Researchers at Utrecht University in the Netherlands have succeeded in diagnosing equine overtraining syndrome by measuring nocturnal growth hormone secretion.

Dr Ellen de Graaf-Roelfsema and colleagues conducted the study in conjunction with researchers at Maastricht University, the Free University of Brussels and the University of Virginia (USA).

A successful training program gets the athlete to peak performance in time for the event. There’s a fine balance between doing enough suitable training and doing too much.

Pushing the athlete, human or equine, too hard may lead to “overtraining syndrome” and result in performance getting worse rather than better.

Overtraining is thought to be due to accumulated stress, from training or other factors, resulting in long term reduction in performance. It may take several months to regain the previous level of performance.

A less severe result of intensified exercise is “overreaching”. This is often regarded as a normal consequence for elite athletes as it only takes a couple of weeks for them to recover their previous form.

Growth hormone (GH) is thought to be important in controlling the recovery from stressful events and helping the individual restore their normal homeostatic balance.

The Utrecht study involved twelve Standardbred geldings (average 20 months old) - trained in pairs. Both horses in the pair were managed identically apart from their exercise regime.

The study covered a 32-week training period, which was divided into four phases.

Phase 1: habituation. (4 weeks duration) Horses followed a regime of light, but increasing, work to get them used to training on the treadmill.

Phase 2: normal training. (18 weeks) Horses received a mixture of endurance training and high intensity interval training.

Phase 3: intensified training. (6 weeks) During this phase one horse of each pair underwent an intensified exercise program. The other horse continued on the normal exercise regime (as in phase 2).

Phase 4: recovery / reduced training (4 weeks) Horses were exercised lightly.

The morning after the last day of each phase the horses were subjected to a standardized exercise test. Throughout the following night, from 22.00 - 06.00, samples were collected every five minutes for GH assay.

GH tends to be released in pulses. The pattern of those pulses is more important than the overall GH concentration level in the blood - so it’s not enough to simply measure the average levels in the blood.

Samples were collected at night because work (in humans) has shown that GH is released mainly during the recovery phase - during slow wave sleep.

They analyzed the samples using firstly deconvolution analysis and secondly a complex approach known as “approximate entropy”. This
Twelve horses were originally enrolled in the study. One pair had to drop out, so the results were based on results from ten horses.

“The intensively trained group clearly showed a loss of performance, indicative for over-reaching or maybe even over training.” Dr Graaf-Roelfsema reports.

Intensively trained horses tired more quickly during the standard exercise test than did normally trained horses. On average, they took 19% less time to fatigue compared with the control horses.

GH secretion became increasingly irregular after the intensive training phase. Indeed it had still not fully returned to normal even after the reduced exercise phase. Insensitively trained horses showed more frequent, smaller concentration peaks of GH secretion.

“We have demonstrated that intensified training for 6 weeks alters nocturnal GH pulsatility in young Standardbred horses compared to a control group by a diminished coordinated GH secretion”.

"We were able to distinguish between overtrained and control horses by evaluation of their nocturnal GH secretion pattern." Dr Graaf-Roelfsema points out. "However, it is a very labor intensive method and not very practical to use for the individual patient. We are working on that right now."

Having developed this method for diagnosing overtraining syndrome, the researchers can now focus on determining effective prevention and treatment methods.

The findings also offer the prospect of improved or preventive treatment for comparable stress related syndromes in humans such as burnout.


The 2009 Thoroughbred Racing and Breeding Seminar, will be held at Cheltenham Racecourse on 12th November.

The Seminar presents the latest research and thinking on horse health and welfare. It offers owners, trainers and breeders the chance to hear about the latest scientific work and learn how the findings can be applied to the day-to-day management of their horses.

Although it is aimed at Thoroughbred breeders and trainers, most horse owners will find the information relevant and useful.

The morning session looks at infectious diseases. Professor Jose Vasquez-Boland discusses advances in understanding *Rhodococcus equi* - the cause of a particularly troublesome pneumonia in foals. Professor Jacqui Matthews considers the growing problem of anthelmintic resistance.

The morning finishes with a veterinary student, deemed to be a rising star in the field of equine research, giving a short presentation of their recent project.

In the afternoon, attention turns to jet lag and how it affects the horse's performance. Dr Domingo Tortone strategies explains the work carried out at Bristol University. Dr Richard Piercy will consider practical and state of the art approaches to diagnosis and treatment of setfast and other muscle disorders.

The final speaker, Professor Stephen May, describes how the different imaging techniques are used to resolve complex musculoskeletal problems.

There is plenty of opportunity to ask questions during the day including, just before lunch, an "Ask the panel" session, which is always lively and often contentious.

For more details see: www.thoroughbred-seminar.co.uk
At the beginning of the last century, racing speeds improved dramatically. Race records show that at over a few years there was a 5-7% reduction in the times taken to run races.

What was responsible for this improvement was not a change in training or breeding, but a change in riding style of the jockeys.

In 1897, Todd Sloan, an American jockey, was the first to introduce a new style of race riding to Britain. Everyone else was still using an upright posture when galloping.

The new style involved the use of shorter stirrups and the now familiar crouched (“Martini-glass”) posture. Racing was transformed. Race times dropped as everyone rushed to adopt this new posture.

The crouched riding style has now become universal. And despite the best efforts of top trainers and breeders, such marked improvements in race times have not been seen since.

In fact, in the nearly 100 years since then the time taken to run the Epsom Derby has only dropped by a further 2%.

But how does changing the jockey’s posture affect the speed of the horse? Research performed at the Structure and Motion Laboratory of the Royal Veterinary College in London provides the answer.

“We had been looking at the literature and we saw that someone had shown that when humans wear a back pack that is allowed to slide up and down while they move they use less energy” explains Dr Andrew Spence. “That led us to suspect that when jockeys riding racehorses adopt this uncomfortable looking crouched posture, maybe they make the job of galloping easier for the horse.”

The research was carried out in conjunction with the British Racing School at Newmarket. Seventeen routine training sessions of five Thoroughbred racehorses with three racing jockeys were analysed. The researchers attached lightweight inertial sensors to the saddle and the jockey, and used GPS speed loggers to record the speed. So they were able to record the movement of horse and jockey independently and then compare them.

They found that the horse moves up and down with each stride but the jockey using the crouched posture follows a much smoother path.

“This martini-glass posture that the jockeys adopt is very good at letting their leg act like a shock absorber that soaks up the motions of the horse. This can save the horse’s legs a lot of work. The horse’s legs have to keep the jockey off the ground and support the jockey’s weight but they don’t have to do the extra work of making the jockey go up and down with each stride.”

So by adopting the crouched posture, jockeys isolate themselves from the motions of the horse. This reduces the energy the horse needs to carry the jockey, and so enhances performance.

The researchers point out that this posture requires substantial work by jockeys, who have near-maximum heart rates during racing.

For more details see:

Modern Riding Style Improves Horse Racing Times
T Pfau, A Spence, S Starke, M Ferrari and A Wilson.
Science (2009) 325, p. 289
DOI: 10.1126/science.1174605

http://www.rvc.ac.uk/SML/Research/Stories/ModernRidingStyle.cfm#movie
A new patented technique may help prevent some of the more serious complications of laminitis in affected horses.

Laminitis is a common debilitating condition of horses. The Lameness and Laminitis study carried out by the United States Department of Agriculture found that in a one-year period, 2% of horses are affected with laminitis. About 5% of affected horses die or are euthanized, and a further 20% suffer permanent damage.

Increased tension in the deep digital flexor tendon (DDFT) is implicated in the changes that occur within the foot. Treatment of laminitis often includes trying to reduce the pull of the DDFT on the pedal bone. This may be by means of shoeing, or by cutting the tendon.

Dr Daniel W. Carter of West Florida Veterinary Associates, Gulf Breeze Florida, and Dr J Ben Renfroe of the Child Neurology Center of Northwest Florida have developed a new procedure to reduce tension in the DDFT. The technique, which they described in the Journal of Equine Veterinary Science, involves injecting a diluted solution of Botox (Botulinum toxin type A) into the deep digital flexor muscle in several places. The skin is clipped and aseptically prepared before injection, and to make sure the muscle is injected correctly they monitor the procedure with an electromyograph (EMG).

They explain that botulinum toxin blocks the release of the neuro-transmitters (acetylcholine) from the nerve endings. This temporarily prevents the muscle contracting.

“The clinical changes are first noted approximately two days later, with peak benefit in approximately two weeks.” The effects gradually wear off after about three months.

In the report, Carter and Renfroe describe several laminitis cases that they have treated using this technique. They feel that the technique has promise, so much so that they have patented it - so no one can use it without authorization.

For more details see:

A novel approach to the treatment and prevention of laminitis: Botulinum Toxin Type A for the treatment of laminitis.

DW Carter, JB Renfroe.

Soaking hay before feeding cannot be relied on to make it safe for laminitis-prone horses, according to a recent study conducted by the Laminitis Consortium.

The Laminitis Consortium comprises equine veterinary, nutrition and research experts interested in collaborating on the important topic of laminitis. It includes the authors of this work: Dr Pat Harris of the WALTHAM® Equine Studies Group, Clare Barfoot of Mars Horsecare UK Ltd and Dr Annette Longland of Equine Livestock and Nutrition Services.

One of the factors that has been recognised as increasing the risk of laminitis is the over consumption of water soluble carbohydrates (WSC).

It has been recommended that obese animals and those at risk of laminitis should be fed hay with a non-structural carbohydrate (WSC and starch) content of less than 10%. Soaking hay in water before being fed has been suggested in order to reduce the WSC.

Previous studies have shown that the prolonged soaking of chopped hay in large volumes of water can result in the leaching of nutrients, including soluble carbohydrates. However, because common practice in the UK tends to involve long-stemmed hay, soaked in relatively small volumes of water over varying timescales, the Laminitis Consortium’s study aimed to replicate such a practice.

The study, which was completed earlier this year, examined the loss of water-soluble carbohydrates from nine different hays submerged in water for up to 16 hours. It was presented to the biannual Equine Science Symposium in America in May 2009. The proceedings of the meeting have been published in the Journal of Equine Veterinary Science.

The nine different hay samples were analysed for WSC and then soaked in cold water. The soaked samples were subsequently analysed after 20
Identification by iris scan.

Equine Science Update

minutes, 40 minutes, three hours and 16 hours.

“The results showed a highly variable leaching of WSC and substantially less leaching than reported previously for chopped hay soaked for 30 minutes” explained Clare Barfoot. “Very few samples reached below 10% WSC, despite prolonged soaking. The concern is that this strongly suggests that soaking may not be sufficient to render some hays safe to feed to horses and ponies prone to laminitis.”

“Our current advice is that ideally you should analyse your hay before feeding it to an animal at high risk of laminitis and choose hay with the lowest WSC content you can find. Soaking hay provides an additional safeguard but should not be relied upon,” concludes Clare.

The study also highlights that if hay is soaked for extended periods, it may not meet the nutritional requirements of the animal because substantial amounts of other nutrients, protein, vitamins and minerals will also be lost. In such cases it is even more important that the horse or pony should receive a balanced supplementary feed.

The Laminitis Consortium is continuing its work in this area and hopes to be able to identify practices that will be of greater benefit to the horse owner faced with hay of unknown WSC content.

For more details see:


Tattoos, brands, passport pictures and microchips may all become things of the past with the advent of iris scanning for horses.

“In the high stakes sport of horse racing, correctly identifying horses is not nearly as fast or simple as it needs to be,” said Mark Clifton, Sarnoff Corporation’s Vice President for Products and Services.

“IT can take more than a half hour to check a horse’s tattoos and markings, or even longer if they’ve faded over time, plus they’re easy to fake” he added. “Sarnoff’s new portable equine Iris ID system, based on decades of vision systems expertise and research, allows users to quickly and accurately identify horses right before a race, without undue stress on the animal.”

The system is based on Sarnoff’s Iris on the Move® (IOM) technology, which can capture iris images of sufficient quality for iris recognition while the subject is moving at a normal walking pace.

It will use a low visibility infrared light source to capture a horse’s iris image from a distance, even while the animal is moving. In this way, the horse is not disturbed or unnecessarily stressed as may occur using today’s methods of identification which often involve tattooing and manually checking marks on horses.
Recent research has confirmed that horses react to nervousness in their rider or handler.

Linda Keeling, Professor of Animal Welfare, at the Department of Animal Environment and Health, led the study at the Swedish University of Agricultural Sciences, Uppsala. The project involved the simultaneous recording of the heart rate of horses and the people riding or leading them. It was carried out in an indoor arena familiar to both the horses and people involved.

Horses were led or ridden over a distance of 30m between two markers. This was repeated four times.

The heart rates of both horse and rider or handler dropped on the second and third pass.

Just before walking the horse past the markers for the last time, the handler or rider was warned that something would happen that could frighten the horse. (An assistant who had been standing at the side of the track would open an umbrella.)

In fact, the frightening event never happened. Even so, the heart rate of the rider or handler increased significantly in anticipation of the expected threat.

The horse’s heart rate also increased. Now obviously the horses knew nothing of the potential threat, other than what they sensed from the person leading or riding them.

“The increase in heart rate probably means that the horses were more alert and prepared to react to any potential danger” Dr Keeling explains. “So a nervous person leading or riding a horse may actually increase the risk of the horse being startled by the thing they want to avoid.”

She suggests that increasing the awareness of the unconscious signals that riders may be giving to a horse, particularly those related to nervousness or anxiety, could help reduce accidents.

For more details see:


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**Equine stereotypies: search for new approach**

Pharmaceutical manufacturer CEVA Animal Health is looking to develop an equine pheromone to be used in the control of stereotypies, and is asking horse owners for help.

Pheromones are substances secreted by the body that have an effect on the behaviour of other animals of the same species. Lactating female mammals release substances called appeasing pheromones. Their function is to calm, and provide reassurance to the offspring, especially in unknown situations. They contribute to the foal bonding with the mare.

Equine appeasing pheromone has been shown to help calm horses in stressful situations. Could it also have a place in modifying stereotypies such as weaving and cribbing?

CEVA Animal Health already markets behaviour modifying products based on pheromones for cats and dogs. These products reproduce natural pheromones that provide a feeling of comfort and help prevent or reduce stress-related behaviours such as urine spraying in cats and firework fears in dogs.

The company is working in partnership with the University of Nottingham’s Veterinary School to carry out initial research in the UK. They are asking owners of horses that display any type of stereotypical behaviour such as crib biting, weaving or box walking to complete a simple online survey about their horse and their management regime.

Liz Mossop BVM&S MRCVS at Nottingham Vet School said “Equine stereotypical behaviour, such as crib biting and weaving, is a difficult problem to manage for many owners. Nottingham Vet School is delighted to be involved with this project which should help to provide some new ideas and answers for both owners and the veterinary surgeons dealing with their horses and ponies. Pheromones have been shown to be very effective in supporting behaviour management of dogs and cats and we hope that an equine pheromone would prove equally useful.”

If you would like to take part please go to

www.nottingham.ac.uk/vet/Horseownersurvey

and click on the survey link. It should take only a few minutes of your time to complete the survey and your involvement would be very much appreciated.
Adverse effects of handling newborn foals

Research suggests that prolonged handling of newborn foals may have lasting detrimental effects on their behaviour.

Dr Séverine Henry and colleagues at EthoS - Ethologie animale et humaine, Université de Rennes 1, (France) examined the short- and long-term effects of prolonged handling of foals just after birth.

They compared two groups of newborn foals. Foals in the experimental group were separated from their mothers (although the mare stayed nearby) and were handled for an hour.

The handling procedure was based on that developed by veterinarian Robert Miller.* It consisted of handling the foals before they stood up. Foals were restrained and kept lying down, while the experimenter stroked them all over their body. They were also exposed to stimuli such as a white towel, a plastic bag and a spray of water. Each stimulus was repeated until the foal remained immobile during the procedure. Foals struggled when being handled, before lying still but with tense muscles.

Foals in the control group were not handled apart from attention to the navel. They were left undisturbed with their mothers.

Foals that were separated from their mothers and handled for an hour shortly after birth showed short and long-term effects on foal-dam attachment and social behaviour.

Obviously, handling significantly delayed the foal standing, sucking and bonding to the mare. But experimental foals also showed short-term disturbances that were not seen in the controls - namely trembling, fast breathing and abnormal sucking activities.

The time taken from standing to sucking was similar in both groups.

The researchers noticed behavioural differences between the two groups, which were still apparent even up to the 12-month stage.

During the suckling period, the handled foals appeared more dependent on their mothers. They tended to stay closer to, and spend more time interacting with, their mothers than with other foals. They also showed longer stress reactions subsequent to weaning. At 12 months of age, they tended to be more aggressive towards other yearlings than were the unhandled foals. These signs of insecure attachment to their mothers and its correlates such as impaired social competences, were present at all ages.

“To our knowledge this is the first demonstration showing that interference during the neonatal stage has lasting and profound effects” they conclude. “This finding opens new research directions for both human and animal studies.”

For more details see:

Doi: 10.1371/journal.pone.0005216

*http://www.robertmmiller.com/equine-behavior.html

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The Foaling Guide.

Waiting for a foal to arrive can be a daunting prospect. The Foaling Guide gives you the background knowledge, information and advice you need to approach the event with confidence.

For more details see:

www.TheFoalingGuide.co.uk
Microchipping horses

Should owners expect any adverse effects from having their horse implanted with a microchip?

Microchips are becoming widely used as a means of identification of horses. They are being evaluated as a permanent means of identification for the National Animal Identification System (NAIS) in the USA. They are now required for issue of equine passports in UK.

Generally, the recommended site of injection is in the nuchal ligament, just below the mane, midway between the poll and the withers, on the left side of the neck. Some breed societies may have slightly different recommendations.

Megan Gerber and colleagues at the Pennsylvania State University Department of Dairy and Agricultural Science, conducted a study to assess the inflammatory response to microchip insertion - and to see if the chips migrated after being inserted.

Eighteen Quarter horses were divided at random into three groups. Seven horses had a microchip implanted. Seven horses were injected with an empty needle. Four horses were left as controls and were not injected at all.

To measure the response to injection, the researchers assessed skin temperature, area of swelling and the pressure needed to evoke a pain response.

The inflammatory reaction that occurred after microchip insertion was similar to that produced by injection with the empty needle.

Individual horses showed a localised increase in temperature after injection. But when the groups were compared statistically there was no increase in temperature in either the horses implanted with the microchip or those injected only with the empty needle.

The micro chipped horses were more sensitive to skin pressure 2 hours and 1 and 3 days after implantation than were the horses injected with the dry needle only.

Swelling was first noticed two hours after injection and had disappeared after three days.

There was no difference in the extent of swelling between the two injected groups.

“Inflammation was more pronounced in horses that were tense during insertion of microchips or needles” Gerber explains. “Those animals that were more tense or jumped during insertion had the largest swelling areas, increased sensitivity and heat around the insertion area.”

The researchers also took radiographs after implantation and 1, 2, 4 and 6 months later to monitor the position of the chip in relation to fourth vertebra. No movement of the chip was detected.

“Horse owners can expect slight swelling to occur and localised heat at the injection site to increase several degrees between 6 hours and three days post injection” they conclude. “There may be increased sensitivity to that area up to three days after insertion.”

“When performed according to standard protocol, microchip insertion is not detrimental to the health of the horse in terms of inflammation or migration.”

For more details:


To see how a microchip is inserted: http://www.aaep.org/microchip_video.htm
Allergic diseases in horses most commonly affect the skin and the respiratory system. They are often treated symptomatically with corticosteroids or antihistamines. But if the allergen (the substance to which the horse is allergic) can be identified, it may be possible to develop a specific treatment.

Perhaps the horse could be prevented from coming in contact with the allergen. Or a vaccine could be produced to try to stimulate a more normal response.

Two methods are commonly used to try to identify the offending allergen. Each has its advantages and disadvantages.

The intra-dermal skin test is the “gold standard” for investigating hypersensitivity reactions. Small amounts of antigen are injected into the skin and the reaction is measured at intervals from 30 minutes to 48 hours. Swelling at the site of injection indicates a positive result. The time at which the reaction is first noticed gives an indication of the type of hypersensitivity that is involved.

Reactions first seen after 30 - 60 minutes represent immediate type I allergic reactions involving IgE antibodies, while those appearing after 4 - 10 hours probably involve IgG antibodies. Reactions occurring after 24 - 48 hours involve cell-mediated (delayed type) hypersensitivity.

The intra-dermal skin test is time-consuming and requires a supply of the test antigens. It tends to be confined to referral institutions, and is not widely available in general veterinary practice.

Another option is to measure the allergen specific IgE antibodies in the blood. This simply requires a blood sample. The analysis is carried out in the laboratory.

Owners are often reluctant to take samples for testing for allergens when the problem first arises because of the cost. So horses may be treated with corticosteroids or antihistamines before further investigation is carried out. But does that drug treatment interfere with the diagnostic tests that are performed?

A study carried out at the Michigan State University College of Veterinary Medicine looked at the effect of corticosteroid (dexamethasone) and anti-histamine (hydroxyzine) on skin and blood tests used to investigate allergies. The results were presented at the Sixth World Congress of Veterinary Dermatology in Hong Kong.

Skin tests and a blood sample for IgE were performed on normal horses before the start of drug treatment and after treatment for a week with either 20mg dexamethasone (20mg injected into muscle once daily) or hydroxyzine (500mg orally twice daily.)

The researchers found that the intradermal skin test response was reduced after treatment with dexamethasone for up to 14 days. Hydroxyzine limited the response for only three days.

Neither of the drug treatments had any effect on the serology results at any time. So, although skin test results were influenced by previous treatment, the results of the blood test were not affected.

Some of the horses had positive reactions to some allergens even though they showed no sign of allergic disease. This shows that a positive reaction, either to the skin test or to the blood allergen test, does not in itself indicate that a problem exists. So the test cannot be relied on to differentiate between normal and diseased horses. But it can be used to support a diagnosis - or to identify allergens that should be avoided or used to produce a vaccine.

For more details see:

Effects of dexamethasone and hydroxyzine treatment on intradermal testing and allergen-specific IgE serum testing in normal horses. A Petersen and HC Schott II Vet Dermatology (2008) 19 (Suppl 1) 25
Anoplocephala perfoliata, the most common horse tapeworm, was for a long time thought to be harmless. It is now known that it may be associated with colic. So it is worth monitoring and preventing heavy infestations.

The eggs are released intermittently, so examining faecal samples may give an unreliable estimate of the level of infection. Faecal samples may appear negative even though tapeworms are present in the horse’s gut.

Scientists in Japan have been looking for a more reliable way of detecting tapeworm eggs. Dr Shin-Ichiro Fukumoto and the research team at the Rakuno Gakuen University School of Veterinary Medicine, Ebetsu, Hokkaido, Japan assessed the value of post-treatment testing of faecal samples.

They used bithionol, an anti-tapeworm drug that is available in a paste formulation in Japan. The faecal tapeworm egg count was carried out using a sucrose flotation (modified Wisconsin) method.

A pilot study involved 12 horses (7 mares and 5 foals). Faecal samples were collected before, and one day after, treating with bithionol. All horses had higher egg counts one day after treatment. This included three horses that had no tapeworm eggs in the faeces when tested before being treated. A larger scale field trial found all of 17 horses positive for tapeworm eggs the day after treatment. (Only 16 horses had worm eggs in faeces before being treated) The egg count had increased to 13 - 19 times the level at 7 days pre-treatment.

When is the best time to collect a sample after treatment? In the field trial the research team collected samples one, two and seven days after treatment. Tapeworm egg counts were dramatically higher on the first day after treatment. By the second day they had fallen back to near pre-treatment levels. A week after treatment, there were few if any tapeworm eggs in the faeces.

The researchers conclude that faecal examination the day after bithionol administration provides a reliable way of diagnosing Anoplocephala perfoliata infection.

For more details:

Evaluation of marked rise in fecal egg output after bithionol administration to horse and its application as a diagnostic marker for equine Anoplocephala perfoliata infection.
Y Sanada, H Senba, R Mochizuki, H Arakaki, T Gotoh, S-I Fukumoto, H Nagahata

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Welfare of European horses transported for slaughter

A recent study highlights concerns about the welfare of horses transported long distances by road for slaughter.

In a letter published in the Veterinary Record, Dr David Marlin and others reveal the extent of welfare problems suffered by such horses.

The study was carried out between March and September 2008. Groups of horses were inspected in Romania before being transported to Italy. Other horses were inspected on arrival at slaughterhouses in Italy. A few horses were observed both before and after transportation.

Many of the horses observed in the study, either at the start of their journey, or on arrival at the slaughterhouse, showed evidence of poor health and welfare.

The researchers observed 1519 horses being loaded onto lorries in Romania. They judged that fourteen percent of the animals were not fit to travel in accordance with EU Council Regulation 1/2005 on the Welfare of Animals during Transport. Both recent and long-term injuries were seen. Lameness was common.

1271 horses were observed on arrival in Italy. Of those, the observers considered that 37% were not fit to travel. Many horses showed clear signs of disease, including coughing and nasal discharge, which would have rendered them unsuitable to enter into the human food chain. One in 3 had recent injuries that were likely to have arisen on the journey. Grazing to the skin from friction with the partitions in the transporters was common.

To improve the welfare of horses transported long distances for slaughter, World Horse Welfare is campaigning for:

• The introduction of a short, finite journey limit for horses being transported for slaughter;
• A minimum space allowance that properly reflects the size of the horse, donkey or pony;
• Improved design of partitions for individual stalls
• Clarification of the definition of “unbroken equidae”
• Detailed journey plans
• Compulsory 24 hour rest periods, off the vehicle for all horses, other than registered animals, when they enter the EU;
• Robust enforcement of the current legislation.

The letter’s authors urge the veterinary profession to support these aims to improve the welfare of horses being transported long distances for slaughter in Europe.

For more details see:

Read more about the World Horse Welfare campaign against long distance transportation to slaughter
http://www.worldhorsewelfare.org/help-tomorrow/long-distance-transportation

For more details of the World Horse Welfare recommendations

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www.equinescienceupdate.co.uk/backissues.htm
Research shows that horses see better at night than we do.

Dr Evelyn Hanggi and Dr Jerry Ingersoll, of the Equine Research Foundation in California, conducted a study to see if horses could distinguish simple geometrical shapes under various low light conditions.

Firstly, they trained the horses to choose between two shapes - a circle and a triangle. If the horse chose the correct shape, by touching it with its nose, it received a reward. Two horses were trained to choose the circle and two the triangle.

If a horse could not differentiate between the shapes, it would be expected to choose the correct card 50% of the time purely by chance. “In reality, chance is higher still, given the number of trials run and the significance level” Dr Hanggi explains. “For a run of 20 trials, horses could still respond by chance at 75%, given an alpha of 0.01. For alpha equal to 0.05, chance would occur at 65%.”

So, to be sure that the horses’ response was not down to chance, the researchers set a target of 80% correct tests before they would conclude that the horse could distinguish the shapes.

Once the horses were trained, the next step was to test if they could still distinguish the shapes under dimly lit conditions.

The lighting was controlled to give conditions ranging from the equivalent of twilight to a dark moonless night in a dense forest.

Hanggi and Ingersoll noticed during early training that it took the horses some time to adapt to dark conditions. When the lights were dimmed quickly, the horses tended to bump into objects or stand still. So they were allowed to stand in the dark for at least 15 minutes before the start of each test.

The results showed that horses were able to see down to very low light levels. They could differentiate between the two shapes in almost complete darkness - something that the human experimenters were unable to do. Only in conditions similar to dense forest with minimal visible sky did the horses lose the ability to distinguish the shapes.

In even darker conditions they could still navigate their way to and from the start point of the test - even when it was so dark that the light meter was off the scale.

It should come as no surprise that horses see better at night than we do. Indeed Dr Hanggi points out that wild mustangs are able to run over rough terrain, dodging sagebrush, rocks hills and gullies their way illuminated only by the stars.

The/horse’s eye is well suited for seeing in the dark. Rods, the light-sensitive cells that are responsive in dim light, outnumber the color-sensitive cones by about 9:1.

The eye also has a reflective layer, the tapetum lucidum, which reflects light back through the retina increasing the light available to the light responsive cells. While increasing the sensitivity to dim light, the tapetum lucidum also reduces discrimination ability in some species due to light scattering.

Dr Hanggi adds “Our research not only provided scientific evidence that horses see very well in the dark (which many horse people already know), it also showed that they can discriminate individual objects in very low light conditions (which most people probably don’t know).”

For more information on the Equine Research Foundation see:
http://www.equineresearch.org

For more details see:
Stimulus discrimination by horses under scotopic conditions.
EB Hanggi, JF Ingersoll