The Modern Equine Vet

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What to Do With An Elevated GGT?

Can We Reduce Transmission of EIV?

How Do You Feel About Facial Hair?

Night Blindness

The Joy of Feeding

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What to Do With an ELEVATED GGT?

By Marie Rosenthal MS

It can be tricky to figure out what is wrong with a sport horse that is a little "off," but with no outward appearance of illness, especially if liver disease is suspected because the animal has an elevated gamma-glutamyl transferase (GGT) result.

"It's a little bit of a blurry situation, and that is the difficulty that we face. We have horses that are not outwardly sick," explained **Emmanuelle van Erck-Westergren**, DVM, PhD, ECEIM, ECVSMR, the owner of the Equine Sports Medicine practice, in Belgium.

"These are athletic horses, so they can continue working, they can continue participating in competitions, and your job is to try and link whatever comes up in the blood sample to what the horse is actually expressing."

Unfortunately, several things can elevate GGT, including stress, she said at the British Equine Veterinary Association Congress 2023, held in Liverpool, England.

Active equine athletes frequently have a mix of biliary or hepatocellular enzymes in their blood, so she recommended when working up a horse to have some idea of what the issue might be before taking a blood sample. "If you are going on a fishing expedition, it is not very valuable. It's good to know what you're expecting. So, in regular horses, not top-level athletes, if I have an increase in GGT for instance, I would think more of hepatobiliary disease, inflammation of the digestive tract, such as IBD [irritable bowel disease] or horses that have parasites," she said. Horses with pituitary pars intermedia dysfunction also can have elevated GGT values.

GGT can be a marker of workload overload, too. Several papers have described the GGT syndrome, which is a mild to moderate increase of just the GGT that is not associated necessarily to an increase in other enzymes, and there is no histological evidence of liver damage. It seems entirely linked to how much exercise the horse is getting, a possible maladaptation to training and oxidative stress.

"Oxidative stress occurs when the body uses oxygen for metabolism. More than 80% of a body's oxygen intake goes into fueling the body, but 2% becomes reactive-oxygen molecules, which are very unstable with a free electron tries to interact with the environment to stabilize itself. It can interact with cell membranes and destroy these cell membranes by damaging the lipids. They can also damage proteins or enzymes. They can cause DNA mutations, and they are responsible for aging processes," she explained.

In horses, several studies have shown that the more intense the exercise or training and conditioning practices are, the higher the oxidative stress burden. Some researchers think that oxidative stress could be a marker of overtraining.

"And this is where GGT is interesting because there is a correlation between levels of oxidative stress and GGT values," Dr. van Erck-Westergren said.

But how useful is this information in determining what is happening to the horse standing in front of you looking a little off.

She said one paper was interesting. Mann, et al.

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SIGN OF MALADAPTATION
Assess conditioning and competition schedules

SIGN OF DIET OVERLOAD AND TOXINS
Assess diet, paddock, forage type and storage

SIGN OF INFESTATION OR INFECTION
Assess worming, hepatic viruses

RUN ANCILLARY EXAMS IF NEEDED

looked at horses that were on the same premises and took horses that had high GGT values above 50 IU/liter, which is not a signal necessarily of liver disease, but is high enough to be abnormal. They compared them with horses that were below 36 units. They looked at targeted metabolomics to if there were processes that were associated with these increases in GGT and then also tested for viral hepatic viruses. They found abnormal values even in young horses in training. Their markers of oxidative stress correlated with elevated GGT. There was also a mild indication of cholestasis and no association with either equine hepaciviral or parvoviruses.

In a second part of the study, they looked at other parameters like levels of vitamin B6 and selenium, which are natural antioxidants, and found the horses with high GGT had significantly lower values of B6 and selenium.

This makes sense when one looks at the current competition schedules, she explained. The competition seasons are longer. Often, these horses have no down time.

"I wouldn't be able to go 2 years without having a holiday or having a weekend off, but some of the horses are constantly on the road going to competitions, and that is certainly some of the horses for whom we see an increase in oxidative stress markers, and maybe GGT," Dr. van Erck-Westergren said.

Check out the environment and feeding protocols, and take a look at its feed or pasture if you can.

She discussed horses that were having a bad year. They were younger horses that seem to be physically affected with duller coats and loss of muscle. They had low white blood cell counts, and most of the horses showed high GGT values.

The trainer talked to the owners about training too hard and giving the animals a break.

Outside of lameness, fungi are a major cause of poor performance. Check out the feed room and do some calculations to figure out what the horse needs.

They tested the feed for fungi and switched to a commercial feed from oats and switched the bedding to wood shavings instead of straw. She said, in addition, steaming the hay used for bedding is the best thing to do if fungi are a concern "because it eliminates both molds and bacteria."

Also look at any supplements that trainers are giving. In this case, the trainer was giving up to 900 mLs of oil mixed in the food, which she described as a huge amount. "We took away the oil which he had given to increase the energy levels based on the recommendations of a friend. And that's how we got to the bottom of it," she said.

As a result, the owner almost tripled his prize money from in comparison to 2019.

"Other associations, which I'd like you to make is if your athletic horses have access to pasture, go and have a look at the pastures. You must see what kind of different plants you have in that pasture," she said, adding ragwort is a big concern.

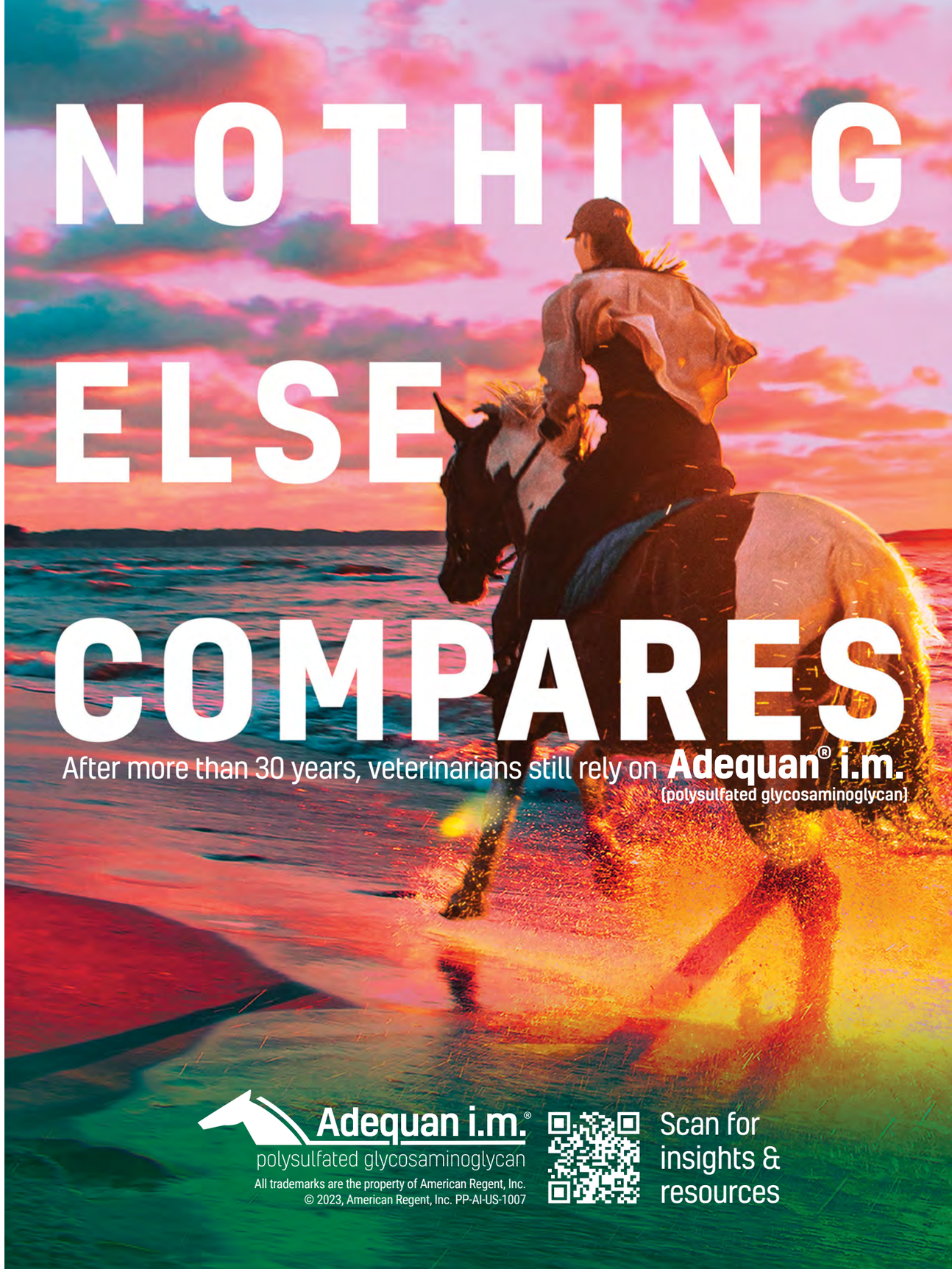
Look for signs of infection or infestation. And run some tests. "Unless we actually test for them, we won't be able to know to what extent they're affecting our horses," she said.

"Think not just about the individual, think about the herd as well," she said.

"If I have increased liver enzymes in the equine athlete, should I worry? Well, it is the sign that something is going on," she said. Look at the individual horse, its schedule, environment, feed, as well as the herd to get a fuller picture. **MeV**

For more information:

Mann S, Abuelo A, Stokol T, et al. Case-control exercise challenge study on the pathogenesis of high serum gamma glutamyl transferase activity in racehorses. *Equine Vet J.* 2023;55(2):182-193. **https://beva.onlinelibrary.wiley.com/doi/10.1111/evj.13584**



Genetic Cause of Night Blindness Confirmed in Tennessee Walking Horses

By Liza Crissiuma Gershony

New collaborative research led by **Rebecca Bellone,** PhD, director of the UC Davis Veterinary Genetics Laboratory (VGL) provided further evidence that the CSNB2 allele causes congenital stationary night blindness (CSNB) in the Tennessee Walking Horse.

Researchers also detected the CSNB2 allele in 9 other horse breeds and confirmed that Standardbred and the Missouri Fox Trotting Horse who were homozygous for CSNB2 (those with 2 copies of the CSNB2 allele) also suffered night blindness, which refers to the inability to see in low-light conditions, such as at night or at dusk.

TABLE 1. CSNB2 genotypes and allele frequencies from the investigated horses, and the expected carrier and CSNB-affected frequencies for each breed.

CSNB2 allele frequencies and expected number of CSNB homozygotes (affected) by breed			
Breed	n	CSNB2 Allele Frequency	Expected CSNB Affected Frequency
Miniature Horse	99	1.0%	0.01%
Missouri Fox Trotting Horse	89	8.4%	0.71%
Morgan	330	1.4%	0.02%
American Quarter Horse	486	0.10%	0.0001%
Racking Horse	58	10%	1.1%
Rocky Mountain Horse	74	0.68%	0.005%
American Saddlebred	92	0.54%	0.003%
Spotted Saddle Horse	55	10%	1.0%
Standardbred (pacer)	110	17%	3.0%

Affected horses may have difficulty finding feed buckets and navigating at night and are prone to injuring themselves. No treatment is available for CSNB, but affected horses can be managed by providing a light source to help them navigate at night.

The study built upon previous work that identified a single nucleotide polymorphism (SNP) in the glutamate metabotropic receptor 6 (*GRM6*) gene as a likely causal of CSNB in a Tennessee Walking Horse. This variant was called CSNB2 because it is the second variant identified to cause CSNB in horses; the first of which was LP.

The recent study confirmed that CSNB2 is inherited as an autosomal recessive trait, meaning that only homozygous horses (CSNB2/CSNB2) are affected by CSNB, and heterozygous or "carrier" horses (CSNB2/N) are not affected. The researchers performed ocular examinations including electroretinography (ERGs) on 3 CSNB2/CSNB2 homozygous horses and found all 3 to be affected by CSNB (one Standardbred, one Missouri Fox Trotting Horse, and an additional Tennessee Walking Horse). Additionally, 7 CSNB2/N heterozygous horses and 9 N/N horses underwent the same examinations and ERGs, and were determined to be unaffected by CSNB. These findings support 2 copies of CSNB2 are causative for CSNB in horses.

Researchers found the allele frequency of CSNB2 ranged from 0.0010 in Quarter Horses to 0.17 in pacing bred Standardbreds (Table 1). Overall, the highest allele frequency was found in pacing Standardbreds, with more than 1 in 4 (29%) pacing bred Standardbreds expected to be carriers of the CSNB2 allele, and 1 in 33 (3.0%) expected to be affected by CSNB. The CSNB2 was only identified in the pacing subpopulation of Standardbreds, and not in the trotting subpopulation.

"Many Standardbreds race at night. It is currently unknown if CSNB2 impacts racing performance. Therefore, routine testing for CSNB2 is recommended for pacing Standardbreds and careful management decisions need to be considered for those that test homozygous (CSNB2/CSNB2)" advised Dr. Bellone, a professor in the Department of Population Health of Reproduction and equine geneticist who has been studying the genetics of ocular disorders in horses for nearly 20 years.

This is the first report with clinical confirmation of CSNB in Standardbreds and Missouri Fox Trotting Horses, suggesting the condition has been significantly underdiagnosed.

"Previous studies have indicated that other breeds aside from LP spotted horses had night blindness, but this is the largest across breed study to investigate this disorder in horses and highlights the need for further study," said **Sara Thomasy**, DVM, PhD, DACVOa professor of Comparative Ophthalmology at University of California, Davis. **MeV**

The study was supported by funding from the United States Trotting Association and the UC Davis Center for Equine Health. Affected horses should receive an ocular examination including electroretinography (ERG) performed by an ACVO board-certified veterinary ophthalmologist (https://www.acvo.org/ophthalmologist-search).

For more information:

Esdaile E, Knickelbein KE, Donnelly CG, et al. Additional evidence supports GRM6 p.Thr178met as a cause of congenital night blindness in three horse breeds. *Vet Ophthalmol*. 2023 Oct. 10.

https://onlinelibrary.wiley.com/doi/10.1111/vop.13151

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[1] Equine Mega Study, Brakke Consulting, 2023.

[2] Hunyadi L, Papich MG, Pusterla N. Pharmacokinetics of a low-dose and DA-labeled dose of diclazuril administered orally as a pelleted top dressing in adult horses. *J of Vet Pharmacology and Therapeutics* (accepted) 2014, doi: 10.111/jvp.12176. The correlation between pharmacokinetic data and clinical effectiveness is unknown.

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MERCK Animal Health

New Saddle-Mapping Technology May Reduce Back Pain

Equine back pain is prevalent in at least 35% of ridden horses and often is attributed to poor saddle fit.

A new method for scanning moving horses has enabled **Jorn Cheney**, PhD, a researcher of animal locomotion at the University of Southampton, England, to produce an enhanced saddle-map that can reduce back pain for horses. This map identifies the most and least mobile areas of a horse's backs while walking and trotting, which may lead to improvements in saddle design and fitting methods.

Current practice for fitting saddles to horses is done on standing animals, but that does not account for how the saddle will change position as the horse moves, according to Dr. Cheney, who presented the data at the Society for Experimental Biology Conference 2023, held in July in Edinburgh, Scotland.

"We were surprised to see that the shape of the standing animal was substantially different from the stride-averaged shape of the moving animal," Dr. Cheney said. "We expected a difference, just not to the extent that we saw."

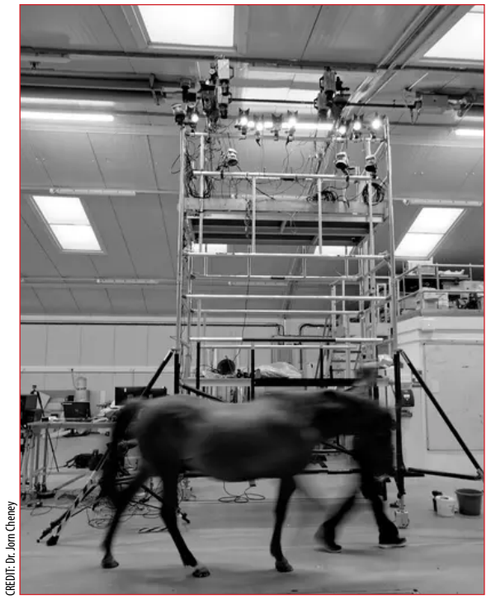
Dr. Cheney and his team measured the change in the shape of horse's backs by filming them walking and trotting with an array of cameras. They then reconstructed the saddle region as it morphed throughout the stride and tracked the movement of the limbs using a technique known as videogrammetry.

The product of these measurements is a "saddle-map" that highlights ideal areas for saddle placement to reduce the chances of pain or injury for the horse. One area of the horse's back, known as the withers, is located just above and behind the shoulder blades and was found to move up and down a few centimeters during movement compared with standing still.

"My research measures the shape of saddle region—as the horse walks and trots—to understand how the muscles bulge and the spine bends so that we can integrate that knowledge into better saddle design," Dr. Cheney said. "A poor interface between a saddle and a horse's back can lead to severe tissue damage in horses, even the wastage and loss of whole muscles in the back."

This research also found that the least mobile areas of the horse's back are the most appropriate for distributing pressure, while repeated application of high pressure and soft tissue movement in the most mobile areas can lead to pain and tissue damage.

"Among the outcomes of this research will be new design and fitting guidance for saddlers," said Dr. Cheney, who is working with master saddlers to ensure that the new fitting guidance is in line with professional approaches to saddling and industry philosophy. **MeV**



CREDIT: Dr. Jorn Cheney

Horse moving through the camera setup to determine saddle fit.

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DESCRIPTION
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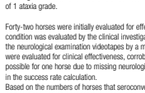

Diclazuril is an anticoccidial (antiprotozoal) compound with activity against several genera of the phylum Apicomplexa. PROTAZIL® (diclazuril) is supplied as oral pellets containing 1.56% diclazuril to be mixed as a top-dress in feed. Inert ingredients include dehydrated alfalfa meal, wheat middlings, cane molasses and propionic acid (preservative).

INDICATIONS
PROTAZIL® (1.56% diclazuril) Antiprotozoal Pellets are indicated for the treatment of equine protozoal myeloencephalitis (EPM) caused by Sarcocystis neurona in horses.

DOSAGE AND ADMINISTRATION
Dosage: PROTAZIL® (1.56% diclazuril) is administered as a top dress in the horse's daily grain ration at a rate of 1 mg diclazuril per kg (0.45 mg diclazuril/lb) of body weight for 28 days. The quantity of PROTAZIL® necessary to deliver this dose is 64 mg pellets per kg (29 mg pellets/lb) of body weight.

Administration: To achieve this dose, weigh the horse (or use a weigh tape)). Scoop up PROTAZIL® to the level (cup mark) corresponding to the dose for the horse's body weight using the following chart:

Weight Range of Horse (lb)	mLs of Pellets	Weight Range of Horse (lb)	mLs of Pellets
275 - 524	20	1275 - 1524	60
525 - 774	30	1525 - 1774	70
775 - 1024	40	1775 - 2074	80
1025 - 1274	50	-	-

One 2.4-lb bucket of PROTAZIL® will treat one 1274-lb horse for 28 days. One 10-lb bucket of PROTAZIL® will treat five 1100-lb horses for 28 days.

CONTRAINDICATIONS
Use of PROTAZIL® (1.56% diclazuril) Antiprotozoal Pellets is contraindicated in horses with known hypersensitivity to diclazuril.

WARNINGS
For use in horses only. Do not use in horses intended for human consumption. Not for human use. Keep out of reach of children.

PRECAUTIONS
The safe use of PROTAZIL® (1.56% diclazuril) Antiprotozoal Pellets in horses used for breeding purposes, during pregnancy, or in lactating mares has not been evaluated. The safety of PROTAZIL® (1.56% diclazuril) Antiprotozoal Pellets with concomitant therapies in horses has not been evaluated.

ADVERSE REACTIONS
There were no adverse effects noted in the field study which could be ascribed to diclazuril. To report suspected adverse reactions, to obtain a MSDS, or for technical assistance call **1-800-224-5318**.

CLINICAL PHARMACOLOGY
The effectiveness of diclazuril in inhibiting merozoite production of Sarcocystis neurona and S. falcatula in bovine turbinate cell cultures was studied by Lindsay and Dubey (2000.1 Diclazuril inhibited merozoite production by more than 80% in cultures of S. neurona or S. falcatula treated with 0.1 ng/mL diclazuril and greater than 95% inhibition of merozoite production (IC95) was observed when infected cultures were treated with 1.0 ng/mL diclazuril. The clinical relevance of the in vitro cell culture data has not been determined.

PHARMACOKINETICS IN THE HORSE
The oral bioavailability of diclazuril from the PROTAZIL® (1.56% diclazuril) Antiprotozoal Pellets at a 5 mg/kg dose rate is approximately 5%. Related diclazuril concentrations in the cerebrospinal fluid (CSF) range between 1% and 5% of the concentrations observed in the plasma. Nevertheless, based upon equine pilot study data, CSF concentrations are expected to substantially exceed the in vitro IC95 estimates for merozoite production (Dirikolu et al., 1999)2. Due to its long terminal elimination half-life in horses (approximately 43-65 hours), diclazuril accumulation occurs with once-daily dosing. Corresponding steady state blood levels are achieved by approximately Day 10 of administration.

EFFECTIVENESS
Two hundred and fourteen mares, stallions, and geldings of various breeds, ranging in age from 9.6 months to 30 years, were enrolled in a multi-center field study. All horses were confirmed EPM-positive based on the results of clinical examinations and laboratory testing, including CSF Western Blot analyses. Horses were administered PROTAZIL® (1.56% diclazuril) Antiprotozoal Pellets at doses of 1, 5, or 10 mg diclazuril/kg body weight as a top-dress on their daily grain ration for 28 days. The horses were then evaluated for clinical changes via a modified Mayhew neurological scale on Day 48 as follows:

0. Normal, neurological deficits not detected.
1. Neurological deficits may be detectable at normal gaits; signs exacerbated with manipulative procedures (e.g., backing, turning in tight circles, walking with head elevation, truncal swaying, etc.).
2. Neurological deficit obvious at normal gaits or posture; signs exacerbated with manipulative procedures.
3. Neurological deficit very prominent at normal gaits: horses give the impression they may fall (but do not) and buckle or fall with manipulative procedures.
4. Neurological deficit is profound at normal gait: horse frequently stumbles or trips and may fall at normal gaits or when manipulative procedures were utilized.
5. Horse is recumbent, unable to rise.

Each horse's response to treatment was compared to its pre-treatment values. Successful response to treatment was defined as clinical improvement of at least one grade by Day 48 ± conversion of CSF to Western Blot-negative status for S. neurona or achievement of Western Blot-negative CSF status without improvement of 1 ataxia grade.

Forty-two horses were initially evaluated for effectiveness and 214 horses were evaluated for safety. Clinical condition was evaluated by the clinical investigator's subjective scoring and then corroborated by evaluation of the neurological examination videotapes by a masked panel of three equine veterinarians. Although 42 horses were evaluated for clinical effectiveness, corroboration of clinical effectiveness via videotape evaluation was not possible for one horse due to missing neurologic examination videotapes. Therefore, this horse was not included in the success rate calculation.
Based on the numbers of horses that seroconverted to negative Western Blot status, and the numbers of horses classified as successes by the clinical investigators, 28 of 42 horses (67%) at 1 mg/kg were considered successes. With regard to independent expert masked videotape assessments, 10 of 24 horses (42%) at 1 mg/kg were considered successes. There was no clinical difference in effectiveness among the 1, 5, and 10 mg/kg treatment group results.
Adverse events were reported for two of the 214 horses evaluated for safety. In the first case, a horse was enrolled showing severe neurologic signs. Within 24 hours of dosing, the horse was recumbent, biting, and exhibiting signs of dementia. The horse died, and no cause of death was determined. In the second case, the horse began walking stiffly approximately 13 days after the start of dosing. The referring veterinarian reported that the horse had been fed grass clippings and possibly had laminitis.

ANIMAL SAFETY
PROTAZIL® (1.56% diclazuril) Antiprotozoal Pellets were administered to 30 horses (15 males and 15 females, ranging from 5 to 9 months of age) in a target animal safety study. Five groups of 6 horses each (3 males and 3 females) received 0, 5 (5X), 15 (15X), 25 (25X) or 50 (50X) mg diclazuril/kg (2.27mg/lb) body weight/day for 42 consecutive days as a top-dress on the grain ration of the horse. The variables measured during the study included: clinical and physical observations, body weights, food and water consumption, hematology, serum chemistry, urinalysis, fecal analysis, necropsy, organ weights, gross and histopathologic examinations.
The safety of diclazuril top-dress administered to horses at 1 mg/kg once daily cannot be determined based solely on this study because of the lack of an adequate control group (control horses tested positive for the test drug in plasma and CSF). However, possible findings associated with the drug were limited to elevations in BUN, creatinine, and SDH and less than anticipated weight gain. Definitive test article-related effects were decreased grain/top-dress consumption in horses in the 50 mg/kg group. In a second target animal safety study, PROTAZIL® (1.56% diclazuril) Antiprotozoal Pellets were administered to 24 horses (12 males and 12 females, ranging from 2 to 8 years of age). Three groups of 4 horses/sex/group received 0, 1, or 5 mg diclazuril/kg body weight/day for 42 days as a top-dress on the grain ration of the horse. The variables measured during the study included physical examinations, body weights, food and water consumption, hematology, and serum chemistry. There were no test article-related findings seen during the study.

STORAGE INFORMATION
Store between 15°C to 30°C (59°F to 86°F).

HOW SUPPLIED
PROTAZIL® (1.56 % diclazuril) Antiprotozoal Pellets are supplied in 2.4-lb (1.1 kg) and 10-lb (4.5 kg) buckets.

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1Lindsay, D. S., and Dubey, J. P. 2000. Determination of the activity of diclazuril against Sarcocystis neurona and Sarcocystis falcatula in cell cultures. J. Parasitology, 86(1):164–166.

2Dirikolu, L., Lehner, F., Nattrass, C., Bentz, B. G., Woods, W. E., Carter, W. E., Karpiesiuk, W. G., Jacobs, J., Boyles, J., Harkins, J. D., Granstrom, D. E. and Tobin, T. 1999. Diclazuril in the horse: Its identification and detection and preliminary pharmacokinetics. J. Vet. Pharmacol. Therap. 22:374–379.

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Understand Their **Cost Stress**

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Have Empathy For Their **Financial Struggles**

26% of horse owners borrow from friends or family when faced with an expense they can't pay for.

Educate Them On Your **Payment Options**

54% of horse owners don't know what financing options their veterinarian provides.

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Source: CareCredit Equine Lifetime of Care Study, 2023.

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Facial Hair Trimming Ban

Only 30% of Australian Show Horse Owners Agree

Only 30% of show-horse owners surveyed in Australia agreed with a ban on the trimming of facial hair prior to its implementation in July 2022, according to new research published in the CABI journal *Human-Animal Interactions*.

The research found that when asked if facial hair trimming should be banned in all equine competitions, most disciplines broadly agreed (60.5% to 84.6%) apart from showing with only 22.9% of respondents agreeing with a ban.

However, in response to the question on whether facial hair trimming should be banned only in elite sports, all disciplines disagreed strongly with this statement.

The study highlighted that those who entered horses into show competitions believed they were more likely to win if they trimmed their horse's muzzle and ear hair, and that the practice was normal and common place in their discipline. Some who took part in the research believed that horses did not need muzzle or ear hairs for day-to-day living.

Despite this, equine organizations from around the world, including Australia, have banned the practice at competitions on welfare grounds, because the hairs located around the muzzle and eyes have sensory functions that are important to horses.

The hairs are needed to help identify textures of grass and to aid spatial awareness and environmental navigation, which is impeded by blind spots in front of their foreheads and below their noses.

Scientists from the University of Adelaide and the University of Newcastle, Australia, surveyed 422 horse owners from Australia of which 85% entered their horses into competitions with showing and dressage being the 2 most popular types.

Most respondents were female (96%) and lived in South Australia (56%) with a good spread of ages from 18-24 to 55-64, and fewer older than 65 years.

The study sought to determine the proportions of horse owners trimming equine facial hairs (ear and muzzle hair) across different types of equestrian disciplines in Australia, the types of facial hairs trimmed, whether horses were restrained for trim-

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1. Zycosan® Freedom of Information Summary NADA 141-559

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ming and attitudes related to the practice.

"The results of this study provide valuable insight into the widespread trimming of horse muzzle and ear hairs in some horse disciplines prior to the implementation of the ban in Australia in July 2022," said **Kirrilly Thompson**, PhD, a co-author on the paper, from the University of Newcastle, Australia.

"The information gained may also be useful for the design and implementation of behavior change interventions for other management and presentation practices used for horses and other animals."

The German Equestrian Federation was the first federation to ban the trimming of whiskers and ear hairs in competitive horses—making it illegal in 1998. The International Equestrian Federation then passed a ban—except for where individual sensory hairs have been removed by a veterinarian to prevent pain or discomfort to the horse—in July 2020.

British Dressage in its 2022 rule change banned the practice of trimming facial hairs stating: "Trimming of the horse's sensory hairs around the mouth, nose, eyes and ears is not permitted as this may reduce the horses' sensory ability."

The researchers highlighted that there has been limited studies into how people trim facial hair in horses and attitudes to this practice. Their study provides preliminary results about how widespread the practice was in Australian equestrian sports prior to a ban being introduced, and the reasons and attitudes people in the equine industry have to the trimming of horse facial hairs.

"Further studies are needed to determine if and how the practice and attitudes to facial hair trimming in horses have changed with the enforcement of the ban," said Susan Hazel, PhD, lead author of the research from the University of Adelaide.

"Findings from the present study, however, may also be useful for understanding and addressing other non-regulated horse presentation practices that can compromise welfare, such as clipping hair from the ear canal and 'pulling' manes and tails." **MeV**

For more information:

Hazel S, Holman C, Thompson K. What's the fuzz: The frequency, practice and perceptions of equine facial hair trimming revealed in survey of horse owners in Australia. *Human-Animal Interactions*. 2023 Jun 15. Epublication doi: 10.1079/hai.2023.0023.
https://www.cabidigitallibrary.org/doi/10.1079/hai.2023.0023

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Injection site reactions were the most frequently reported adverse reactions in the field study. Injection site reactions were associated with clinicopathology changes in some cases. Other adverse reactions reported in more than one horse were prolongation of coagulation parameters (activated partial thromboplastin time (aPTT) and prothrombin time (PT)), lethargy, behavior changes, and colic.
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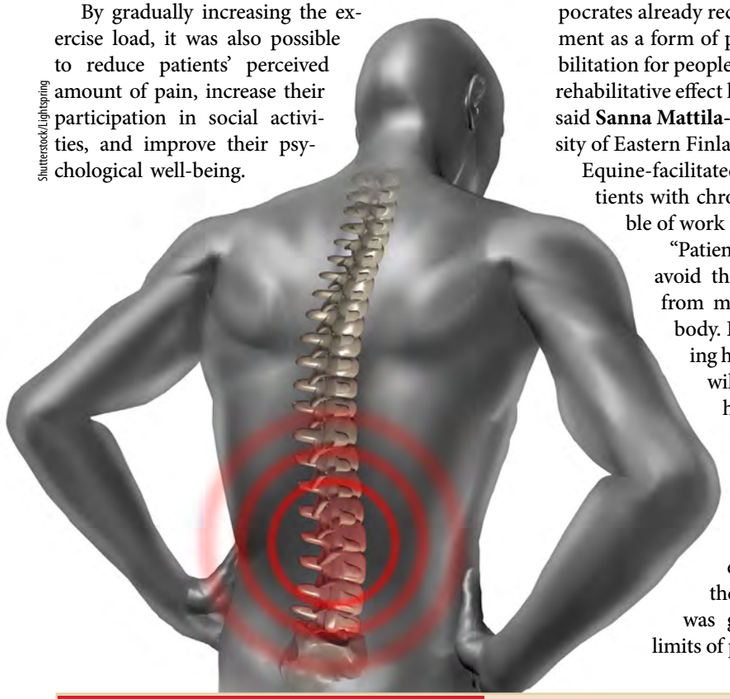
Equine-Facilitated Therapy Improved Functioning of People With Low Back Pain

Patients with chronic low back pain may benefit from equine-facilitated therapy (EFT), a new study from the University of Eastern Finland shows. During a 12-week intervention, the perceived amount of pain decreased, and the ability of daily functioning improved among EFT participants.

The study set out to evaluate the impact of EFT on perceived physical performance, level of pain, pain acceptance, depression and anxiety, and quality of life. The study was conducted in Finland, and it involved a total of 22 men and women suffering from low back pain.

The 12-week intervention showed that EFT can be used to improve people's daily functioning. Statistically significant improvement was observed in domains pertaining to sleep, reaching and bending forward, and standing for long periods.

By gradually increasing the exercise load, it was also possible to reduce patients' perceived amount of pain, increase their participation in social activities, and improve their psychological well-being.



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During a 6-month follow-up, only 2 of the chronic pain patients returned to the clinic due to pain.

In the follow-up interviews, patients highlighted the perceived physical, psychological and social effects of EFT, showing that the intervention had a comprehensive impact on their rehabilitation.

Statistically significant quantitative improvement was observed for mental health: during the intervention, patients' social functioning and depression improved.

"Chronic back pain is a multidimensional experience involving not only physical pain but also learned thinking patterns and emotional reactions. Traditionally, physical therapy has been recommended for the rehabilitation of patients with chronic pain, as physical exercise has been found to be the most effective way to treat spinal pain. Hippocrates already recommended using equine movement as a form of physical and psychological rehabilitation for people, but the exact reason behind the rehabilitative effect has remained unknown thus far," said **Sanna Mattila-Rautiainen**, PhD, of the University of Eastern Finland.

Equine-facilitated therapy brought relief to patients with chronic pain who had been incapable of work for several years.

"Patients with chronic pain tend to avoid the sensation of pain that comes from moving the affected part of their body. However, when sitting on a moving horse, a person with low back pain will end up moving to the gait of the horse, which encourages the right kind of lumbar movement," Dr. Mattila-Rautiainen said.

The compatibility of the patient with the horse's movements, along with a suitable exercise load, played a key role in the intervention. The exercise load was gradually increased, within the limits of pain. **MeV**

For more information:

Mattila-Rautiainen S. Venojärvi, Rautiainen H, et al. The impact on physical performance, pain and psychological wellbeing of chronic low back pain patients during 12-weeks of equine-facilitated therapy intervention. *Front Vet Sci.* 2023 Mar 14. doi: 10.3389/fvets.2023.1085768
https://www.frontiersin.org/articles/10.3389/fvets.2023.1085768/full

Can We Reduce Transmission of EIV?

An analysis of the influenza A virus, H3N8, which spilled over from horses to dogs suggests that host population and epidemiology are driving the sustained transmission of equine influenza virus (EIV) clade FC1 among horses.

The data suggest "that well-targeted interventions could in turn result in the extinction of EIV H3N8 FC1 in horses," the researchers wrote. They advocated for screening horses that travel internationally for influenza before entering a new country, which could reduce transmission worldwide.

"Rational human intervention may be necessary to 'break' the host-structure epidemiology that is sustaining this virus," they wrote.

A recent publication by **Brian Wasik**, PhD, a research associate in the Parrish Lab at the Baker Institute for Animal Health, at Cornell University, and colleagues investigated the influenza virus that jumped from horses to dogs in the early 2000s to see the epidemiological differences between the 2 hosts. They reviewed genomic data of H3N8 in both species from Cornell sequencing and public repositories starting around 2001.

In this case, this strain of CIV did eventually die out among canines, but has not died out among equines, according to the analysis.

Experts believe H3N8 EIV was introduced to Florida from South America in 1963, and it continues to circulate among horses today. Around the year 2000, the H3N8 EIV strain divided into 2 clades: the Florida Clade 1 (FC1), which primarily affected horses in North America and Florida Clade 2 (FC2), which primarily affects horses in Europe. Although these clades have kept some degree of geographic separation and are not considered competitive with each other, both clades have been seen worldwide, the researchers found.

The incidence of EIV among U.S. horses is less than 10% with seasonal variability, according to voluntary surveillance from the voluntary Equine Respiratory Biosurveillance Program, supported by Merck Animal Health, and lead by **Nicola Pusterla**, DVM, DACVIM, and the UC Davis Equine Infectious Disease Research Laboratory. About 60% of equine operations administer EIV vaccines, which include antigens from the most commonly circulating strains.

Canine Flu Offers Clues

The H3N8 EIV spillover to dogs probably occurred around 1999, and in 2003, the infection was diagnosed among racing greyhounds in a Florida training facility, and it is believed that they spread CIV to several regions of the country. Subsequent transmission occurred among dogs in dense populations, such as animal shelters, kennels and doggie day care centers. It was particularly persistent in the Central and Eastern regions of the country. Scattered outbreaks also were reported in the United Kingdom, Australia and a few other countries. However, by 2016, the H3N8 strain of CIV appeared to become extinct among dogs, according to the researchers.

"Both horses and dogs can be mammalian hosts to influenza viruses. Sometime around 2000 an influenza circulating in horses (H3N8) spilled over into dogs, likely among greyhounds in Florida. Subsequent outbreaks around the United States established the first established Canine Influenza Virus of the modern era. Our last detection of H3N8 canine influenza was in 2016. Our study meant to ask if this apparent 'extinction' of canine influenza had to do with the virus itself or to the nature of the 2 host species," Dr. Wasik explained.

"Our findings, coming from full genome genetic analysis, identified that differences in virus evolution were minimal. We further found that canine influenza was limited geographically, being confined to shelters in major metropolitan centers. In contrast, equine influenza continues to spread near globally and the major clade of the virus appears to be maintained by circulation within the United States. International transfer of horses links equine influenza viruses across continents. Our results suggest that an improved understanding of horse population dynamics and stakeholder cooperation could empower the veterinary world to reduce the burden of equine influenza through screening, quarantine and improved vaccination strategies." **MeV**

For more information:

Waski BR, Rothschild E, Voorhees IEH, et al. Understanding the divergent evolution and epidemiology of H3N8 influenza viruses in dogs and horses. *Virus Evol*. 2023;9(2):vead052. **https://doi.org/10.1093/ve/vead052**

Feeding Method Affects Equine Health, Well-Being

Different feeding methods have different effects on equine health and well-being, according to a recent study, sponsored by Morris Animal Foundation.

Feral and wild horses can spend about 16 hours per day grazing. Changing their access to food affects their natural behavior and leads to health problems.

To understand these changes better and how they might affect domesticated horses, Morris Animal Foundation-funded researchers looked at several feeding methods including free-choice feeding or unlimited food access, slow-feeder, which also allows unlimited hay access but requires the horse to pull hay through a net, and an automatic box feeder.

They divided 15 polo horses into 3 groups—automatic box feeders, slow feeders and allowing horses free choice—to see their effects on the horses' cortisol levels, circadian rhythm and behavior. The horses were fed by 1 method for 15 days, when body weight was measured, and blood was collected before being switched to another form of feeding. Behavior was assessed during the last 24 hours of each feeding method.

Horses using automatic boxes and slow feeders consumed less and exhibited slower weight gain. Both methods effectively regulated food intake. Horses with the freedom to choose when to eat ate more hay than the others, and saw the highest weight gain rates, suggesting that this approach might not be optimal for overweight horses. Horses with access to free choice feeding or a slow feeder spent more than half their day doing natural activities such as foraging.

Conversely, horses using the box feeder spent only about a quarter of their day eating, and this treatment increased the time that horses spent standing, sniffing the ground and ingesting their own feces. Furthermore, horses using the box feeder displayed more signs of aggression.

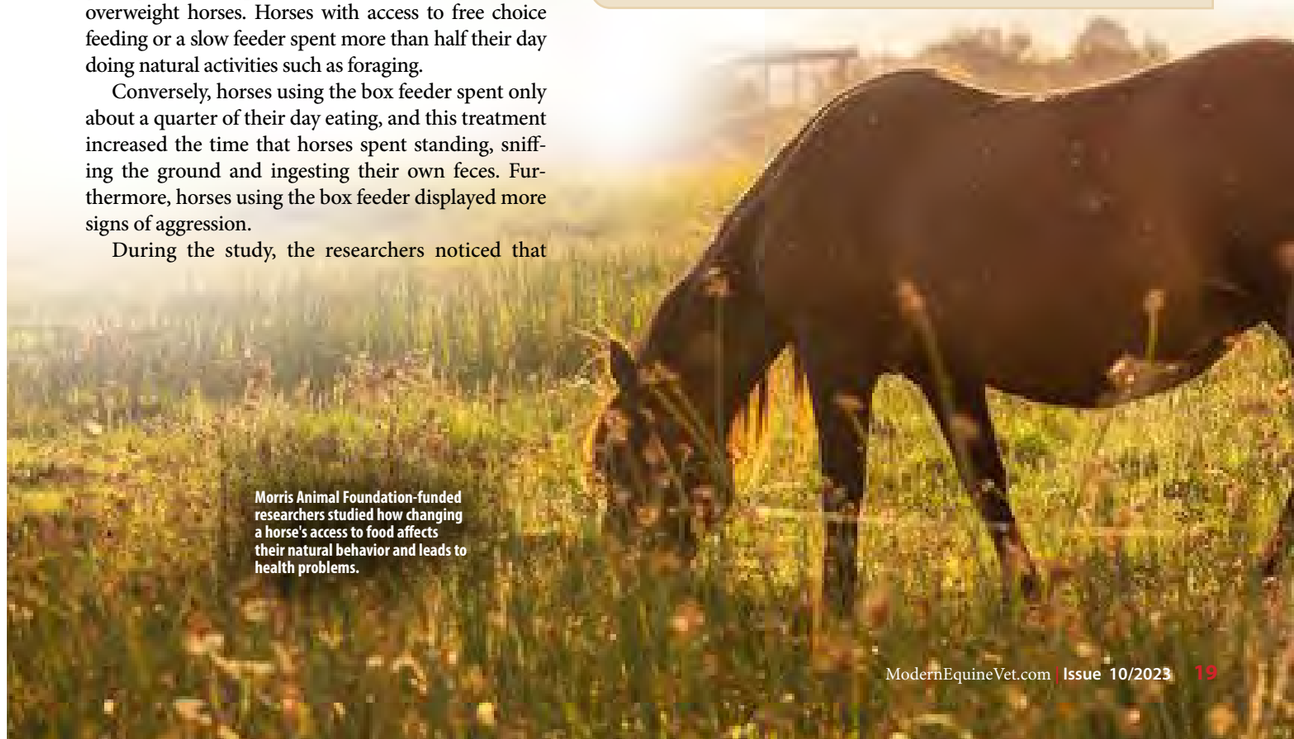
During the study, the researchers noticed that horses became more aggressive as the feeders' sizes became smaller and access to the food became more difficult. To mitigate this, researchers suggested that if horses are given a limited amount of food, it's important to ensure enough space for each of them to eat without feeling crowded.

"Taking care of horses means more than just giving them a place to stay, food and water. It means giving them an environment where they can do things that are part of their natural behavior like grazing," said **Jéssica Carvalho Seabra**, a PhD-candidate in the Department of Animal Science, Federal University of Paraná, Curitiba, Paraná, Brazil, and a researcher involved in this study.

"Selecting the right feeding technique can extend the time horses engage in natural behaviors, reducing the incidence of chronic stress and potentially curbing the emergence of abnormal and stereotypic behaviors in the long run," Ms. Carvalho Seabra said. **MeV**

For more information:

Carvalho Seabra J, Hess T, Martinez do Vale M, et al. Effects of different hay feeders, availability of roughage on abnormal behaviors and cortisol circadian rhythm in horses kept in dry lots. *J Equine Vet Sci*. 2023;130:104911.
https://www.sciencedirect.com/science/article/abs/pii/S073708062300727X



Credit: Nick Fewings

Morris Animal Foundation-funded researchers studied how changing a horse's access to food affects their natural behavior and leads to health problems.

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