Ensuring that mares have access to roughage throughout the day and night has beneficial effects on reproductive efficacy according to a recent report.

Horses have evolved as "trickle feeders" and are adapted to eating little and often. Modern management methods frequently interfere with this natural feeding routine, and have been implicated in causing welfare problems and health issues such as gastric ulcers and colic.

Now evidence has emerged to suggest that restricting the availability of food to just part of the day can be detrimental to breeding performance.

The study, "Temporal feeding pattern may influence reproduction efficiency, the example of breeding mares" by Haifa Benhajali and colleagues has been published in the journal PLOS One.

One hundred Arab breeding mares on the national breeding facility of Sidi Thabet, near Tunis, in Tunisia, were included in the study. They were randomly divided into two groups whose management differed only in the timing of availability of roughage. Mares were housed individually except for a period of six hours during the day when they were turned out into a paddock. They had free access to water, a small amount of cut grass was given at midday, and 4kg of barley was fed overnight.

The "Continuous feeding pattern" group (CF) had access to hay both when turned out and when housed for the rest of the day and night. They received 5kg hay in the stable at night and 5kg hay when turned out. The "standard feeding pattern" group (SFP) received 10kg hay only when housed. So the total amount of roughage provided each day for both groups was the same.

The researchers found that there was a significant difference between the two treatment groups. Those receiving hay throughout the day had fewer oestrus abnormalities and higher fertility. The conception rate in the CF mares was 81% compared with 55% in the SFP mares).

They conclude that "temporal patterns of feeding may be a major and underestimated factor in breeding."

Injecting medication directly into the joint is a common procedure for treating injuries in competition horses. It carries a risk of introducing infection into the joint. However, a recent report suggests that with adequate preparation serious consequences are uncommon.

The authors examined clinical records of all horses given intraarticular injections by nine ambulatory veterinary surgeons over a five year period. The vets were based at a specialist equine practice in Newmarket England dealing mainly with Thoroughbred racehorses.

The site of injection was prepared using standard aseptic technique, but usually the hair was not clipped. All injections were made using scrupulous aseptic injection technique.

Over 9000 injections were performed. Twelve horses developed complications after medication. Four of those developed joint sepsis, but all returned to work after having the joint flushed.

How risky is medicating joints?

The authors concluded that the risk of sepsis being induced inadvertently following intrasynovial medication was extremely low. They advised that intrasynovial medication with PSGAGs should be avoided unless antimicrobials are given at the same time.

For more details see:


How risky is medicating joints? Injecting medication directly into the joint is a common procedure for treating injuries in competition horses. It carries a risk of introducing infection into the joint. However, a recent report suggests that with adequate preparation serious consequences are uncommon.

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For more details see:


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Acceptability of smaller microchips

Although microchips are widely used for identifying horses throughout Europe, there is still some resistance to their use, with questions being raised about stress during implantation, inflammation at the site of implantation, and reliability of detection.

In response to this criticism, microchips that are even smaller have been developed. They may be less stressful to implant but do they work as well? Recent work has looked at whether such chips are reliable and if their implantation causes signs of stress.

The study, carried out at the Brandenburg State Stud at Neustadt (Dosse), Germany, was reported by Manuela Wulf and others in a recent edition of the Veterinary Record. Forty adult mares were implanted, on the left side of the neck, with a reduced-size microchip (10.9×1.6 mm). (Conventional microchips are 11.4×2.2 mm). Three different scanners were used to detect the microchips immediately, and on three further occasions up to 28 weeks after implantation.

The researchers found that scanners differed in their ability to read the microchips, although all scanners detected all chips on every occasion when scanned from the side of implantation. One scanner read all microchips successfully from both sides of the neck on four occasions up to 28 weeks after implantation. Two other scanners detected all of the chips from the side of implantation, but were less successful reading from the “wrong” side of the neck.

Did the horses find the implantation procedure stressful? The researchers monitored heart rate, heart rate variability and saliva cortisol levels during the implantation process in twelve of the mares. They also recorded the same information while pressing at the implantation site with a cannula without penetrating the skin. So each mare acted as its own control. They found a slight increase in heart parameters in both chip implantation and controls, but no change in cortisol levels.

The report's authors conclude that reduced-size microchips are highly reliable for identification of horses. “Compared with conventional microchips, the reduction in size did not impair readability. Microchip implantation is no pronounced stressor for horses.”

For more details see:


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New laminitis study

A new research project aiming to help horse owners reduce the impact of laminitis is being undertaken by the Animal Health Trust (AHT) in partnership with the Royal Veterinary College (RVC).

The study, which will extend over four years, is being funded by World Horse Welfare. It will take a closer look at management factors which may contribute to the development or recurrence of laminitis within the British horse and pony population. Through modifying these contributing factors, it is hoped that horse owners can significantly reduce the impact of this important welfare problem.

The AHT and RVC aim to create a website where owners from all over the country can register their horses and ponies and assist in the regular gathering of information related to potential risk factors for laminitis, over a period of two years.

This will help establish a timeline of events and get a better understanding of the factors leading to laminitic episodes. The study, to be conducted by PhD student Danica (Dee) Pollard, will follow-up on previous research conducted by Dr Claire Wylie in which factors such as rapid weight gain, increasing time since last deworming, box rest in the previous week and new access to grass in the past month increased the risk of laminitis. Dr Wylie’s study also revealed that factors such as feeding of additional supplements and transport in the previous week were associated with a reduced risk of laminitis.

These factors are all modifiable, meaning they could be changed by the owner, and this is why they are of particular interest to the new study.

Dee Pollard, based at the AHT, said: “This will be a very exciting opportunity for owners to be at the frontline of equine health research and contribute to a study which aims to provide evidence-based preventative strategies to combat laminitis.”

Horse owners interested in taking part in the research project are asked to register their interest via email to danica.pollard@ah.org.uk

Riding Arena Footing and Management

Ever wondered what's involved in providing a top quality arena surface, or wanted to know more about the various footing materials available?

Here's your opportunity. There's a free webcast on “Riding Arena Footing and Management” from MyHorseUniversity on November 26, 2013 at 7 PM ET.

Dr. Ann Swinker, Associate Professor in Equine Sciences, Penn State University and Horse Extension Specialist has been involved in the horse business for over 35 years. She will discuss the physical properties of the various footing materials that are available and the advantages and disadvantages. She will also consider the management of arena surfaces, the principles of maintenance and the signs that a surface needs to be changed or replaced.

You can register for the webcast now. Don't worry if you miss it, you can still catch it later as it will be archived on the website and will continue to be available (free).

For more details go to ....

http://myhorseuniversity.com/resources/webcasts/ridingarenafoo ting
Benefit of targeted worming

Worming only those horses that need it can be cost effective, even taking into account the cost of performing faecal worm egg counts, according to research published in the Veterinary Record.

Cyathostomins (small strongyles or redworms) as well as being responsible for a considerable proportion of worm-related disease in horses, are also the most likely to develop anthelmintic resistance.

Amongst other factors, the development of resistance has been attributed to the regular exposure of susceptible worm populations to anthelmintics. Interval dosing programmes, which were once recommended, are now being implicated in selecting for anthelmintic resistance.

Rather than concentrating on preventing excretion of worm eggs altogether, the aim now is to preserve anthelmintic sensitive nematode populations, while minimising the risk of parasite-associated disease.

It is now widely acknowledged that a more targeted approach is preferable. Current recommendations are that only those horses carrying a moderate or high worm burden are treated; thus ensuring that worms are not exposed to anthelmintics needlessly.

Faecal worm egg counts (FECs) are used to determine which horses need (or don’t need) treating. To many owners this may seem an unnecessary expense. However, recent work has shown that using FECs in this way helps reduce the overall cost of worming.

Hannah Lester, with colleagues at the Moredun Research Institute, and the Universities of Bristol, Liverpool and Edinburgh, monitored FECs at 3 monthly intervals over a nine month period. In all, 368 horses from 16 separate yards were involved in the study.

Horses with FECs greater than 200epg were treated. If treated, horses were given pyrantel (in March and June) and ivermectin in September. All horses received moxidectin/praziquantel in December.

The researchers compared the cost with that of a standard interval regime of two treatments with moxidectin and two of moxidectin and praziquantel - which is what had been common practice in the study population.

They estimated the cost of the two approaches by using average prices for anthelmintic products and faecal egg counts that they obtained off the internet. Even allowing for the cost of faecal egg count reduction tests (ie repeating the FEC after each treatment to check the anthelmintic had been effective) they found that, over the year, there was an average saving per yard of £294.44.

The study also showed that overall 15% of horses were responsible for shedding 80% of strongyle eggs. So a traditional interval program, in which all horses are treated regardless of FEC results, would mean 85% of horses being treated unnecessarily.

They conclude: “these findings support the notion that targeting anthelmintic treatments at those individuals with strongyle FEC of 200epg or greater facilitates a reduction in selection pressure for anthelmintic resistance. Moreover, the results show that such a strategy has a high chance of reducing the financial cost compared with that associated with more traditional interval treatment regimens, and horse owners should, therefore, be discouraged from the view that it is cheaper to treat all horses prophylactically over time.”

For more details see:

Cost comparison of faecal egg count directed anthelmintic delivery versus interval programme treatments in horses. HE Lester, DJ Bartley, ER Morgan, JE Hodgkinson, CH Stratford, JB Matthews
Vet Record (2013) 173, 371 doi: 10.1136/vr.101804
Wounds to the lower limbs of horses can prove challenging to manage. Recently there has been a growing interest in the use of honey in such cases.

Not all honey is the same. Its antibacterial quality depends on the type of honey and the conditions under which it was harvested and processed. Most honey contains hydrogen peroxide, which has antibacterial properties. Some types of honey contain additional active components. For example, the antibacterial properties of manuka honey are believed to be due to high concentrations of methylglyoxal, a compound usually found in only low quantities in other types of honey.

Manuka honey, produced by bees foraging on manuka plants (Leptospermum scoparium), native to Australia and New Zealand, has been the subject of considerable research. Honey from other sources is often used in practice, but there has been little research into how effective it is.

Researchers at the University of Glasgow have been examining various different types of shop-bought honey to determine if they were free from bacterial contamination and suitable for use on equine wounds. They also investigated the effect of various examples of uncontaminated honey on the growth of equine pathogens, and found that, in laboratory tests, certain varieties of honey are able to inhibit bacterial growth even at very low concentrations.

Their research was presented at the 2013 conference of the British Equine Veterinary Association and has been published in the Veterinary Journal.

They found that many commercial sources of honey were contaminated with bacteria. Of the samples examined, 18/29 were found to be contaminated with aerobic bacteria or fungi. The most commonly identified contaminating organism was Bacillus spp. However, potentially pathogenic organisms (Proteus and Enterobacteraceae) were identified from two honey samples.

Only uncontaminated honey samples were subjected to further investigation to assess their antibacterial properties. Ten bacterial isolates, collected from equine wounds, were inoculated onto nutrient agar plates containing honey in a range of concentrations. Bacterial species used included methicillin-resistant Staphylococcus aureus (MRSA), Staphylococcus aureus, Escherichia coli, Streptococcus equi, and Pseudomonas aeruginosa.

The researchers found that eight of the eleven uncontaminated honey samples tested were effective against all 10 bacterial isolates at concentrations from 4 to 16%. Overall, medical grade Manuka honey and a locally produced heather honey performed best.

They conclude that many honeys have antimicrobial properties, and may be effective in the treatment of wound infections. They note that the concentrations at which honey samples inhibited microbial growth were much lower than is likely to occur at the surface of an infected wound treated with honey.

However, they advise that “the use of shop-bought honey on wounds should be avoided, as contamination with potentially pathogenic microbes appears to be common. Honey sourced within the UK is as, and in some cases more, effective than medical grade honey sourced in New Zealand.”

For more details see:

The Antimicrobial Activity of Honey Against Common Equine Wound Isolates (pages 13–14)

R. Carnwath, E.M. Graham, K. Reynolds and P.J. Pollock

The Veterinary Journal (2013) http://dx.doi.org/10.1016/j.tvjl.2013.07.003

The Antimicrobial Activity of Honey Against Common Equine Wound Isolates

Carnwath R., Graham E.M., Reynolds K., Pollock P.J.


Special Issue: Clinical Research Abstracts of the British Equine Veterinary Association Congress 2013

DOI: 10.1111/evj.12145_33
Emergency ventilation system developed

Respiratory or cardiovascular arrest in outdoor animals poses a huge challenge to veterinarians. Ventilation equipment is generally hard to operate and requires electricity and compressed air. Anaesthetiologists at the University of Veterinary Medicine, Vienna (Vetmeduni Vienna) have developed an inexpensive device for the ventilation of large animals. They report that it is easy to transport and can save animal lives in emergencies. In work recently published in Equine Veterinary Education, the scientists confirm that their emergency ventilator is effective in horses.

The medical treatment of horses requires not only specialised knowledge but also specialised equipment. Horses’ lungs are large and when they breathe the volume is correspondingly large. A 500kg horse inhales around five litres with each breath. It is not easy to supply this in an emergency. Suitable respirators are available in hospitals but are not always there when they are needed, for example in the barn, in the pasture, in the woods, during transport or at other places where emergencies can and do occur.

Yves Moens is Head of the Vetmeduni’s Clinical Unit of Anaesthesiology and Perioperative Intensive Care Medicine. He and his colleagues have long been concerned by the number of horses that die avoidable deaths because of the lack of a suitable ventilation device. The scientists have designed a ventilation pump for large animals that veterinarians can use to resuscitate animals in the field. The device is similar to the bellows used to inflate air mattresses but has been adapted by the addition of a manually operated expiratory valve.

In the event of an emergency, the vet can intubate the animal on site by inserting a breathing tube into its trachea. The ventilator pump is connected to the bellows and operated by foot. Exhalation is effected via the second, manually controlled, valve.

To provide the 5-6 litres of air needed by an adult horse would require bellows that would be too large to be operated by one man and difficult to be transported easily in a conventional car. Although the Vetmeduni’s emergency ventilator can only provide 2.5 litres of air, the researchers believed that it would be sufficient for the respiration of horses if the bellows are activated several times in quick succession. They tested this idea on five anaesthetised Haflinger horses during castration surgery. The vets were able to show that gradual ventilation with the 2.5 litre pump is sufficient to keep the animals alive.

In recent decades, anaesthetic medicine for humans and animals has developed highly sophisticated equipment and narcotics. Researchers at the Vetmeduni are developing improved anaesthetic techniques and ventilation equipment to reduce the risks during surgery. The respiratory pump is one of the outcomes. ”It improves the safety of large animals in the field, both during routine anaesthesia and in emergencies. It will also help veterinarians to provide emergency first aid in these circumstances and respect the guidelines for good practice”, says Moens. “The respiratory pump is inexpensive and easy to use and will help veterinarians treat their patients in the field.”

For more details see:
A commercial foot pump for emergency ventilation of horses, proof-of-principle during equine field anaesthesia.
Stephanie von Ritgen, Ulrike Auer, Johannes Schramel, Yves Moens


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How accurate is thermography of horses’ legs?

Infrared thermography is increasingly being applied to investigate the cause of lameness in horses. The equipment is easy to handle and the method is fast and safe, both for the animal and for the vet. But is it accurate?

Recent work by Simone Westermann at the University of Veterinary Medicine, Vienna shows that the technique is surprisingly tolerant of variation in the position of the equipment, i.e. how far from the horse and at what angle to the animal the infrared camera is held. However, it is extremely important to ensure that the horse is not standing in a draught as even barely detectable wind speeds are sufficient to have a dramatic effect on the measurements.

The findings are published in two articles, one in the Journal of the American Veterinary Medical Association and the other in the Equine Veterinary Journal.

Since its introduction fifty or so years ago, thermography has been used increasingly to pinpoint the site of lameness in horses. The method is fast and safe and is based on a simple idea. The horse’s body surface emits infrared radiation that can be detected by an infrared camera, which is both easy and inexpensive to use. The camera produces a coloured image that shows the variation in surface temperature across the area investigated. The temperature is directly related to the presence of blood vessels near the skin, so the method can detect local inflammatory lesions or regions of modified blood flow and thus help localise the origin of lameness.

The theory is clear but to date there have been comparatively few investigations into the reliability of the technique. Furthermore, it is important to note that in practice trivial matters such as time constraints and movement of the horse can cause changes in both camera angle and distance of the camera to the area of the horse being investigated. The extent to which these changes affect the results of thermographic imaging is unknown. Finally, although it is generally accepted that thermographic imaging of horses should be performed in draught-free surroundings, there have not been any published studies on the effect of airflow on the results.

These issues have now been tackled by Simone Westermann of the Clinical Unit of Equine Surgery at the University of Veterinary Medicine, Vienna, together with colleagues at the University of Veterinary Medicine, Vienna (Vetmeduni Vienna) and with Adrian Ion at the Vienna University of Technology. The scientists found that the method was highly reproducible and was less sensitive to variations in camera position and angle than might be expected.

In fact, the results were almost completely unaffected by 20° changes in camera angle and increases of up to 50 cm in the distance of the camera from the animal. At a distance of 1m from the horse a 20° change in camera angle corresponds to about 35 cm. This represents the effective horizontal tolerance in positioning of the camera. As Westermann says, “vets should have little difficulty in remaining within this limit, so the method is applicable in practice”.

Surprisingly, the results showed that horses’ left and right forelimbs show minor differences in temperature and Westermann cautions that “it might be important to take these into account before reaching a final diagnosis.”
The technique is thus reliable and robust, at least in terms of variation in where the camera is located. However, it turned out to be extremely sensitive to even very gentle drafts. A wind speed of less than 1 m/s causes a drop in measured temperature of about 0.6°C, while winds of 1.3-2.6 m/s cause a drop of 1.5°C and winds of 3-4 m/s cause a drop of 2.1°C. The discrepancies are more than sufficient to lead to a wrong diagnosis, although even the highest wind speed tested is hardly perceptible: it would barely cause leaves on trees to move.

Westermann is keen to note the relevance of her work for vets who work on horses. As she says, “It turns out that it is not too important to be sure that the camera is in exactly the correct position before taking measurements. But it is essential to perform thermography on horses in a room that is completely free of draughts. If you don’t, your diagnosis will be completely unreliable.”

For more details see:


Updated Codes of Practice released

Codes of Practice for the 2014 equine breeding season have been published by the Horserace Betting Levy Board. The Codes set out voluntary recommendations to help breeders, in conjunction with their veterinary surgeons, to prevent and control specific diseases in all breeds of horse and pony. Information can be found on Contagious Equine Metritis, Equine Viral Arteritis, Equine Herpesvirus, Equine Colital Exanthema, Equine Infectious Anaemia, Dourine and Strangles.

The sections on Equine Herpesvirus and Strangles have been updated and expanded for 2014. http://codes.hblb.org.uk/index.php/page/2

Health Concerns for the Overweight Horse

A webcast from myhorseuniversity.com discusses health concerns for both under and overweight horses, with an emphasis on the overweight horse. Most horse owners understand the potential issues with horses being too thin, but may not be aware of the issues associated with the other extreme.

The webcast aims to help horse owners to assess if their horse is over or underweight, and have strategies to manage their overweight horses. The recorded webcast is available to view, free of charge, at:

http://myhorseuniversity.com/resources/webcasts/overweighthorse

Updated Foaling Guide now available.

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The protection given by equine flu vaccinations is not as straightforward as we might think according to a special focus on Equine Influenza (EIV) published in the Equine Veterinary Journal (EVJ). The role of vaccination in limiting the spread of infection and reducing the severity of clinical signs is considered from scientific, surveillance, animal health industry and regulatory viewpoints. The importance of vaccine strain and composition is also discussed.

Equine influenza is a highly contagious viral disease. It is rarely fatal, usually resolving within two to three weeks. However, an outbreak can be highly disruptive to training and competition schedules. Graeme Cooke, FEI Veterinary Director, writing in EVJ points out “protection against influenza depends on good management combined with a good vaccination programme using efficacious vaccine products, with as much of the equine population as possible being vaccinated. Limiting the effect of outbreaks also depends on having good organised surveillance, or at least taking samples quickly to obtain an early diagnosis. Very important for prevention is the routine application in stables of simple biosecurity measures to prevent the introduction of this and other diseases or at least to reduce their onward transmission. Biosecurity should be the first piece of advice that clinicians give to their clients about influenza prevention”.

Vaccination against equine influenza has been mandatory for racing Thoroughbreds in the United Kingdom since 1981, and major outbreaks have been few and far between since then. The aim of vaccination is two-fold: to protect the vaccinated individual from becoming ill and to limit the spread of infection by reducing the amount of virus a vaccinated horse will shed if it does become infected, this latter aim being the more important of the two.

The flu virus has an ability to change the proteins on its surface, a process known as antigenic drift. These surface proteins are the structures that are recognised by the immune-system. If they change, a vaccine which has been produced to recognise proteins on older virus strains will be less effective. The World Organisation for Animal Health (OIE) monitors field surveillance data and recommends suitable vaccine strains for inclusion in commercial vaccines. None of the vaccines currently on sale in UK have the most recently recommended strains and only one in the US achieves this.

However, vaccination is not the whole answer to the prevention of EIV outbreaks. Flu has been diagnosed in horses that have been vaccinated as well as those that have not, probably because of the use of mismatched vaccine strains. However, to date there have been no major flu outbreaks in vaccinated populations.

Although of little consequence for individuals, mismatched vaccine strains increase the likelihood of large outbreaks and played a role in the escape of the virus from the quarantine station in Australia, which seeded the major epidemic there.

Professor Celia Marr, Editor of Equine Veterinary Journal said: “The EIV disaster in Australia in 2007 was an important wake-up call, yet many racing authorities still have no requirement for vaccination. On-going surveillance and a better route to updating vaccine strains are key, while compliance with sport regulators’ requirements is a powerful motivator to ensure vaccination takes place.”

Professor Marr continued: “The British horseracing industry is to be commended as they fund a major surveillance programme via the HBLB but it would be good to see this effort translated into new products. It is important that horse owners realise that vaccinating their horses simply to comply with Sports regulators requirement may not actually achieve the frequency recommended by the manufacturers, particularly at the beginning of the course. The manufacturers recommendations must be followed if the vaccine is to be effective.”

The EVJ special focus on equine influenza can be accessed at: http://onlinelibrary.wiley.com/doi/10.1111/evj.2013.45.issue-6/issuetoc
Filling a gap in equine history

Scientists have announced the discovery of a new species of fossil horse from 4.4 million-year-old fossil-rich deposits in Aramis, Ethiopia. The findings have been reported in the Journal of Vertebrate Paleontology.

The animal had limbs with three toes and was about the size of a small zebra. It has been named *Eurygnathohippus woldegabrieli* after Giday WoldeGabriel, a geologist at Los Alamos National Laboratory. The research team wanted to recognize his many contributions in unraveling the geological complexities of the deposits in the Ethiopian Rift system where fossils of some of our oldest human ancestors have been found.

The horse fills a gap in the evolutionary history of horses but is also important for documenting how old a fossil locality is and in reconstructing habitats of human forebears of the time, said Scott Simpson, co-author of the research and professor of anatomy at Case Western Reserve University's School of Medicine, in Cleveland, Ohio. "This horse is one piece of a very complex puzzle that has many, many pieces."

The researchers found the first *E. woldegabrieli* teeth and bones in 2001, in the Gona area of the Afar Region of Ethiopia. This extinct species of horse was among the diverse array of animals that lived in the same areas as the ancient human ancestor Ardipithecus ramidus, commonly called Ardi.

"The fossil search team spreads out to survey for fossils in the now arid badlands of the Ethiopian desert," Simpson said. "Among the many fossils we found are the two ends of the foreleg bone—the canon—brilliant white and well-preserved in the red-tinted earth."

A year later, they returned and found part of the connecting shaft, which was split lengthwise but provided the crucial full length of the bone. The long slender bone indicates this ancient species was an adept runner, similar to modern zebras, and analyses of their teeth indicated they relied heavily on eating grasses in the grassy woodland environment.

*E. woldegabrieli* had longer legs than ancestral horses that lived and ate in forests about 6 million to 10 million years ago, Simpson said. The change helped them cover long distances as they grazed and escape lions, sabre-tooth cats and hunting hyenas that would run down their prey.

Other fossils they found included teeth, which are taller than their ancestors’ and with crowns worn flatter—more signs the horses had adapted to a grazing life. Analyses of the isotopic composition of the enamel confirmed that *E. woldegabrieli* was a dedicated grazer with a coarse diet similar to that of modern zebras, wildebeests, and white rhinoceroses.

"Grasses are like sandpaper," Simpson said. "They wear the teeth down and leave a characteristic signature of pits and scratches on the teeth so we can reliably reconstruct their ancient diets."

For more details see:

Eurygnathohippus woldegabrieli, sp. nov. (Perissodactyla, Mammalia), from the middle Pliocene of Aramis, Ethiopia.

doi: 10.1080/02724634.2013.829741
Australian vets and scientists from CSIRO (Commonwealth Scientific and Industrial Research Organisation) have given a surprise Christmas gift to ten-year old mare, Holly, who suffers from chronic laminitis.

She recently took the first steps in her new 3D printed titanium shoes that were custom designed to fit her foot.

The team of 3D printing experts worked with horse podiatrists to scan Holly’s feet and design the “horse-thotic” which aims to support the foot and encourage it to heal, whilst making Holly comfortable.

Holly has had laminitis for three years. Horse vet and farrier, Dr Luke Wells-Smith from the Equine Podiatry and Lameness Centre, said his team saw the 3D printed shoe CSIRO built for a race horse earlier this year and started to think about using 3D printing to rehabilitate lame horses.

"The new shoes will work to redistribute weight away from the painful areas of the laminic foot and give Holly, and horses like her, the chance to recover," he said.

"Many attempts have been made in the past to cure laminitis but it’s the 3D scanning and design part of this process that is so exciting to us.

"Christmas is looking a lot merrier for Holly this year. She should be walking normally and without pain in just a few weeks,” said Luke.

CSIRO’s 3D printing expert, John Barnes, said scanning the hoof would allow them to manufacture a shoe that is the ‘perfect fit’ for these complicated foot diseases, giving the horse the best possible chance for rehabilitation," he said.

"We know that 3D printing has the potential to create so many advanced biomedical products, but rehabilitation of horses has been a completely new area of work for CSIRO.

"We’re glad that this technology is opening so many doors and is now helping to aid the rehab process for these animals and get them walking comfortably again," he said.

See the video: