Number: S13.A28

Descriptors: horses, racehorses, nutrition, metabolism of nitrogen, training, serum nitrogen, bilirubin, liver enzyme activity.

Language of Text: Slovak with an English summary.

Haney, E., G.D. Potter, P.G. Gibbs, and C. Rammerstorfer (1997). **Physiologic responses to a standardized exercise test in reining horses trained by conventional and interval procedures.** In: *Proceedings of the Fifteenth Equine Nutrition and Physiology Symposium, May 28, 1997-May 31, 1997, Fort Worth, Texas, USA*, Equine Nutrition & Physiology Society Publications: Savoy, USA, p. 45-50.

Descriptors: reining horses, horse health, training methods, exercise tests, interval training.

Haouet, M.N., G. Martino, F. Poricello, F. Rueca, A. Spaterna, M.B. Conti, L. Avellini, M. Silvestrelli, and O. Olivieri (1995). **The effect of training on morphological and chemical blood parameters in maremma horses undergoing a performance test.** In: *Book of Abstracts of the Annual Meeting of the European Association for Animal Production, September 4, 1995-September 7, 1995, Prague, Czech Republic*, Wageningen Pers: Wageningen, Netherlands, p. 345. ISBN: 9074134246.

Descriptors: horses, training effects, blood chemistry, exercise, performance.

Harris, P.A., D.J. Marlin, and J. Gray (1998). **Plasma aspartate aminotransferase and creatine kinase activities in Thoroughbred racehorses in relation to age, sex, exercise and training.** *Veterinary Journal* 155(3): 295-304. ISSN: 1090-0233.

NAL Call Number: SF601.V484

Descriptors: horses, Thoroughbreds, training response, age variation, sex variation, fitness variation, plasma aspartate aminotransferase, creatine kinase.

Hebenbrock, M., M. Due, H. Holzhausen, A. Sass, P. Stadler, and F. Ellendorff (2005). **A new tool to monitor training and performance of sport horses using global positioning system (GPS) with integrated GSM capabilities.** *Deutsche Tierärztliche Wochenschrift* 112(7): 262-5.

Abstract: Global Positioning Systems (GPS) are considered suitable to monitor the position and velocity of horses during cross-country competition or in training. Furthermore, simultaneous recording of life data such as heart rate could be useful to assess the horse's condition during exercise. To test the suitability and reliability of a commercially available GPS system with integrated heart rate recording system and with built in GSM for data transmission, the Fidelak Equipilot Type EP-2003-15/G-2.11 (EP-15/G) was evaluated first for reliability of pulse recording from a pulse generator within the physiological range of horses; furthermore distance, velocity and heart rate recordings were carried out on a standard 1000 m field track with five repetitions. Agreement (% deviation from actually measured distance and from stopwatch-distance based velocity calculations) and variability (Coefficient of Variation for distance, velocity, heart rate) were calculated. From the results it was safe to assume that the heart rate sensor recorded horse heart rates at a high degree of accuracy. Overall distances and velocities are in high agreement with actually measured values. However, overall variability expressed in terms of relative variability (C.V.) is smaller for distance recording (C.V. 0.68%) when compared to velocity (C.V. 1.01%). The system tested is suitable and reliable for simultaneously recording of distance, velocity and heart rates for horses during cross country exercise. GPS-based monitoring of movement along with simultaneous recording of physiological data and the possibility to call upon data will not only be of benefit for training horses or for surveillance during competition, it may also be suitable for distant patient monitoring and in behavioural studies as well as in veterinary medicine in general.

Descriptors: usage of global positioning systems, GPS, reliability assessment, competition, training.

- Hernandez, J. and D.L. Hawkins (2001). **Training failure among yearling horses.** *American Journal of Veterinary Research* 62(9): 1418-1422. ISSN: 0002-9645.
NAL Call Number: 41.8 Am3A
Descriptors: horses, yearlings, early training, incidence of training difficulty.
- Hiney, K.M., B.D. Nielsen, and D. Rosenstein (2004). **Short-duration exercise and confinement alters bone mineral content and shape in weanling horses.** *Journal of Animal Science* 82(8): 2313-2320. ISSN: 0021-8812.
NAL Call Number: 49 J82
Descriptors: horses, weanlings, bone mass, housing, confinement, exercise protocol, skeletal strength, diagnostic techniques.
- Hintz, H.F. (1997). **Calcium requirements of young horses in training.** *Equine Practice* 19(8): 6-7. ISSN: 0162-8941.
NAL Call Number: SF951.E62
Descriptors: horses, early training, nutrition, calcium.
- Hiraga, A., M. Kai, K. Kubo, and B.K. Erickson (1995). **The effect of long slow distance training on aerobic work capacity in young Thoroughbred horses.** *Journal of Equine Science* 6(1): 1-6. ISSN: 1340-3516.
NAL Call Number: SF277.J37
Descriptors: horses, Thoroughbreds, training protocol, distance training, aerobic capacity.
- Hiraga, A., M. Kai, K. Kubo, and S. Sugano (1997). **The effect of training intensity on cardiopulmonary function in 2 year-old Thoroughbred horses.** *Journal of Equine Science* 8(3): 75-80. ISSN: 1340-3516.
NAL Call Number: SF277.J37
Descriptors: horses, Thoroughbreds, cardiac function, effects of training, exercise intensity variation.
- Holt, K.M. and M.C. Nicodemus (2003). **The influence of training on flat walking temporal variables of Tennessee Walking horse yearlings.** *Journal of Animal Science* 86(Suppl. 1): 262-263. ISSN: 0021-8812.
NAL Call Number: 49 J82
Descriptors: horses, Tennessee Walking horses, yearlings, training methods, temporal variables.
Notes: Meeting Information: Joint Annual Meeting of the American Dairy Science Association, the American Society of Animal Science and the Mexican Association of Animal Production, Phoenix, Arizona, USA; June 22-26, 2003.
- Islas, A., M. Quezada, A. Bernales, G. Mora, J.L. Lopez Rivero, V. Merino, P. Dossow, V. Rojas, and L. Marin (2000). **Características histoquímicas, morfométricas y metabólicas del músculo glúteo medius de equinos entrenados para competencias de salto. [Histochemical, morphometrical and metabolic characteristics of the gluteus medius muscle from horses in training for jumping competition].** *Archivos De Medicina Veterinaria* 32(1): 11-19. ISSN: 0301-732X.
Descriptors: horses, muscles, gluteus medius, training effects, jumping, fibrillar composition, evaluation techniques.
Language of Text: Spanish with an English summary.
- Janiszewska, J., J. Ignor, and A. Ciesla (2004). **Einfluss eines 11-monatigen Trainings auf die ergebnisse des "aengstlichkeitstests" von jungen halbblut-hengsten. [Modifying influence of 11-months training on results of 'timidity' test of young half bred stallions].** *Archiv Fuer Tierzucht* 47(1): 7-13. ISSN: 0003-9438.
NAL Call Number: 49 AR23
Descriptors: horses, stallions, behavior, training.
- Jonsson, H. and A. Egenvall (2006). **Prevalence of gastric ulceration in Swedish Standardbreds in race training.** *Equine Veterinary Journal* 38(3): 209-213. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: Standardbreds, race training, epidemiology, sex and age difference correlation, gastric ulcers.

- Kallweit, E., J. Dodenhoff, M. Steinhardt, H.H. Thielscher, C. Mueller, M. Henning, and J. Ladewig (1996). **Criteria to evaluate the state of training in horses.** *Zuechtungskunde* 68(4): 246-257.
Descriptors: horses, training, evaluation methods.
- Kapron, M. (2001). **Projekt modernizacji systemu wierzchowych prob dzielnosci ogierow pokrwi w Zakadach Treningowych.** [A plan for the modernization of the saddle performance testing system of half-bred stallions at training stations]. *Roczniki Naukowe Zootechniki*(Suppl. z. 14): 81-94. ISSN: 0137-1657.
NAL Call Number: SF1.R6
Descriptors: horses, stallions, performance evaluation methods, genetics.
Language of Text: Polish with an English summary.
- Kapron, M., I. Janczarek, M. Pluta, K. Bocian, and A. Suska (2001). **Wybrane wskaźniki zaawansowania treningowego ogierow pokrwi w ramach testu 100 dni.** [Selected indicators of training progress of half-bred stallions as part of the 100-day test]. *Roczniki Naukowe Zootechniki*(Supl. z. 14): 95-107. ISSN: 0137-1657.
NAL Call Number: SF1.R6
Descriptors: horses, stallions, training, heart rate, performance testing methods.
Language of Text: Polish with an English summary.
- Kapron, M., G. Zieba, K. Strzelec, A. Stachurska, H. Kapron, and I. Janczarek (1997). **Ocena zmienności poziomu odziedziczalności cech użytkowych ogierow pokrwi trenowanych w zakładach treningowych (1973-1992) z uwzględnieniem ich przynależności rasowej i wykorzystywanych metod statystycznych.** [Estimating the variation of heritability of performance traits in Halfbred stallions trained at specialized stations (1973-92) with regard to breed type and statistical methods]. *Zeszyty Naukowe Akademii Rolniczej w Szczecinie, Zootechnika* 35: 177-186. ISSN: 0137-1940.
NAL Call Number: 20.5 St43
Descriptors: horses, stallions, performance testing, statistical methods, variance analysis, evaluation methods.
Language of Text: Polish with an English summary.
- Kasashima, Y., D. Eto, K. Kusano, S. Hobo, and Japan Tendinitis Researching Project Team (2001). **Comparison of the method of cold therapy to equine limbs after training, with the aim of preventing tendinitis.** *Journal of Equine Science* 12(3): 96. ISSN: 1340-3516.
NAL Call Number: SF277.J37
Descriptors: horses, training, exercise, tendinitis prevention, cold therapy methods, meeting abstract.
Notes: Meeting Information: 42nd Annual Meeting of Investigation and Research Concerning the Racehorses. Part II. Kudan Kaikan, Tokyo, Japan; 5-6 December, 2000.
- Katz, L.M., W.M. Bayly, M.J. Roeder, J.K. Kingston, and M.T. Hines (2000). **Effects of training on maximum oxygen consumption of ponies.** *American Journal of Veterinary Research* 61(8): 986-991. ISSN: 0002-9645.
NAL Call Number: 41.8 Am3A
Descriptors: ponies, training, oxygen consumption.
- Kedzierski, W. and M. Podolak (2002). **Wpływ treningu koni rasy arabskiej na poziom parametrów biochemicznych związanych z gospodarką węglowodanowo-lipidową.** [Training arabian horses and its effect on the level of biochemical indices related to the metabolism of carbohydrate and lipids]. *Medycyna Weterynaryjna* 58(10): 788-791. ISSN: 0025-8628.
NAL Call Number: 41.8 M463
Descriptors: horses, Arabian horses, nutrition, effects of training, carbohydrate metabolism, lipid metabolism.
Language of Text: Polish.
- Kim, J.S., K.W. Hinchcliff, M. Yamaguchi, L.A. Beard, C.D. Markert, and S.T. Devor (2005). **Exercise training increases oxidative capacity and attenuates exercise-induced ultrastructural damage in skeletal muscle of aged horses.** *Journal of Applied Physiology* 98(1): 334-342. ISSN: 8750-7587.
NAL Call Number: 447.8 J825

Descriptors: horses, exercise, training, effect of age, muscle damage, skeletal muscle, endurance, enzymes.

Kim, J.S., K.W. Hinchcliff, M. Yamaguchi, L.A. Beard, C.D. Markert, and S.T. Devor (2005). **Exercise training increases oxidative capacity and attenuates exercise-induced ultrastructural damage in skeletal muscle of aged horses.** *Journal of Applied Physiology* 98(1): 334-42.

Abstract: Exercise training improves functional capacity in aged individuals. Whether such training reduces the severity of exercise-induced muscle damage is unknown. The purpose of the present study was to determine the effect of 10 wk of treadmill exercise training on skeletal muscle oxidative capacity and exercise-induced ultrastructural damage in six aged female Quarter horses (>23 yr of age). The magnitude of ultrastructural muscle damage induced by an incremental exercise test before and after training was determined by electron microscopic examination of samples of triceps, semimembranosus, and masseter (control) muscles. Maximal aerobic capacity increased 22% after 10 wk of exercise training. The percentage of type IIa myosin heavy chain increased in semimembranosus muscle, whereas the percentage of type IIx myosin heavy chain decreased in triceps muscle. After training, triceps muscle showed significant increases in activities of both citrate synthase and 3-hydroxyacyl-CoA-dehydrogenase. Attenuation of exercise-induced ultrastructural muscle damage occurred in the semimembranosus muscle at both the same absolute and the same relative workloads after the 10-wk conditioning period. We conclude that aged horses adapt readily to intense aerobic exercise training with improvements in endurance, whole body aerobic capacity, and muscle oxidative capacity, and heightened resistance to exercise-induced ultrastructural muscle cell damage. However, adaptations may be muscle-group specific.

Descriptors: aged horses, training adaptation, exercise training, muscle damage, treadmill exercise, skeletal muscle oxidative capacity, endurance, whole body aerobic capacity.

Knudsen, D.M. and P.F. Joergensen (2000). **Svoemmetraening af heste sammenlignet med trav- og ridetraening: Vurdering af traeningsintensitet paa grundlag af kredsloeb- og syre-base parametre. [Swimming training of horses compared to trotting and dressage: evaluation of training intensity based on parameters for the cardiovascular system and lactate production].** *Dansk Veterinaertidsskrift* 83(23): 6-10. ISSN: 0106-6854.

NAL Call Number: 41.9 D23

Descriptors: racehorses, animal training, alternative methods of training, training intensity, physical activity, acid base equilibrium, lactate production, cardiovascular system, swimming.

Language of Text: Danish.

Kobayashi, M., K. Kuribara, and A. Amada (1999). **Application of V200 values for evaluation of training effects in the young Thoroughbred under field conditions.** *Equine Veterinary Journal*(Suppl. 30): 159-162. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, Thoroughbreds, training, incremental exercise test, evaluation techniques for training effects.

Notes: Meeting Information: Proceedings of the Fifth International Conference on Equine Exercise Physiology, Utsunomiya, Japan, 20-25 September 1998. *Equine Exercise Physiology* 5.

Kraft, U.I., and F.I. Kraft (Inventors) (2005). **Free-reign walking machine for training animals along a defined training course.** (US 06871615, March 29, 2005). *Official Gazette of the United States Patent and Trademark Office Patents*. ISSN: 0098-1133.

Online: <http://www.uspto.gov/patft/index.html>

Descriptors: equipment apparatus devices and instrumentation, animal husbandry, agriculture, free reign walking machine, field equipment.

Krueger, K. (2007). **Behaviour of horses in the "round pen technique".** *Applied Animal Behaviour Science*. 106(1-3): 184-189. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: round pen, horse whisperers, horse behavior, training, learning, following in pen did not translate to following in pasture, dominance relationship.

- Kusunose, R. and A. Yamanobe (2002). **The effect of training schedule on learned tasks in yearling horses.** *Applied Animal Behaviour Science* 78(2/4): 225-233. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: horses, young animals, Thoroughbreds, training of animals, frequency, duration, heart rate, learning, horse riding, saddles, equipment, accuracy.
Notes: In the special issue: *Equine Behavior* edited by K. Houpt and R. Rudman.
- Lakritz, J., E.R. Wisner, T. Finucane, T.R. O'Brien, W.S. Tyler, J.R. Pascoe, and C.G. Plopper (1995). **Morphologic and morphometric characterization of lung collagen content in clinically normal adult Thoroughbreds in race training.** *American Journal of Veterinary Research* 56(1): 11-18. ISSN: 0002-9645.
NAL Call Number: 41.8 Am3A
Descriptors: horses, racehorses, Thoroughbreds, respiratory system, lung collagen, training effects.
- Lange, J., S. Matheja, E. Klug, C. Aurich, and J.E. Aurich (1997). **Influence of training and competition on the endocrine regulation of testicular function and on semen parameters in stallions.** *Reproduction in Domestic Animals* 32(6): 297-302. ISSN: 0936-6768.
NAL Call Number: SF105.A1Z8
Descriptors: horses, stallions, endocrine system, effects of training, performance, reproductive system, testicular function, semen production.
- Lansade, L., M. Bertrand, X. Boivin, and M.F. Bouissou (2004). **Effects of handling at weaning on manageability and reactivity of foals.** *Applied Animal Behaviour Science* 87(1-2): 131-149. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: temperatment, early experiences, handling of young horses, Anglo-Arab, foals, weaning, optimal period for handling.
- Lansade, L., M. Bertrand, and M.F. Bouissou (2005). **Effects of neonatal handling on subsequent manageability, reactivity and learning ability of foals.** *Applied Animal Behaviour Science* 92(1-2): 143-158. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: horse breeds, training animals, animal age, animal behavior, learning, human animal relations, Welsh Pony horse breed.
- Larsdotter, S., L. Holm, K. Dahlborn, A. Jansson, M. Josefsson, and Y. Ridderstrale (2002). **Carbonic anhydrase activity and sweat gland morphology in trained and untrained Standardbred trotters.** *Equine Veterinary Journal*(Suppl. 34): 560-563. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, Standardbreds, exercise, training stages, morphology of sweat glands, carbonic anhydrase, light microscopic image analysis method.
Notes: Meeting Information: 6th International Conference on Equine Exercise Physiology, Lexington, Kentucky, USA; 22-28 September 2002.
- Lewczuk, D. (2000). **Zastosowanie komputerowej analizy obrazu w ocenie zdolnosci skokowych koni pokrwi w zakadach treningowych. [The usefulness of video image analysis in prediction of halfbred horse jumping skills in young stallion's training centres].** *Folia Universitatis Agriculturae Stetinensis, Zootechnica*(40): 91-98. ISSN: 1506-1698.
Descriptors: horses, jumping performance prediction, genetics, video image analysis.
Language of Text: Polish with an English summary.
- Lightowler, C., G. Pidal, G. Romei del Olmo, G. Piccione, E. Giudice, and M. Cattaneo (2002). **Use dell' ecocardiografia per valutare i cambiamenti cardiaci indotti dall' attivita' fisica nel cavallo. [Using echocardiography to evaluate cardiac changes induced by training in the horse].** *Archivio Veterinario Italiano* 53(1-2): 53-61. ISSN: 0004-0479.
Abstract: The AA carried out an echocardiographic study of the cardiac changes resulting by different training

protocols in horses. 42 clinically healthy horses, not previously trained, were divided in 2 groups and underwent different training programs (endurance and speed training). 3 echographs were used to assess the following echocardiographic parameters: Left Ventricular Diastolic Diameter (LVDD), Left Ventricular Myocardial Mass (LVMM), Left Ventricular Diastolic Volume (LVDV), Relative Wall Thickness (RWT) and Left Ventricular Diastolic Volume/Left Ventricular Myocardial Mass ratio (LVDV/LVMM). The endurance-trained horses showed increases in LVDD (16.06%), LVDV (22.82%) and LVMM (32.54%) values, while RWT and LVDV/LVMM ratio were constant. In speed-trained horses LVDD and LVDV values were unchanged (0.062 and 0.25%, respectively), LVMM and RWT raised (26.40 and 19.40%, respectively), while LVDV/LVMM ratio decreased (21.37%).

Descriptors: echocardiography, animal physiology and performance, effect of training on cardiovascular system, heart rate, echography, blood circulation.

Language of Text: Italian.

Luis, E.S., N. Hernandez, and S. Hecker Torres (1999). **Efecto del entrenamiento sobre actividades enzimáticas y composición fibrilar en el M.G. medius de caballos pura sangre Venezolanos.** [Effect of training on enzyme activities and fibrillar composition in the M.G. medius of Venezuelan Thoroughbreds]. *Revista Científica, Facultad De Ciencias Veterinarias, Universidad Del Zulia* 9(6): 489-501.

Descriptors: horses, muscles, effects of training, oxidative capacity of muscle fibers, enzyme activity, muscle fiber area, capillary density, aerobic capacity.

Language of Text: Spanish with an English summary.

Mal, M.E. and C.A. McCall (1996). **The influence of handling during different ages on a halter training test in foals.** *Applied Animal Behaviour Science* 50(2): 115-120. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, foals, age variation, effects of handling, training.

Malinowski, K., C.F. Kearns, P.D. Guirnalda, V. Roegner, and K.H. McKeever (2004). **Effect of chronic clenbuterol administration and exercise training on immune function in horses.** *Journal of Animal Science* 82(12): 3500-3507. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, racehorses, Standardbreds, race training, immune function, clenbuterol, inflammatory airway disease management.

Malinowski, K., E. Shock, V. Roegner, P. Rochelle, C.F. Kearns, P.D. Guirnalda, and K.H. McKeever (2002). **Age and exercise training alter plasma beta-endorphin, cortisol, and immune parameters in horses.** *Journal of Animal Science* 85(Suppl. 1): 156. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, age variation, exercise, training stages, plasma beta-endorphin, cortisol, immune system.

Notes: Meeting Information: Meeting of the American Society of Animal Science and the American Dairy Science Association, Quebec City, Quebec, Canada; July 20-25, 2002.

Mansell, B.J., L.A. Baker, J.L. Pipkin, G.D. Potter, R.C. Bachman, L.J. Perino, G.O. Veneklasen, J.C. Haliburton, and M.A. Buchholz Bryant (2001). **The effect of calcium and phosphorus supplementation on bone metabolism in young, mature, and aged horses during inactivity and subsequent aerobic training.** *Journal of Equine Veterinary Science* 21(9): 445-450. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, calcium, phosphorus, supplementary feeding, bone density, metabolism, bones, young animals, exercise.

Marc, M., N. Parvizi, F. Ellendorff, E. Kallweit, and F. Elsaesser (2000). **Plasma cortisol and ACTH concentrations in the warmblood horse in response to a standardized treadmill exercise test as physiological markers for evaluation of training status.** *Journal of Animal Science* 78(7): 1936-1946. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, blood chemistry, exercise, training, evaluation methods, physiological evaluation.

- Martin Jr., B.B., V.B. Reef, E.J. Parente, and A.D. Sage (1999). **Clinical evaluation of poor training or racing performance in 348 horses (1992-1996)**. In: *Proceedings of the 45th Annual Convention of the American Association of Equine Practitioners, December 5, 1999-December 8, 1999, Albuquerque, New Mexico*, American Association of Equine Practitioners (AAEP): Lexington, Kentucky, USA, p. 322-324.
Descriptors: racehorses, training, performance analysis, upper respiratory tract abnormalities, laryngeal hemiplegia, cardiac disease, lameness, electrocardiography, tread mills.
- McClure, S.R., D.S. Carithers, S.J. Gross, and M.J. Murray (2005). **Gastric ulcer development in horses in a simulated show or training environment**. *Journal of the American Veterinary Medical Association* 227(5): 775-777. ISSN: 0003-1488.
NAL Call Number: 41.8 Am3
Descriptors: horses, transport, competition, confinement, exercise, stress, gastric ulcer causation, management practices.
- McCutcheon, L.J. and R.J. Geor (2000). **Influence of training on sweating responses during submaximal exercise in horses**. *Journal of Applied Physiology* 89(6): 2463-2471. ISSN: 8750-7587.
NAL Call Number: 447.8 J825
Descriptors: horses, physiology, exercise, effects of training, sweat response.
- McCutcheon, L.J., R.J. Geor, and Shen Hua (1999). **Skeletal muscle Na⁺-K⁺-ATPase and K⁺ homeostasis during exercise: effects of short-term training**. *Equine Veterinary Journal*(Suppl. 30): 303-310. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, racehorses, training, exercise, gluteal muscle, plasma, potassium regulation, oxygen consumption, adenosinetriphosphatase.
Notes: Meeting Information: Proceedings of the Fifth International Conference on Equine Exercise Physiology, Utsunomiya, Japan, 20-25 September 1998. *Equine Exercise Physiology* 5.
- McIlwraith, C.W. (2001). **What are we doing to prevent severe injury in the equine athlete in training**. *Proceedings of the North American Veterinary Conference* 15: 118-119.
NAL Call Number: SF605.N672
Descriptors: horses, joint diseases, bone diseases, bone fractures, diagnostic techniques, radiography, computed tomography, imagery, scintigraphy, synovial fluid, serum, Colorado, magnetic resonance imaging, 3-D computed tomography, subchondral bone disease, serum markers, joint modeling, optical coherence tomography.
Notes: Meeting Information: Meeting held January 13-17, 2001 in Orlando, Florida. In the volume: *Large Animal*. Part of a three volume set.
- McKeever, K.H., R. Scali, S. Geiser, J.M. Agans, P.D. Guirnalda, C.F. Kearns, and A.N. Dimock (1999). **Training-induced alterations in renal function in horses**. *Medicine and Science in Sports and Exercise* 31(5 Suppl.): S323.
Descriptors: horses, effects of training, renal function.
Notes: Meeting Information: 46th Annual Meeting of the American College of Sports Medicine, Washington, D.C., USA; June 2-5, 1999.
- McKeever, K.H., A.M. Szucsik, V.B. Balaskonis, C.L. Betros, C.F. Kearns, and K. Malinowski (2002). **Effect of management practices and training on plasma tCO₂ concentration in horses**. *Journal of Dairy Science* 85(Suppl. 1): 172. ISSN: 0022-0302.
NAL Call Number: 44.8 J822
Descriptors: horses, metabolism, training, exercise, management techniques, CO₂ levels, meeting abstracts.
Notes: Meeting Information: Meeting of the American Society of Animal Science and the American Dairy Science Association, Quebec City, Quebec, Canada; July 20-25, 2002.
- Medica, P., E. Fazio, A. Ferlazzo, D. Alberghina, and S.J. Wickler (2002). **Effetto dell' allenamento sulla risposta di cortisolo e iodotironine totali e libere di cavalli a test d' esercizio standardizzati su treadmill**. [Effect of

training on response of circulating cortisol and total and free iodothyronine levels of horses to standardized exercise tests on treadmill]. *Atti Della Societa' Italiana Delle Scienze Veterinarie* 56: 83-84. ISSN: 0518-3588.

Abstract: Adrenocortical and thyroid responses of horses were evaluated after Standardized Exercise Tests (SET) during a training protocol of two months. A significant increase of circulating cortisol and free triiodothyronine levels 5 and 15 min after SET was detected. A significant effect of training on total tiroxine levels was recorded.

Descriptors: treadmill exercise tests, horses, effects of training, iodothyronine, blood plasma levels of cortisol, glucocorticoids, physical activity.

Language of Text: Italian.

Miller, R.M. (2001). **Fallacious studies of foal imprint training.** *Journal of Equine Veterinary Science* 21(3): 102-103, 105. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: foals, imprinting, training of animals.

Miller, R.M. (1998). **Training methods are important.** *Journal of Equine Veterinary Science* 18(9): 562-563. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, training of animals.

Miller, R.M. (1995). **Early learning: The complete training of the newborn foal during its imprinting and critical learning periods.** Video Velocity: Virginia City, Nevada, USA.

NAL Call Number: Videocassette no. 2593

Abstract: Demonstrates techniques for training newborn foals to accept grooming, hoof trimming, clipping, veterinary examinations, trailer loading and unexpected objects.

Descriptors: training foals, imprinting, equine psychology, behavior of foals.

Misumi, K., H. Sakamoto, and R. Shimizu (1995). **Changes in skeletal muscle composition in response to swimming training for young horses.** *Journal of Veterinary Medical Science* 57(5): 959-961. ISSN: 0916-7250.

NAL Call Number: SF604.J342

Descriptors: horses, training methods, exercise alternatives, swimming, skeletal muscle response.

Miyata, H., T. Sugiura, M. Kai, A. Hiraga, and M. Tokuriki (1999). **Muscle adaptation of Thoroughbred racehorses trained on a flat or sloped track.** *American Journal of Veterinary Research* 60(12): 1536-1539. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, Thoroughbreds, training methods, skeletal muscle response.

Mohr, E., H. Krzywanek, and W. Pinkowski (1999). **Monitoring training success using a lactate-speed relationship.** *Journal of Veterinary Medicine Series A* 46(9): 565-571. ISSN: 0931-184X.

NAL Call Number: 41.8 Z5

Descriptors: training, success evaluation methods.

Munoz, A., R.G. Lucas, M. Benito, J. Palacio, M.M. Lopez, K. Satue, and F.M. Castejon (2001). **Evaluacion del entrenamiento mediante el analisis hematologico y bioquimico plasmatico en caballos angloarabes de carreras. [Evaluation of training level using haematological and biochemical plasmatic analysis in Anglo Arabian horses].** *Medicina Veterinaria* 18(7/8): 491-499. ISSN: 0212-8292.

Descriptors: horses, training level assessment, exercise, blood chemistry analysis, biochemical response analysis.

Language of Text: Spanish with an English summary.

Munoz, A., R. Santisteban, M.D. Rubio, E.I. Aguera, B.M. Escribano, and F.M. Castejon (1999). **Locomotor, cardiocirculatory and metabolic adaptations to training in Andalusian and Anglo-Arabian horses.** *Research in Veterinary Science* 66(1): 25-31. ISSN: 0034-5288.

NAL Call Number: 41.8 R312

Descriptors: horses, exercise response, training protocol variation, heart rate, blood chemistry analysis.

Munoz, A., R. Santisteban, M.D. Rubio, R. Vivo, E.I. Aguera, B.M. Escribano, and F.M. Castejon (1997). **Training as an influential factor on the locomotor pattern in Andalusian horses.** *Journal of Veterinary Medicine Series A* 44(8): 473-480. ISSN: 0931-184X.

NAL Call Number: 41.8 Z5

Descriptors: horses, Andalusians, effects of training, movement patterns.

Munoz, A., K. Satue, S. Rovira, R.G. Lucas, and M. Benito (2005). **Electrocardiographic ventricular repolarisation processes in Andalusian horses before and after physical training.** *Bulgarian Journal of Veterinary Medicine* 8(1): 23-34. ISSN: 1311-1477.

Descriptors: cardiac output, cardiac rhythm, chloride, electrocardiography, electrolytes, exercise, heart, heart rate, polarization, potassium, racehorses, sodium, training, ventricles, horses.

Murray, R.C., H.C. Janicke, F. Henson, and A. Goodship (2000). **Equine carpal articular cartilage fibronectin distribution associated with training, joint location and cartilage deterioration.** *Equine Veterinary Journal* 32(1): 47-51. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, effects of training, joints, carpus, articular cartilage, cartilage breakdown.

Nielsen, B.D., G.D. Potter, L.W. Greene, E.L. Morris, M. Murray Gerzik, W.B. Smith, and M.T. Martin (1998). **Response of young horses in training to varying concentrations of dietary calcium and phosphorus.** *Journal of Equine Veterinary Science* 18(6): 397-404. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, training, calcium, phosphorus, mineral nutrition, nutrient intake, dosage, feed supplements, bone density, urine analysis, feces composition, blood chemistry, magnesium, nutrient balance.

Notes: Meeting Information: Paper presented at the Equine Nutrition and Physiology Society Annual Symposium, Fort Worth, Texas, USA; May 28-31, 1997.

Normando, S., I. Perini, and F. Gottardo (2006). **The importance of the trainer's gaze in horse training.** *Journal of Animal and Veterinary Advances* 5(3): 256-259. ISSN: 1680-5593.

Online: <http://medwelljournals.com/abstract/?doi=javaa.2006.256.259>

Descriptors: training methods, ethological characteristics, round pen training, effect of eye contact with trainer on behavior.

Ohmura, H., A. Hiraga, H. Aida, M. Kuwahara, and H. Tsubone (2002). **Effects of initial handling and training on autonomic nervous function in young Thoroughbreds.** *American Journal of Veterinary Research* 63(11): 1488-1491. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, Thoroughbreds, autonomic nervous system, effects of training, effects of handling.

Ohmura, H., A. Hiraga, H. Aida, A. Matsui, Y. Inoue, and Y. Asai (2004). **Adaptation of Thoroughbreds to oxygen transport mechanisms through training.** *Journal of Equine Science* 15(1): 25. ISSN: 1340-3516.

NAL Call Number: SF277.J37

Descriptors: horses, Thoroughbreds, training, aerobic capacity, exercise, oxygen transport evaluation, diagnostic methods, cardiovascular system, respiratory system.

Ohmura, H., A. Hiraga, A. Matsui, H. Aida, Y. Inoue, K. Sakamoto, M. Tomita, and Y. Asai (2002). **Changes in running velocity at heart rate 200 beats/min (v200) in young Thoroughbred horses undergoing conventional endurance training.** *Equine Veterinary Journal* 34(6): 634-635. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, Thoroughbreds, endurance training, speed evaluation.

Patterson Kane, J.C., E.C. Firth, D.A.D. Parry, A.M. Wilson, and A.E. Goodship (1998). **Effects of training on**

collagen fibril populations in the suspensory ligament and deep digital flexor tendon of young Thoroughbreds. *American Journal of Veterinary Research* 59(1): 64-68. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, effects of training, tendon composition, ligament composition.

Perkins, N.R., S.W.J. Reid, and R.S. Morris (2005). **Profiling the New Zealand Thoroughbred racing industry. 1. Training, racing and general health patterns.** *New Zealand Veterinary Journal* 53(1): 59-68. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Descriptors: horses, Thoroughbreds, race performance, training methods, animal health, racing industry.

Perkins, N.R., S.W.J. Reid, and R.S. Morris (2004). **Effect of training location and time period on racehorse performance in New Zealand. 1. Descriptive analysis.** *New Zealand Veterinary Journal* 52(5): 236-242. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Descriptors: horses, racehorses, race performance, effect of training surface, effect of time period.

Perkins, N.R., C.W. Rogers, E.C. Firth, and B.H. Anderson (2004). **Musculoskeletal responses of 2-year-old Thoroughbred horses to early training. 3. In vivo ultrasonographic assessment of the cross-sectional area and echogenicity of the superficial digital flexor tendon.** *New Zealand Veterinary Journal* 52(5): 280-284. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Descriptors: horses, Thoroughbreds, tendons, cross-sectional area, echogenicity, effects of early training, ultrasonography.

Podolak, M., W. Kedzierski, and I. Janczarek (2004). **Wplyw intensywnego treningu na poziom wybranych parametrow biochemicznych krwi i liczbe tetnau koni rasy arabskiej. [Intense training of arabian horses and its effect on the level of selected biochemical indices in their blood and heart rate].** *Medycyna Weterynaryjna* 60(4): 403-406. ISSN: 0025-8628.

NAL Call Number: 41.8 M463

Descriptors: horses, effects of intensive training, exercise, biochemical indices, cardiovascular system.

Language of Text: Polish.

Poole, D.C., D.J. Marlin, and H.H. Erickson (2002). **Plasticity of muscle energetics in the horse after training.** *Equine Veterinary Journal* 34(1): 6-7. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, effects of training, exercise, skeletal muscle.

Porciello, F., F. Rueca, A. Fruganti, C. Pieramati, and G.P. Macolino (2001). **Relationship between racing performance and echocardiographic measurements before and after training in Thoroughbred horses.** *Journal of Veterinary Internal Medicine* 15(3): 321. ISSN: 0891-6640.

NAL Call Number: SF601.J65

Descriptors: horses, racehorses, exercise, training, performance analysis, echocardiographs.

Notes: Meeting Information: 19th Annual American College of Veterinary Internal Medicine Forum, Denver, CO, USA; May 23-26, 2001.

Porr, C.A., E.A. Ott, E.L. Johnson, and J.B. Madison (1997). **Bone mineral in young Thoroughbred horses is affected by training.** *Equine Practice* 19(8): 28-31. ISSN: 0162-8941.

NAL Call Number: SF951.E62

Descriptors: horses, Thoroughbreds, effects of training, bone mineral content.

Prado Filho, J.R.C. do and F. Sterman de A (2004). **Avaliacao da densidade mineral ossea em potros da raca Puro Sangue Ingles em inicio de treinamento. [Evaluation of mineral bone density in Thoroughbred horses under an initial training programme].** *Brazilian Journal of Veterinary Research and Animal Science* 41(6): 384-388. ISSN: 1413-9596.

Descriptors: analytical methods, bone density, bone mineralization, bones, techniques, Thoroughbred, horses.
Language of Text: Portuguese with an English summary.

Price, J.S., B. Jackson, R. Eastell, A.M. Wilson, R.G.G. Russell, L.E. Lanyon, and A.E. Goodship (1995). **The response of the skeleton to physical training: a biochemical study in horses.** *Bone* 17(3): 221-227. ISSN: 8756-3282.

Descriptors: horses, effects of training, skeletal changes.

Raidal, S.L., D.N. Love, G.D. Bailey, and R.J. Rose (2000). **Effect of single bouts of moderate and high intensity exercise and training on equine peripheral blood neutrophil function.** *Research in Veterinary Science* 68(2): 141-146. ISSN: 0034-5288.

NAL Call Number: 41.8 R312

Descriptors: horses, training, exercise, circulatory system.

Raidal, S.L., R.J. Rose, and D.N. Love (2001). **Effects of training on resting peripheral blood and BAL-derived leucocyte function in horses.** *Equine Veterinary Journal* 33(3): 238-243. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, exercise, training of animals, adverse effects, lymphocytes, macrophages, neutrophils, phagocytosis, bronchoalveolar lavage, blood, oxidation.

Rivera, E., S. Benjamin, B. Nielsen, J. Shelle, and A.J. Zanella (2002). **Behavioral and physiological responses of horses to initial training: The comparison between pastured versus stalled horses.** *Applied Animal Behaviour Science* 78(2/4): 235-252. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: training horses, stalls, pastures, heart rate, cortisol, blood plasma, animal behavior, Arabian horses, learning ability.

Notes: In the special issue: *Equine Behavior* edited by K. Houpt and R. Rudman.

Rivero, J.L.L. (1996). **Muscle biopsy as a tool for assessing muscular adaptation to training in horses.** *American Journal of Veterinary Research* 57(10): 1412-1416. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, training, muscle change assessment methods, muscular biopsy.

Rivero, J.L.L., M.C. Ruz, A.L. Serrano, and A.M. Diz (1995). **Effects of a 3 month endurance training programme on skeletal muscle histochemistry in Andalusian, Arabian and Anglo-Arabian horses.** *Equine Veterinary Journal* 27(1): 51-59. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, endurance training, effects of exercise, skeletal muscle.

Rivero, J.L.L., R.J. Talmadge, and V.R. Edgerton (1996). **Correlation between myofibrillar ATPase activity and myosin heavy chain composition in equine skeletal muscle and the influence of training.** *Anatomical Record* 246(2): 195-207.

Descriptors: horses, effects of training, skeletal muscle, muscular composition.

Rogers, C.W. and E.C. Firth (2004). **Musculoskeletal responses of 2-year-old Thoroughbred horses to early training. 2. Measurement error and effect of training stage on the relationship between objective and subjective criteria of training workload.** *New Zealand Veterinary Journal* 52(5): 272-279. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Descriptors: horses, race training, exercise, workload determination methods, injury, lameness.

Rogers, C.W., E.C. Firth, and B.H. Anderson (2005). **Musculoskeletal responses of 2-year-old Thoroughbred horses to early training. 5. Kinematic effects.** *New Zealand Veterinary Journal* 53(2): 95-100. ISSN: 0048-0169.

NAL Call Number: 41.8 N483

Descriptors: horses, race training level variation, kinematic parameters, lameness, stride variation.

Rosa, G. de, F. Napolitano, F. Marinaro, A. Bordi, G. Migliori, and F. Grasso (2005). **The influence of early handling on the behavioural reaction of foals at 2 months of age.** *Italian Journal of Animal Science* 4(Suppl. 2): 409-411. ISSN: 1594-4077.

Descriptors: foals, Thoroughbreds, handling techniques, training, effect of early handling, equine behavior.

Language of Text: English with an Italian summary.

Notes: Meeting Information: Proceedings of the Scientific Association of Animal Production (ASPA) 16th Congress, Torino, Italy, 28-30 June 2005.

Rubio, M.D., B.M. Escribano, E.I. Agueera, A. Munoz, and F.M. Castejon (1998). **The effect of forced training on blood and plasma parameters in Andalusian horses.** *Tieraerztliche Umschau* 53(5): 269-271, 273-274. ISSN: 0049-3864.

NAL Call Number: 41.8 T445

Descriptors: horses, effects of training, blood chemistry.

Rueca, F., M.B. Conti, M.C. Marchesi, F. Porciello, and G. Avellini (2000). **Proposta di un test standardizzato su treadmill e pista nella valutazione del livello di allenamento di cavalli da endurance. Andamento del lattato e del profilo muscolare. [Proposal of a standardized exercise test on treadmill and track for the assessment of the level of training in endurance riding horses. Trends of lactate and muscular profile].** *Atti Della Societa' Italiana Delle Scienze Veterinarie* 54: 289-290. ISSN: 0518-3588.

Abstract: The AA performed a standardised exercise test on treadmill and track to evaluate increasing fitness in endurance riding horses. The LDH and CPK modifications during the test on treadmill showed LDH patterns as an indicator of the early stages of training, while CPK patterns as an indicator of more advanced level.

Descriptors: endurance horses, fitness evaluation, treadmill exercise test, physical activity, isoenzymes, muscles, lactate dehydrogenase, creatine kinase, enzymatic analysis.

Language of Text: Italian.

Sandberg, L., P. Miller, and J.C.J. Fuller (1998). **The effect of intensive training and beta-hydroxy-beta-methylbutyrate (hmb) on muscle glycogen concentrations in the horse.** *Journal of Animal Science* 81(Suppl. 1): 175. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, effects of training, metabolites, muscles.

Notes: Meeting Information: Joint Meeting of the American Dairy Science Association and the American Society of Animal Science, Denver, Colorado, USA; July 28-31, 1998.

Santamaria, S., M.F. Bobbert, W. Back, A. Barneveld, and P.R. van Weeren (2005). **Effect of early training on the jumping technique of horses.** *American Journal of Veterinary Research* 66(3): 418-24.

Abstract: OBJECTIVE: To investigate the effects of early training for jumping by comparing the jumping technique of horses that had received early training with that of horses raised conventionally. ANIMALS: 40 Dutch Warmblood horses. PROCEDURE: The horses were analyzed kinematically during free jumping at 6 months of age. Subsequently, they were allocated into a control group that was raised conventionally and an experimental group that received 30 months of early training starting at 6 months of age. At 4 years of age, after a period of rest in pasture and a short period of training with a rider, both groups were analyzed kinematically during free jumping. Subsequently, both groups started a 1-year intensive training for jumping, and at 5 years of age, they were again analyzed kinematically during free jumping. In addition, the horses competed in a puissance competition to test maximal performance. RESULTS: Whereas there were no differences in jumping technique between experimental and control horses at 6 months of age, at 4 years, the experimental horses jumped in a more effective manner than the control horses; they raised their center of gravity less yet cleared more fences successfully than the control horses. However, at 5 years of age, these differences were not detected. Furthermore, the experimental horses did not perform better than the control horses in the puissance competition. CONCLUSIONS AND CLINICAL RELEVANCE: Specific training for jumping of horses at an early age is unnecessary because the effects on jumping technique and jumping capacity are not permanent.

Descriptors: early training, kinematic analysis, jumping technique, jumping capacity.

Santamaria Penalta, S. (2004). *Van veulen tot springpaard: ontwikkeling van springtechniek en het effect van*

training op jonge leeftijd. [From foal to performer: Development of the jumping technique and the effect of early training]. Dissertation, Proefschrift Universiteit Utrecht: Netherlands. 111 p.

Online: 9039336768

NAL Call Number:

Descriptors: effects of early training on horses, show jumping, training of animals, kinematics, kinetics, forecasting future performance, saddle performance, horse mechanics.

Notes: Thesis.

Sapua, M., M. Budzynska, J. Kamieniak, W. Krupa, M. Hetman, and A. Zamoyska (2004). **Wpyw treningu 100-dniowego i stopnia pobudliwosci nerwowej ogierow na zmiany mechaniki ich ruchu. [Influence of 100-day training and nervous irritability on movement mechanics changes in stallions]**. *Annales Universitatis Mariae Curie Sklodowska Sectio EE Zootechnica (Poland)* 22: 229-235. ISSN: 0239-4243.

NAL Call Number: SF84.A56

Descriptors: horses, stallions, behavior, movement characteristics, effects of training.

Language of Text: Polish with an English summary.

Shanahan, S. (2003). **Trailer loading stress in horses: behavioral and physiological effects of nonaversive training (TTEAM)**. *Journal of Applied Animal Welfare Science* 6(4): 263-274. ISSN: 1088-8705.

NAL Call Number: HV4701.J68

Descriptors: horses, transport, stress, safety, behavior, physiology, trailering techniques, Tellington Touch Equine Awareness Method, TTEAM.

Shearman, J.P., M.J. Hamlin, and W.G. Hopkins (2002). **Effect of tapered normal and interval training on performance of Standardbred pacers**. *Equine Veterinary Journal* 34(4): 395-399. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, Standardbreds, training methods, effects of training, performance.

Siciliano, P.D., C.E. Kawcak, and C.W. McIlwraith (2000). **The effect of initiation of exercise training in young horses on vitamin K status**. *Journal of Animal Science* 78(9): 2353-2358. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, effects of training, early training, nutrition, vitamins.

Soendergaard, E. (1999). *Opdraet Og Haandtering Af Hingsteplage: Traenings- Og Indlaeringsforberedelse. [Rearing and Handling of Colt Foals: Preparation for Training and Learning]*, Intern Rapport. Danmarks Jordbrugsforskning (Denmark), Danmarks Jordbrugsforskning, Foulum (Denmark), 51 p.

Descriptors: horses, animal training, animal learning, rearing techniques, mental ability, behavior, stabling, feed intake, animal husbandry methods, behavior, feeding habits.

Language of Text: Danish.

Spier, S.J., J.B. Pusterla, A. Villarroel, and N. Pusterla (2004). **Outcome of tactile conditioning of on selected handling neonates, or "imprint training" measures in foals**. *Veterinary Journal* 168(3): 252-258. ISSN: 1090-0233.

NAL Call Number: SF601.V484

Descriptors: horses, foals, behavior, imprint training, training methods, handling, limb handling.

Spinka, M., R.C. Newberry, and M. Bekoff (2001). **Mammalian play: Training for the unexpected**. *Quarterly Review of Biology* 76(2): 141-168.

Descriptors: play behavior, training, kinematic response, emotional response, stimuli.

Stephens, T.L., G.D. Potter, P.G. Gibbs, and D.M. Hood (2004). **Mineral balance in juvenile horses in race training**. *Journal of Equine Veterinary Science* 24(10): 438-450. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, racehorses, nutrition, training, mineral absorption, calcium, phosphorus, magnesium.

Stevanovic, J., J. Vitic, R. Trailovic, D. Trailovic, and N. Mijatovic (1996). **Some protein, lipoprotein and lipid**

alterations in serum of show jumping horses during different phases of training. *Acta Veterinaria* 46(2-3): 81-86.

NAL Call Number: TRANSL 30948

Descriptors: horses, effects of training, jumping, blood chemistry.

Suwannachot, P. (2001). *K⁺-homeostasis in horses: Effects of training and food supply on the Na⁺, K⁺-ATPase concentration in skeletal muscle.* Dissertation, Utrecht University: Utrecht, Netherlands. 203 p.

Online: 9039326517

Descriptors: training of horses, food supply, homeostasis, skeletal muscle, supply balance, potassium, effects of training and food supply.

Notes: Thesis.

Suwannachot, P., C.B. Verkleij, S. Kocsis, R.R.v. Weeren, and M.E. Everts (2001). **Specificity and reversibility of the training effects on the concentration of Na⁺, K⁺-ATPase in foal skeletal muscle.** *Equine Veterinary Journal* 33(3): 250-255. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: foals, skeletal muscle, exercise, sodium, potassium, adenosinetriphosphatase, muscles, water content, gluteus medium, semitendinosus, masseter muscle.

Tyler, C., L. Golland, D. Evans, D. Hodgson, and R. Rose (1995). **Changes in gas exchange during prolonged training and overtraining in horses.** *Medicine and Science in Sports and Exercise* 27(5 Suppl.): S202.

Descriptors: horses, effects of training, effects of overtraining, gas exchange, respiratory system, circulatory system.

Notes: Meeting Information: 42nd Annual Meeting of the American College of Sports Medicine, Minneapolis, Minnesota, USA; May 31-June 3, 1995.

Valent, M., M. Halo, P. Kalas, and P. Cupka (1996). **Mineralny profil dostihovych koni pocas treningoveho procesu. [Mineral profile of race horses during the training process].** *Acta Zootechnica*(51): 105-110. ISSN: 1335-258X.

NAL Call Number: S13.A28

Abstract: Change in blood serum macroelements in a group of seven race horses during training over a distance of 1,000 to 2,800 m were investigated. Blood samples were collected in order to assess Ca, inorganic P, Mg, Na and K during three training periods, including a testing period, as follows: the end of racing period (1); the end of resting period (2); the end of preparation period consisting of two phases - quantitative (3) and qualitative (4). A significant effect of the training process on blood serum levels of calcium, inorganic phosphorus and potassium was confirmed. Higher levels of inorganic P and K were observed at the end of the second and the third under a moderate physical rate of horse. Lower levels of inorganic P and K were characteristic of the higher physical activity during the racing season (1) and the qualitative phase of training (4).

Descriptors: racehorses, animal training, metabolism, blood serum macroelements, distance of training, levels of calcium, inorganic phosphorus and potassium.

Language of Text: Slovak with an English summary.

Valette, J.P., P.H. Heiles, and R. Wolter (1996). **Multivariate analysis of exercise parameters measured during the training of Thoroughbred racehorses.** *Pferdeheilkunde* 12(4): 470-473. ISSN: 0177-7726.

Descriptors: horses, Thoroughbreds, early training, performance indicators, heart rate, velocity, cardiovascular system.

Language of Text: English with a German summary.

Notes: Meeting Information: Association for Equine Sports Medicine, 15th Meeting on Equine Welfare and Sports Medicine, Bonn, Germany; June 24-28, 1996.

Van Breda, E. (2006). **A nonnatural head-neck position (Rollkur) during training results in less acute stress in elite, trained, dressage horses.** *Journal of Applied Animal Welfare Science* 9(1): 59-64.

Abstract: This study measured parameters of stress in recreational, trained horses (REC; n = 7) and elite (International Grand Prix level) trained, dressage horses (DRES; n = 5). The training of the DRES horses uses

an unnatural head-neck position (Rollkur), whereas in the REC horses such training techniques are not common. The study measured stress by using heart rate variability analysis for 30 min postfeeding in the morning and 30 min postexercise after a morning training session. The study found no significant difference at rest between the REC and DRES horses. During the posttraining measurements, however, the DRES horses showed, among others, a less sympathetic and increased parasympathetic dominance. These results suggest that DRES horses tend to have less acute stress than do REC horses postexercise. The findings of this study suggest maintaining the health and well-being of DRES horses despite nonnatural, biomechanical positions.

Descriptors: training techniques, stress analysis, stress in trained recreation horses vs. trained dressage horses, biomechanics, heart rate variability analysis, equine welfare.

Vatistas, N.J., R.L. Sifferman, J. Holste, J.L. Cox, G. Pinalto, and K.T. Schultz (1999). **Induction and maintenance of gastric ulceration in horses in simulated race training.** *Equine Veterinary Journal*(Suppl. 29): 40-44. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, racehorses, gastrointestinal system, gastric ulceration, effects of training, stress, serum cortisol levels.

Verheyen, K.L.P., W.E. Henley, J.S. Price, and J.L.N. Wood (2005). **Training-related factors associated with dorsometacarpal disease in young Thoroughbred racehorses in the UK.** *Equine Veterinary Journal* 37(5): 442-448. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, racehorses, Thoroughbreds, bone disease, effects of training, risk factors.

Verheyen, K.L.P. and J.L.N. Wood (2004). **Descriptive epidemiology of fractures occurring in british Thoroughbred racehorses in training.** *Equine Veterinary Journal* 36(2): 167-173. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, racehorses, Thoroughbreds, training, epidemiological studies.

Vervuert, I., M. Coenen, U. Wedemeyer, C. Chrobok, J. Harmeyer, and H.P. Sporleder (2002). **Calcium homeostasis and intact plasma parathyroid hormone during exercise and training in young Standardbred horses.** *Equine Veterinary Journal* 34(7): 713-718. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, training, calcium, endocrine system, homeostasis.

Vervuert, I., M. Coenen, U. Wedemeyer, and J. Harmeyer (2002). **Biochemical markers of bone activity in young Standardbred horses during different types of exercise and training.** *Journal of Veterinary Medicine Series A* 49(8): 396-402. ISSN: 0931-184X.

NAL Call Number: 41.8 Z5

Descriptors: horses, training, bone activity, evaluation methods.

Vervuert, I., M. Coenen, and J. Zamhofer (2005). **Effects of draught load exercise and training on calcium homeostasis in horses.** *Journal of Animal Physiology and Animal Nutrition* 89(3/6): 134-139. ISSN: 0931-2439.

Online: <http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=jpn>

Descriptors: calcium homeostasis, training regimens, treadmill training, draught load training, incline training, blood lactate, plasma total calcium, blood ionized calcium, blood pH, plasma inorganic phosphorus, plasma intact parathyroid hormone.

Vervuert, I., A. Lange, S. Winkelsett, F. Ellendorff, and M. Coenen (2005). **Veränderungen von Knochenmarkern und intaktem PTH im Blut im Verlaufe eines praxisüblichen Vielseitigkeitstrainings bei Warmblutpferden. [Changes in bone markers and intact PTH in blood during a common training programme for three-day eventing horses].** *Pferdeheilkunde* 21(5): 439-445. ISSN: 0177-7726.

Descriptors: calcium metabolism, bone metabolism, hypocalcemia, training regimens, endurance training, dressage training, incline training.

Language of Text: German with an English summary.

- Vieira, F.A.C., R.Y.A. Baccarin, J.A.K. Aguiar, and Y.M. Michelacci (2005). **Urinary excretion of glycosaminoglycans in horses: changes with age, training, and osteoarthritis.** *Journal of Equine Veterinary Science* 25(9): 387-400. ISSN: 0737-0806.
NAL Call Number: SF951.J65
Descriptors: urinary glycosaminoglycans, keratan sulfate, chondroitin sulfate, cartilage, age variables, gender variables, training variables, osteoarthritis, ion exchange chromatography.
- Wallin, L., E. Strandberg, and J. Philipsson (2003). **Genetic correlations between field test results of Swedish warmblood riding horses as 4-year-olds and lifetime performance results in dressage and show jumping.** *Livestock Production Science* 82(1): 61-71. ISSN: 0301-6226.
NAL Call Number: SF1.L5
Descriptors: horses, sporthorses, genetics, performance evaluation methods.
- Walton, S. (1998). **Beery's training method.** *Rural Heritage* 23(3): 26-27. ISSN: 0889-2970.
NAL Call Number: SF311.E9
Descriptors: horses, training of animals, animal behavior, Ohio.
- Waran, N.K. and R. Casey (2005). **Horse training.** In: D.S. Mills and S.M. McDonnell (Editors), *The Domestic Horse: The Evolution, Development and Management of Its Behaviour*, Cambridge University Press: Cambridge, UK, p. 184-195. ISBN: 0521814146 (hardback); 0521891132 (paperback).
NAL Call Number: SF281.D66 2005
Descriptors: horses, behavior, handling, training methods.
- Waran, N., P. McGreevy and R.A. Casey (2002). **Training methods and horse welfare.** In: N. Waran (Editor), *The Welfare of Horses*, Animal Welfare, Kluwer Academic Publishers: Dordrecht, Netherlands, p. 151-180. ISBN: 1402007663.
NAL Call Number: SF285.3.W43 2002
Descriptors: horse care, handling, natural behavior of horses, domestication, training, performance horses, conditioning to stimuli, learning processes, influence of early experience, motivational forces, prey species, development of abnormal behavior, innovative training methods.
- Warren, L.K., L.M. Lawrence, and K.N. Thompson (1999). **The influence of betaine on untrained and trained horses exercising to fatigue.** *Journal of Animal Science* 77(3): 677-684. ISSN: 0021-8812.
NAL Call Number: 49 J82
Descriptors: horses, training levels, intense exercise, betaine.
- Warren Smith, A.K., A.N. McLean, H.I. Nicol, and P.D. McGreevy (2005). **Variations in the timing of reinforcement as a training technique for foals (*Equus caballus*).** *Anthrozoos* 18(3): 255-272. ISSN: 0892-7936.
Online: www.thepress.purdue.edu
Descriptors: handling procedures, learning facilitation techniques, positive and negative reinforcement, training methods.
Notes: Meeting Information: The International Society for Anthrozoology (ISAZ) 13th Annual Conference, Advances in the Science and Application of Animal Training, 6 October, 2004.
- Whitton, R.C., R.C. Murray, C. Buckley, A.E. Goodship, and P. Lekeux (1999). **An MRI study of the effect of treadmill training on bone morphology of the central and third tarsal bones of young Thoroughbred horses.** *Equine Veterinary Journal*(Suppl. 30): 258-261. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, effects of training, carpus, tarsus, bone modelling, treadmill training.
Notes: Meeting Information: Proceedings of the Fifth International Conference on Equine Exercise Physiology, Utsunomiya, Japan, 20-25 September 1998. *Equine Exercise Physiology* 5.

Williams, J.L., T.H. Friend, M.N. Collins, M.J. Toscano, A. Sisto Burt, and C.H. Nevill (2003). **Effects of imprint training procedure at birth on the reactions of foals at age six months.** *Equine Veterinary Journal* 35(2): 127-132. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, foals, behavior, training methodology, effects of imprint training.

Williams, J.L., T.H. Friend, M.J. Toscano, M.N. Collins, A. Sisto Burt, and C.H. Nevill (2002). **The effects of early training sessions on the reactions of foals at 1, 2, and 3 months of age.** *Applied Animal Behaviour Science* 77(2): 105-114. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: foals, age differences, training of animals, imprinting, newborn animals, heart rate, stimuli, escape responses, responses, animal handling.

Wilsher, S., W.R. Allen, and J.L. Wood (2006). **Factors associated with failure of Thoroughbred horses to train and race.** *Equine Veterinary Journal* 38(2): 113-8.

Abstract: REASONS FOR PERFORMING STUDY: The low productivity associated with training and racing of young Thoroughbreds (TBs) in the UK due to athletic inability, injury and disease requires further study. OBJECTIVES: To identify the time points and causes of losses during growth and training phases of a cohort of 1022 TB foals born in 1999 up to the end of their third year. METHODS: Movement and fate of 1022 Thoroughbred foals conceived in 1998 and born live in 1999 were monitored from birth to age 3 years. Those (n = 562) that entered training age 2 and/or 3 years with one of 161 registered trainers in Britain or Ireland in 2001/2 were analysed as to their subsequent performance and the incidence of 9 common injuries or infective or metabolic illnesses. RESULTS: Of the 1022 foals identified, 537 (52%) entered training at age 2 years, 289 (28%) were exported, 60 (6%) were kept as 'stores' for National Hunt (NH) racing, 58 (6%) died or were destroyed, 25 (2%) were waiting to enter training at age 3 years, 17 (2%) were never intended for racing and 36 (4%) were untraceable. Race records showed that 327 (61%) of the 2-year-olds in training competed one or more times, 95 (18%) won and 165 (31%) were placed. Only 28 (5%) earned enough prize money to cover their training fees. Sore shins and inflammatory airway disease (IAD) were the 2 ailments most commonly encountered. In 2002, 431 (80%) of the previous year's 2-year-olds remained in training aged 3 years and 25 entered training having not raced previously. Of the 456 3-year-olds in training, 347 (76%) raced one or more times 138 (30%) won, 218 (48%) were placed and 78 (17%) recouped their training fees. Joint problems and sore shins were the ailments most commonly suffered and, with the exception of rhabdomyolysis ('tying up'), colts and geldings suffered a higher rate of musculoskeletal injuries than fillies. CONCLUSION: Previous reports of high nonrun and nonplaced rates, high incidence of injury and cost-ineffectiveness of 2-year-olds in flat-race training were confirmed. Potential relevance: This study lays the basis for further studies of the facets involved in wastage.

Descriptors: racing productivity, training, Thoroughbreds, athletic performance, injury, disease, growth and training.

Notes: Comments: Comment In: *Equine Veterinary Journal*. 2006 Mar;38(2):98-100.

Yamano, S., D. Eto, T. Sugiura, M. Kai, A. Hiraga, M. Tokuriki, and H. Miyata (2002). **Effect of growth and training on muscle adaptation in Thoroughbred horses.** *American Journal of Veterinary Research* 63(10): 1408-1412. ISSN: 0002-9645.

NAL Call Number: 41.8 Am3A

Descriptors: horses, Thoroughbreds, effects of training, growth, musculoskeletal system.

Young, L.E. (1999). **Cardiac responses to training in 2-year-old Thoroughbreds: an echocardiographic study.** *Equine Veterinary Journal*(Suppl. 30): 195-198. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, Thoroughbreds, cardiovascular system, echocardiography, cardiac hypertrophy, race training, exercise.

Notes: Meeting Information: Proceedings of the Fifth International Conference on Equine Exercise Physiology, Utsunomiya, Japan, 20-25 September 1998. *Equine Exercise Physiology* 5.

Young, L.E. and J.L.N. Wood (2000). **Effect of age and training on murmurs of atrioventricular valvular regurgitation in young Thoroughbreds.** *Equine Veterinary Journal* 32(3): 195-199. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, Thoroughbreds, training level variation, age variation, cardiovascular system.

Zurr, D. (2001). **Tellington-Touch-Every-Animal-Method in der Tierarztpraxis. [The Tellington-Jones "Touch Every Animal" manipulation method for training horses and dogs, and its application to veterinary practice].** *Ganzheitliche Tiermedizin* 15(2): 80-84. ISSN: 0939-7868.

NAL Call Number: SF603.D48

Descriptors: horses, dogs, training methods, Tellington-Jones technique, clinical technique, veterinary medicine.

Language of Text: German with an English summary.

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Transportation

Anonymous (2004). **Proceedings of the Second International Conference on the Transportation of Horses.**

Veterinary Journal 168(2): 194-203. ISSN: 1090-0233.

NAL Call Number: SF601.V484

Descriptors: horses, transport, trailer safety, physiology, stress, animal welfare, meeting abstracts.

Notes: Meeting Information: Meeting held at Hartpury College, Gloucestershire, UK; July 12-13, 2003.

Anonymous (2003). **Heightened security precautions may cause problems for horse transportation.** *Journal of the*

American Veterinary Medical Association 222(11): 1495-1496. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: bioterrorism prevention and control, horses, transportation, animal welfare, behavior, animal, security measures.

Anonymous (1999). **Transporter les chevaux: synthese bibliographique. [Transport of horses: a review].** *Equ'Idee*

Bulletin D'Information Sur Les Equides(36): 8-14.

Descriptors: horse, transportation, animal welfare, literature reviews, effects of transportation on stress.

Language of Text: French.

Aronica, V., P. Medica, F. Cusumano, and E. Fazio (2000). **Effetto della lunghezza del percorso - dell' eta' e della**

razza sulla funzionalita' tiroidea nel cavallo dopo trasporto su strada. [Effect of transport stress and

influence of distance - age and breed on thyroid function of horses]. *Atti Della Societa' Italiana Delle*

Scienze Veterinarie 54: 93-94. ISSN: 0518-3588.

Abstract: Circulating levels of total and free iodothyronines in horses before and after road transport of different length have been studied. The effects of age and breed of horses on iodothyronines levels after road transport have also been studied. Results showed a significant increase of T3 after transport of 60-120 km, in 6 and 12 years old horses, and in Thoroughbred. T4 is significantly increased after transport of 60-120 and 240-300 km, in 12 years old and in Sanfratellano horses. fT3 levels increased significantly in 12 years old Standardbred horses. A significant increase of fT4 after transport of 120-180 and 180-240 km was detected.

Descriptors: stallions, transport of animals, road transport, animal welfare, breeds animals, thyroid hormones, age, evaluation, animal performance, thyroid gland, stress, animal glands, body parts, endocrine glands, hormones, horses, taxa, transport.

Language of Text: Italian with an English summary.

Australia Standing Committee on Agriculture and Resource Management. (1998). **Land Transport of Horses: Model**

Code of Practice for the Welfare of Animals, SCARM Report, CSIRO: Collingwood, Victoria, Australia, 19 p.

ISBN: 0643062882.

NAL Call Number: HV4890.A3A37 1998a

Descriptors: horse transport, effect of transportation on stress, animal welfare, road travel, railway travel.

- Boureau, V. and E. Gaultier (2002). **La phobie des transports chez le cheval: approche par l'ethologie clinique. I. Semiologie.** [Transport phobias in horses: a clinical ethological approach. I. Symptomatology]. *Pratique Veterinaire Equine* 34(135): 13-17. ISSN: 0395-8639.
NAL Call Number: SF957.P7
Descriptors: horses, transport, stress, behavior, symptomatology.
Language of Text: French with an English summary.
- Boureau, V. and E. Gaultier (2002). **La phobie des transports chez le cheval: approche par l'ethologie clinique. II. Therapeutique.** [Transport phobias in horses: clinical ethology approach. II. Therapy]. *Pratique Veterinaire Equine* 34(135): 19-23. ISSN: 0395-8639.
NAL Call Number: SF957.P7
Descriptors: horses, transport, behavior, therapy.
Language of Text: French.
- Cavallone, E., M. Di Giancamillo, B. Secchiero, A. Belloli, D. Pravettoni, and E.M. Rimoldi (2002). **Variations of serum cortisol in Argentine horses subjected to ship transport and adaptation stress.** *Journal of Equine Veterinary Science* 22(12): 541-545. ISSN: 0737-0806.
NAL Call Number: SF951.J65
Descriptors: horses, transportation, stress, blood composition, serum cortisol, creatine kinase.
- Coerezza, U., D. Cambiaghi, G. Sella, and M. Pizzoli (1997). **Air transport of competition horses.** *Ippologia* 8(1): 41-52. ISSN: 1120-5776.
Descriptors: horses, stress management, air transport.
Language of Text: English and Italian.
- Collins, M.N., T.H. Friend, F.D. Jousan, and S.C. Chen (2000). **Effects of density on displacement, falls, injuries, and orientation during horse transportation.** *Applied Animal Behaviour Science* 67(3): 169-179. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: density effects on displacement, trailer transportation, effects of time, turns and acceleration, effects of stocking density on the number of falls and injuries.
- Ellis, P.M. (1998). **Pegasus joins the jet age [Transporting horses by air].** *Australian Veterinary Journal* 76(7): 476-477. ISSN: 0005-0423.
NAL Call Number: 41.8 Au72
Descriptors: air transport of horses, Japanese encephalitis, flight cages, quarantine procedure, African horse sickness, disease prevention.
- Englund, L. and J. Pringle (2004). **New diseases and increased risk of diseases in companion animals and horses due to transport.** *Acta Veterinaria Scandinavica, Supplementum*(Suppl. 100): 19-25. ISSN: 0065-1699.
Descriptors: African horse sickness, Babesiosis, disease transmission, disease vectors, dog diseases, epidemiology, European Union, horse diseases, pets, public health, risk, stray animals, transport of animals, vector borne diseases, viral diseases, zoonoses, African horse sickness virus, Borna disease virus, dogs, horses, Metastigmata, *Rhipicephalus sanguineus*, *Rickettsia conorii*, *Leishmania infantum infantum*, *Babesia canis*, *Babesia caballi*, *Theileria equi*.
Notes: Meeting Information: Animal Transports - Disease Risks and Welfare Aspects. Proceedings of the 17th Nordic Committee for Veterinary Scientific Cooperation (NKVet), Hanasaari, Finland, 27-28 November 2003.
- Friend, T.H. (2000). **Dehydration, stress, and water consumption of horses during long-distance commercial transport.** *Journal of Animal Science* 78(10): 2568-2580. ISSN: 0021-8812.
NAL Call Number: 49 J82
Descriptors: horses, transport of animals, duration, distance traveled, dehydration physiological, stress, water intake, starvation, water deprivation, weight losses, environmental temperature, relative humidity, blood chemistry, chloride, blood serum, respiration rate, heart rate, hydrocortisone, osmolarity, blood protein, blood

plasma, animal welfare.

Friend, T.H., M.T. Martin, D.D. Householder, and D.M. Bushong (1998). **Stress responses of horses during a long period of transport in a commercial truck.** *Journal of the American Veterinary Medical Association* 212(6): 838-844. ISSN: 0003-1488.

NAL Call Number: 41.8 Am3

Descriptors: horses, transport, stress, hydration, body weight, blood analysis, body temperature, serum electrolyte concentration, fatigue.

Gibbs, A.E. and T.H. Friend (1999). **Horse preference for orientation during transport and the effect of orientation on balancing ability.** *Applied Animal Behaviour Science* 63(1): 1-9. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, transportation, balance, orientation preference.

Giovagnoli, G., M. Trabalza Marinucci, A. Bolla, and A. Borghese (2002). **Transport stress in horses: an electromyographic study on balance preservation.** *Livestock Production Science* 73(2/3): 247-254. ISSN: 0301-6226.

NAL Call Number: SF1.L5

Descriptors: horses, transport of animals, stress, heart rate, muscles, muscle physiology, electromyography, gravity, posture.

Higgins, A. (2004). **Transportation of horses - The vital necessity to get it right.** *Veterinary Journal* 168(2): 109. ISSN: 1090-0233.

NAL Call Number: SF601.V484

Descriptors: horses, transportation, animal welfare, animal safety.

Iacono, C.M., T.H. Friend, R.D. Johnson, P.D. Krawczel, and G.S. Archer (2007). **A preliminary study on the utilization of an onboard watering system by horses during commercial transport.** *Applied Animal Behaviour Science* 105(1-3): 227-231 ISSN: 0168-1591.

Online: <http://www.sciencedirect.com/science/article/B6T48-4KGX80T-1/2/d13d4a83a432b9028563ab6a1bb1ab89>

NAL Call Number: QL750.A6

Descriptors: transportation of horses, slaughter horses, provision of an onboard watering system, drinking behavior, consumption of water, horses.

Ishida, N., S. Hobo, T. Takahashi, Y. Nanbo, F. Sato, T. Hasegawa, and H. Mukoyama (1999). **Chronological changes in superoxide-scavenging ability and lipid peroxide concentration of equine serum due to stress from exercise and transport.** *Equine Veterinary Journal*(Suppl. 30): 430-433. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, racehorses, stress, superoxide production, antioxidative ability, exercise, transport.

Notes: Meeting Information: Proceedings of the Fifth International Conference on Equine Exercise Physiology, Utsunomiya, Japan, 20-25 September 1998. *Equine Exercise Physiology* 5.

Jones, W.E. (2003). **Transporting horses: Minimizing the stress.** *Journal of Equine Veterinary Science* 23(12): 543-545. ISSN: 0737-0806.

NAL Call Number: SF951.J65

Descriptors: horses, transportation, stress reduction, animal welfare, safety.

Kapron, M., I. Janczarek, R. Kolstrung, and M. Pluta (1996). **Wpływ transportu w przyczepie samochodowej na zmienność tętna u koni w typie kuca felńskiego. [Effects of transport on the heart rate in Felin Ponies].** *Medycyna Weterynaryjna* 52(1): 56-58. ISSN: 0025-8628.

NAL Call Number: 41.8 M463

Descriptors: horses, transportation, stress, cardiovascular system, heart rate.

Language of Text: Polish with an English summary.

- Kawamoto, K., H. Sato, M.A. Oikawa, T. Yoshihara, M. Kaneko, and H. Matsuda (1996). **Nerve growth factor activity detected in equine peripheral blood of horses with fever after truck transportation.** *Journal of Equine Science* 7(2): 43-46. ISSN: 1340-3516.
NAL Call Number: SF277.J37
Descriptors: horses, long distance transport, nerve growth factor, evaluation methods, equine shipping fever, stress, pathogenesis factors.
- Kusunose, R. and K. Torikai (1996). **Behavior of untethered horses during vehicle transport.** *Journal of Equine Science* 7(2): 21-26. ISSN: 1340-3516.
NAL Call Number: SF277.J37
Descriptors: horses, behavior, transportation, posture preference, directional preference.
- Leadon, D.P. (1995). **Transport stress and the equine athlete.** *Equine Veterinary Education* 7(5): 253-255. ISSN: 0957-7734.
NAL Call Number: SF951.E67
Descriptors: horses, racehorses, air temperature, relative humidity, neuroleptics, analgesics, anesthetics, respiratory diseases, diagnosis, transport of animals, stress, domestic animals, drugs, horses, neurotropic drugs, organic diseases, temperature, transport, useful animals, working animals.
- Marlin, D.J. (2004). **Transport of horses.** In: *Equine Sports Medicine and Surgery: Basic and Clinical Sciences of the Equine Athlete*, p. 1239-1250.
Descriptors: blood chemistry, body weight, crates, digestive tract, hematology, heart rate, hormones, hydrocortisone, immune system, livestock transporters, musculoskeletal system, respiratory system, stress, stress response, transport of animals, weight losses, horses.
- Marlin, D.J., R.C. Schroter, S.L. White, P. Maykuth, G. Matthesen, P.C. Mills, N. Waran, and P. Harris (2001). **Recovery from transport and acclimatisation of competition horses in a hot humid environment.** *Equine Veterinary Journal* 33(4): 371-379. ISSN: 0425-1644.
NAL Call Number: SF955.E6
Descriptors: horses, transportation, fitness, heat stress, acclimatisation, hydration, behavior.
- Momoi, Y., H. Kato, H.Y. Youn, H. Aida, S. Takagi, T. Watari, R. Goitsuka, H. Tsujimoto, and A. Hasegawa (1996). **Elevation of serum G-CSF level in horses with transportation-induced fever.** *Journal of Veterinary Medical Science* 58(6): 537-541. ISSN: 0916-7250.
NAL Call Number: SF604.J342
Descriptors: horses, transportation, transportation-induced fever, pathogenesis, blood chemistry, microbial infection, granulocyte-colony stimulating factor.
- Mortensen, S., T. Soveri, and S. Lewerin (2004). **Animal transports - disease risks and welfare aspects. Proceedings of the 17th Nordic Committee for Veterinary Scientific Cooperation (NKVet), Hanasaari, Finland, 27-28 November 2003.** *Acta Veterinaria Scandinavica, Supplementum*(Suppl. 100): 7-36. ISSN: 0065-1699.
Descriptors: animal welfare, disease control, disease prevention, dog diseases, horse diseases, sows, transport of animals, cattle, dogs, horses, pigs.
- Nambo, Y., M.A. Oikawa, T. Yoshihara, A. Kuwano, S. Hobo, S.I. Nagata, G. Watanabe, and K. Tya (1996). **Effects of transport stress on concentrations of LH and FSH in plasma of mares: a preliminary study.** *Journal of Equine Science* 7(1): 1-5. ISSN: 1340-3516.
NAL Call Number: SF277.J37
Descriptors: horses, mares, transportation, stress, effects of travel on the endocrine system, blood chemistry.
- Oikawa, M., S. Hobo, T. Oyamada, and H. Yoshikawa (2005). **Effects of orientation, intermittent rest and vehicle cleaning during transport on development of transport-related respiratory disease in horses.** *Journal of Comparative Pathology* 132(2-3): 153-168. ISSN: 0021-9975.
NAL Call Number: 41.8 J82
Descriptors: horses, transport, stress, inflammatory response, respiratory system, effect of orientation, effect of

rest.

Oikawa, M., S. Takagi, R. Anzai, H. Yoshikawa, and T. Yoshikawa (1995). **Pathology of equine respiratory disease occurring in association with transport.** *Journal of Comparative Pathology* 113(1): 29-43. ISSN: 0021-9975. **NAL Call Number:** 41.8 J82

Descriptors: horses, stress, road transport, pathology, animal diseases, bacterioses, pathogenesis, respiratory diseases, *Streptococcus equi*, transport of animals, bacteria, infectious diseases, organic diseases, Streptococcaceae, *Streptococcus*, transport, opportunistic infections, predisposition.

Oikawa, M.A., S. Takagi, and K. Yashiki (2004). **Some aspects of the stress responses to road transport in Thoroughbred horses with special reference to shipping fever.** *Journal of Equine Science* 15(4): 99-102. ISSN: 1340-3516.

NAL Call Number: SF277.J37

Descriptors: horses, transport, stress, respiratory disease, respiratory system.

Parker, R., R. Watson, E. Wells, S.N. Brown, C.J. Nicol, and T.G. Knowles (2004). **The effect of blindfolding horses on heart rate and behaviour during handling and loading onto transport vehicles.** *Animal Welfare* 13(4): 433-437. ISSN: 0962-7286.

NAL Call Number: HV4701.A557

Descriptors: animal transport, restraint of animals, animal care equipment, animal behavior, animal welfare, blinkers.

Smith, B.L., J.H. Jones, W.J. Hornof, J.A. Miles, K.E. Longworth, and N.H. Willits (1996). **Effects of road transport on indices of stress in horses.** *Equine Veterinary Journal* 28(6): 446-454. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, transport, stress, respiratory system, post transport respiratory disease, hematology.

Stefancic, I. and D. Martin (2005). **Influence of transport conditions on animal welfare.** In: *Animals and Environment. Proceedings of the XIIth ISAH Congress on Animal Hygiene, September 4, 2005-September 8, 2005, Warsaw, Poland, Warsaw, Poland, Vol. 2, p. 148-152.*

Descriptors: transportation, European Union, animal welfare.

Stewart, M., T.M. Foster, and J.R. Waas (2003). **The effects of air transport on the behaviour and heart rate of horses.** *Applied Animal Behaviour Science* 80(2): 143-160. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, animal transport, air transportation, animal stress, animal behavior, animal physiology, posture, heart rate, physical activity, body temperature, animal welfare, balancing.

Stull, C.L. (1999). **Responses of horses to trailer design, duration, and floor area during commercial transportation to slaughter.** *Journal of Animal Science* 77(11): 2925-2933. ISSN: 0021-8812.

NAL Call Number: 49 J82

Abstract: Nine trailer loads of horses (n = 306) transported to slaughter facilities with distances ranging 596 to 2,496 km were studied to characterize the type of horses used in commercial markets and the physiological responses and number of injuries due to transportation under summer environmental conditions. Slaughter horse candidates were middle-aged (11.4 +/- .4 yr), possessed moderately fleshy body condition, weighed 432 +/- 3.3 kg, and were of Quarter Horse or Thoroughbred breeding. The mean weight loss during commercial transport was 4%. The percentage of injured horses was greater (P < .05) for two-tiered "potbelly" (29.2%) compared with straight-deck (8.0%) trailers; however, the stress indicators of cortisol and neutrophil:lymphocyte ratio and rectal temperature showed greater (P < .05) responses following transport in straight-deck trailers. As trip duration increased from 5 h 45 min to 30 h, muscle fatigue (lactate concentration) and dehydration (hematocrit and total protein concentration) were the major physiological considerations, especially in durations over 27 h. The percentage of horses injured was less (P < .05) in trailers with 1.14 to 1.31 m² of floor area per horse than in trailers with 1.40 to 1.54 m² of floor area per horse. However, most physiological responses (white blood cell count, total protein concentration, and neutrophil:lymphocyte ratio) to transportation were less (P < .05) in

horses provided with the greater floor area.

Descriptors: horses, slaughter, transport of animals, animal welfare, handling, stress, livestock transporters, long distance transport, duration, area, wounds, body condition, weight losses, body temperature, hydrocortisone, biochemical markers, neutrophils, lymphocytes, dehydration, hematocrit, lactic acid, protein content, blood chemistry.

Stull, C.L. and A.V. Rodiek (2002). **Effects of cross-tying horses during 24 h of road transport.** *Equine Veterinary Journal* 34(6): 550-555. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, transport, cross tying, stress, respiratory disease, blood chemistry.

Stull, C.L. and A.V. Rodiek (2000). **Physiological responses of horses to 24 hours of transportation using a commercial van during summer conditions.** *Journal of Animal Science* 78(6): 1458-1466. ISSN: 0021-8812.

NAL Call Number: 49 J82

Descriptors: horses, weight losses, transport of animals, stress, summer, leukocyte count, neutrophils, lymphocytes, ratios, blood chemistry, hematocrit, blood protein, blood sugar, lactic acid, hydrocortisone, creatine kinase, enzyme activity, animal welfare.

Stull, C.L., S.J. Spier, B.M. Aldridge, M. Blanchard, and J.L. Stott (2004). **Immunological response to long-term transport stress in mature horses and effects of adaptogenic dietary supplementation as an immunomodulator.** *Equine Veterinary Journal* ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: horses, transport, prolonged stress, immune system, nutrition, supplements.

Tischner, M.J. and J. Niezgodna (2004). **The effect of transport on the intensity of stress reaction in the mares in early and late pregnancy.** *Reproduction in Domestic Animals* 39(4): 284. ISSN: 0936-6768.

NAL Call Number: SF105.A1Z8

Descriptors: horses, mares, pregnancy, transport, stress, endocrine system.

Notes: Meeting Information: 8th Annual Conference of the European Society for Domestic Animal Reproduction (ESDAR), Warsaw, Poland; September 23-25, 2004.

Tischner, M., J. Niezgodna, and D. Wronska Fortuna (2005). **Wplyw krotkotrwalego transportu na natezenie reakcji stresowych u klaczy i zrebiatek. [Influence of short term transportation on the intensity of stress reactions in mares and their foals].** *Medycyna Weterynaryjna* 61(4): 451-454. ISSN: 0025-8628.

NAL Call Number: 41.8 M463

Descriptors: horses, mares, foals, transport, stress, endocrine system.

Language of Text: Polish.

Toscano, M.J. and T.H. Friend (2001). **A note on the effects of forward and rear-facing orientations on movement of horses during transport.** *Applied Animal Behaviour Science* 73(4): 281-287. ISSN: 0168-1591.

NAL Call Number: QL750.A6

Descriptors: horses, transport, orientation, balance, behavior, stress.

Van den Berg, J.S., A.J. Guthrie, R.A. Meintjes, J.P. Nurton, D.A. Adamson, C.W. Travers, R.J. Lund, and H.J. Mostert (1998). **Water and electrolyte intake and output in conditioned Thoroughbred horses transported by road.** *Equine Veterinary Journal* 30(4): 316-323. ISSN: 0425-1644.

NAL Call Number: SF955.E6

Descriptors: transport of animals, homeostasis, water balance, electrolytes, feed intake, water uptake, breeds animals, drinking habits, body weight, urine, feces, excretion, sodium, potassium, alkali metals, behavior, body fluids, feeding habits, nutrient uptake, Thoroughbreds, dehydration.

Wagener, A. (1996). **Uebersicht ueber die Wirkung des Transportes auf Pferde. [Review of the effects of transport on horses].** *Tieraerztliche Umschau* 51(10): 633-641. ISSN: 0049-3864.

NAL Call Number: 41.8 T445

Descriptors: racehorses, saddle horses, stress associated with travel, animal health, transport of horses.

Language of Text: German with German and English summaries.

Waran, N.K. and D. Cuddeford (1995). **Effects of loading and transport on the heart rate and behaviour of horses.** *Applied Animal Behaviour Science* 43(2): 71-81. ISSN: 0168-1591.
NAL Call Number: QL750.A6
Descriptors: horses, transport of animals, road transport, heart rate, animal behavior, stress.

Waran, N., D. Leadon and T. Friend (2002). **The effects of transportation on the welfare of horses.** In: N. Waran (Editor), *The Welfare of Horses*, Animal Welfare, Kluwer Academic Publishers: Dordrecht, Netherlands, p. 125-150. ISBN: 1402007663.
NAL Call Number: SF285.3.W43 2002
Descriptors: transporting horses, methods of transport, potential stressors, animal welfare, air transportation, trailering.

Waran, N.K., V. Robertson, D. Cuddeford, A. Kokoszko, and D.J. Marlin (1996). **Effects of transporting horses facing either forwards or backwards on their behaviour and heart rate.** *The Veterinary Record* 139(1): 7-11. ISSN: 0042-4900.
NAL Call Number: 41.8 V641
Descriptors: behavior, stress, animal welfare, transport of animals, horses, heart rate, blood circulation, physiological functions, transport, vocalization, heart rate.

Western Australia. Dept. of Local Government and Regional Development. (2003). **Horse Transportation: Code of Practice for the Transportation of Horses in Western Australia**, Dept. of Local Government and Regional Development: Western Australia, 28 p.
NAL Call Number: HV4733.W472 2003
Descriptors: horses, transportation, Australia, Western Australia, horse handling, animal welfare.

Transportation -- Web Resources

Horse Trailer Maintenance and Trailering Safety. *Margentino, M.R.*

Online: <http://nasdonline.org/document/1047/d000842/horse-trailer-maintenance-and-trailering-safety.html>

Description: On the web site of the National Ag Safety Database, this page provides links to an article and fact sheets on trailer safety and transporting of horses.

Trailer Safety. *Lamm, W.*

Online: <http://www.whmentors.org/saf/trailer.html>

Description: Winter maintenance of trailer electrical system, undercarriage, interior and exterior body. Also provides a list of items to include in a First Aid kit.

Trailer Safety. *Rietveld, G.*

Online: http://www.omafra.gov.on.ca/english/livestock/horses/facts/info_trailering.htm

Description: How to determine safety and suitability of tow vehicle as well as trailer undercarriage, lights, hitch, tires, brakes, doors, ramps, and floorboards. Also lists items to include in a trailer emergency kit.

Horse Trailering. *Rietveld, G. and B. Wright.*

Online: http://www.omafra.gov.on.ca/english/livestock/horses/facts/info_trailering.htm

Description: Explains factors that can affect horses during transport and includes tips for minimizing stress as well as items to include in an emergency kit.

Physiology, Balance, and Management of Horses During Transportation. *Stull, C.L.*

Online: http://www.vetmed.ucdavis.edu/vetext/INF-AN/INF-AN_HORSTRANSPT.HTML

Description: How to assess and control equine stress during travel. Explains how to prepare your horse for travel as well as the elements of orientation and balance during transport and the effect of transport on metabolic and energy pathways. Also includes health issues and diseases associated with travel.

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General Web Resources

American Association of Equine Practitioners (AAEP).

Online: http://www.aaep.org/index.php?tried_cookie_test=true

Description: A professional association of equine veterinarians whose mission is to improve the health and welfare of the horse, to further the professional development of its members, and to provide resources and leadership for the benefit of the equine industry. Under Resources, the AAEP provides disaster preparedness information and vaccination guidelines.

Care Guidelines for Equine Rescue and Retirement Facilities. *American Association of Equine Practitioners.*

Online: <http://www.aaep.org/custdocs/AAEPCareGuidelinesRR2012.pdf>

Description: Guidelines that provide information on basic horse care and management as well as consideration for horses entering rescue or retirement facilities with unique health challenges.

Code of Practice for Welfare Organisations Involved in the Keeping of Horses, Ponies, and Donkeys. *UK. National Equine Welfare Council.*

Online: <http://www.newc.co.uk/law/equine-code-of-practice/>

Description: The NEWC in the United Kingdom put together this code of practice which outlines minimum standards of equine care to express that a high standard of husbandry is fundamental to welfare.

Equine Health Monitoring and Surveillance. *USDA. Animal and Plant Health Inspection Service.*

Online: <http://www.aphis.usda.gov/vs/nahss/equine/>

Description: Provided by the National Animal Health Surveillance System (NAHSS), this page provides information on equine health monitoring and surveillance activities conducted by many Federal and State government agencies.

Equine Industry Welfare Guidelines Compendium. *UK. National Equine Welfare Council.*

Online: <http://www.newc.co.uk/wp-content/uploads/2011/10/Equine-Brochure-09.pdf>

Description: Sets out minimum standards of care and recommended practices required to appropriately look after a horse.

equine-reproduction.com.

Online: <http://www.equine-reproduction.com/index.shtml>

Description: Information on safe, productive and healthy equine reproduction techniques, with a special emphasis on promoting newer advanced technology.

Equine Species Working Group.

Online: <http://www.equinespeciesworkinggroup.com/>

Description: A United States task force that is evaluating the concept of a national ID system in order to determine if the horse industry could develop standards for equine identification.

Horse Breeds. *Oklahoma State University. Department of Animal Science.*

Online: <http://www.ansi.okstate.edu/breeds/horses/>

Description: Information about and images of horse breeds from all over the world, arranged alphabetically.

Horse Ownership Resources.

Online: http://riley.nal.usda.gov/nal_display/index.php?

info_center=8&tax_level=2&tax_subject=10&level3_id=0&level4_id=0&level5_id=0&want_id=459&topic_id=1587&placement_default=0

Description: A link to resources on horse ownership and management provided by the National Agricultural Library.

HorseQuest.info. *Kentucky Cooperative Extension Service. National Equine Resource Team.*

Online: <http://www.extension.org/horses>

Description: Search a database or ask a question about horses and receive a science-based, peer reviewed answer.

MyHorseMatters.com. *American Association of Equine Practitioners.*

Online: <http://www.myhorsematters.com/>

Description: Information on horse health. Also provides a calendar of upcoming educational opportunities.

Pain in Horses. *International Veterinary Academy of Pain Management.*

Online: <http://www.cvmb.colostate.edu/ivapm/animals/horses.htm>

Description: Lists signs that indicate pain or discomfort in horses. A brief discussion of causes and list of treatments are given.

TheHorse.com.

Online: <http://www.thehorse.com/>

Description: A monthly newsletter that focuses on horse health and welfare news. Registration is required to access the articles.

Welfare of Equids Ever-Evolving. *American Veterinary Medical Association.*

Online: <http://www.avma.org/onlnews/javma/feb00/s020100a.asp>

Description: This 2000 article published in the *Journal of the American Veterinary Medical Association* provides an overview of equine welfare issues.

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