



EQUINE HEALTH UPDATE

FOR HORSE OWNERS AND VETERINARIANS

The Equine Microbiome

By Micalah Mitchner, DVM Student (Class of 2025)
Edited by Dr. Camilla Jamieson, MRCVS, DACVIM

Microbes are microorganisms that can only be viewed with a microscope and include bacteria, algae, and protozoa. Whole populations of microbes within a given environment can be described as a microbiome, which can be found in or on living beings working symbiotically with them. One type of microbiome that has become a growing area of research is the gastrointestinal microbiome. In human medicine, the gut microbiome has been found to influence many types of disease, and veterinary researchers have carried those findings over into veterinary medicine. In equine medicine, great strides have recently been taken in our understanding of the equine microbiome.

Like humans, horses have a simple stomach for digestion and then ferment their ingesta further down the intestinal tract. Horses are hindgut fermenters which means their colon and cecum function as fermentation chambers to produce short chain fatty acids, and those fatty acids supply 2/3 of their daily energy requirement; billions of fibrolytic bacteria (a symbiotic bacteria) make this possible (Costa *et al.*, 2012). The microbial populations of the intestines, termed the microbiota, vary depending on age, exercise, climate, location, transportation, disease, and more. Greater than one thousand species of bacteria have been isolated from the equine GI tract (Boucher *et al.*, 2024), but the most abundant types include *Firmicutes* and *Bacteroidetes* (Costa *et al.*, 2012).

So, what can affect the microbiome? The bottom line is this: a larger diversity of microbes results in a healthier GI tract, whereas a smaller diversity of microbes results in a GI tract vulnerable to disease (**Figure 1, page 2**). A study in 2020 found that an equine diet that includes large amounts of grains leads to a lower diversity of microbes in the gastrointestinal tract (Garber *et al.*, 2020). With a smaller diversity of beneficial bacteria in the intestines comes the opportunity for harmful bacteria to take over (dysbiosis), inducing colitis (an inflammatory reaction within the colon). The same study also found that a diet consisting only of hay (which has less nutrients than a mixed concentrate and hay diet) causes slower digestion which induces a higher microbial diversity; on the other hand, a diet that is supplemented with starchy concentrates provides more nutrients that are digested more quickly which lowers microbial diversity (Garber *et al.*, 2020). The composition of a horse's diet

(continued on page 2)

WINTER 2024 / SPRING 2025

Understanding the Challenges of Winter and Preparing for Spring



CONTENTS

Medicine/Nutrition Focus

- The Equine Microbiome pg. 1
- Silage pg. 3
- Fescue Toxicity pg. 9

Ophtho

- Equine Eyes pg. 4

Surgery

- Subsolar Abscesses. pg. 5
- What's That Bump pg. 6

News & Notes

- Who's Who pg. 3
- Equine Wellness Forum pg. 10

Spotlight on Research

- Fish Oil. pg. 8



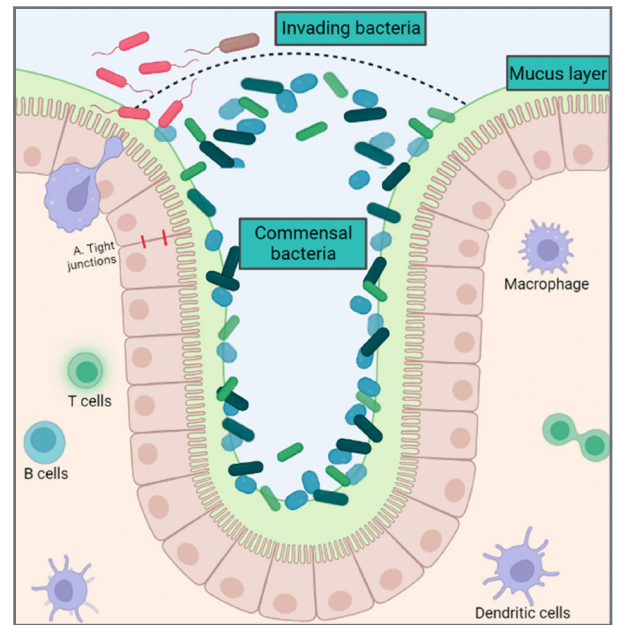
Microbiome

(continued from cover)

directly correlates to the microbiome and its major bacterial populations. With concentrate-supplemented diets high in carbohydrates, the bacterial composition of the microbiome shifts to greater amounts of lactic acid-producing bacteria (such as *Streptococci*) which results in colitis and laminitis, whereas a strictly fibrous diet shifts the composition to greater amounts of acetic-acid producing bacteria and reduces the occurrence of disease associated with lactic acidosis (Garber *et al.*, 2020).

Common practices used to manipulate the gastrointestinal microbiota include probiotics, prebiotics, and fecal transplants, each with their advantages and disadvantages (Figure 2). The goal of probiotics is to introduce a supplement containing beneficial microorganisms that will eventually end up in the hindgut of the horse where they will colonize and prevent colonization by harmful bacteria resulting in dysbiosis. The issues encountered with using probiotics are the lack of consistent benefits and the difficulty of an orally administered product surviving the acidity of the stomach and successfully reaching the distal intestinal tract (Boucher *et al.*, 2024). Prebiotics are not living organisms, but instead contain substances that boost the growth of beneficial bacteria in the intestines. Fecal transplants involve taking a fecal sample from a healthy donor and implanting it into a diseased recipient to promote the growth of healthy bacteria. In equine medicine, prebiotics and fecal transplants also have their disadvantages in that research into prebiotics has lacked sufficiently large

Figure 1. Depiction of the role of commensal bacterial in the intestinal tract (Boucher *et al.*, 2024)



A. Tight junctions acts as an intercellular barrier for the cells bordering the intestinal lumen of the colon and cecum

enough study groups to claim groundbreaking results and different published studies regarding fecal transplants have conflicting results (Boucher *et al.*, 2024).

Overall, our knowledge of the equine intestinal microbiome is quite limited compared to humans (or even ruminants), but its importance has become clear, and more research is certainly needed.

Table 2. Summary of findings and conclusion on the main techniques currently used for gut microbial manipulations in horses.

	Findings	Conclusions
Probiotic	<ul style="list-style-type: none"> There are inconsistencies in the results and conclusions of different studies. Many probiotics marketed for horses do not comply with their labels. Studies have demonstrated the potential of high doses of the yeast <i>Saccharomyces</i> to modulate the gut microbiota in horses. 	<ul style="list-style-type: none"> Well-controlled studies with larger sample sizes should be conducted to conclude the actual efficiency of probiotics in horses. <i>Saccharomyces cerevisiae</i> or <i>boulardii</i> are perhaps the most promising probiotics for adult horses.
Prebiotic	<ul style="list-style-type: none"> Prebiotics (e.g., oligosaccharides) have great potential to modify the hindgut microbiota of horses when given at high doses. Most of the studies included small sample sizes, had many variables, evaluated different products, or were performed <i>in vitro</i>. 	<ul style="list-style-type: none"> It is difficult to conclude from the available data benefits and adequate doses of prebiotics to modulate the equine gut microbiome. Well-controlled studies with larger sample sizes should be performed.
Fecal microbiota transplantation (FMT)	<ul style="list-style-type: none"> There are inconsistencies in the results and conclusions of different studies. Freezing feces before FMT likely decreases bacterial viability. 	<ul style="list-style-type: none"> Multicenter, well-controlled studies with larger sample sizes should be performed to prove the clinical efficacy of FMT. Standard protocol guidelines for FMT should be based on the results of controlled studies.

Figure 2. Summary of probiotic, prebiotic, and fecal transplant use in equine medicine (Boucher *et al.*, 2024)

References

- Boucher, L., Leduc, L., Leclère, M., and Carvalho Costa, M. (2024). *Animals*, 14(758). <https://doi.org/10.3390/ani14050758>
- Costa, M. C., Weese, J. S. (2012). *The equine intestinal microbiome. Animal Health Research Reviews*, 13(1), 121-128. [doi:10.1017/S1466252312000035](https://doi.org/10.1017/S1466252312000035)
- Garber, A., Hastie, P., Murray, J. (2020). *Factors Influencing Equine Gut Microbiota: Current Knowledge. Journal of Equine Veterinary Science*, 88. <https://doi.org/10.1016/j.jevs.2020.102943>



Promotions:

If you see our wonderful new vet nurse **Allison Gossett RVT**, give her a big congratulations! She just passed her VTNE, the veterinary nursing licensing exam, on the first attempt, which is a huge achievement! She has been promoted to Veterinary Nurse, and is thriving in her new role. She still primarily works in the Theriogenology department with Dr. Justin Hayna, but you might well see her throughout the hospital now!



New Staff: Alicia Williams, Large Animal Veterinary Assistant

I am a recent veterinary technician student, graduating with an associate degree from Vet Tech Institute at Fox College Illinois. I also have a degree in English communications and professional writing from Calumet College of St. Joseph. During my free time, I enjoy reading fantasy novels, gaming, and finding new DIY projects. I am a 4H Alumni, that was a part of the companion animal program branch for rabbits. A fun fact would be that I still have my 4H rabbit named TJ, and he will be 14 years old by the end of the year.

Silage for Horses: Things to Consider

By Shelby Owens, DVM Student (Class of 2025) — Edited by Camila Jamieson, MRCVS, DACVIM

As most horse owners are aware, the feed fed to our horses is a vital part of maintaining their health and immunity. When a horse's gut microbiome is altered, there can be systemic consequences such as laminitis, colic, metabolic disorders, and more.³ Recently, there is growing interest for the use of silage in the equine community of the United States as this product is a praised feed source for livestock. Silage is a fermented crop that is prepared and stored under anaerobic conditions. There are both risks and potential benefits for the addition of silage to a horse's feeding regiment, and these factors must be considered diligently when choosing appropriate feed for your horses.

Silage is created from the ensiled fermentation of a crop which propagates lactic acid and volatile fatty acid formation and a decrease in pH.² This process makes silage both easier to digest by horses and preferable to taste compared to other feed options.⁴ Silage is sealed in an air-tight wrap to allow anaerobic fermentation, and this process prolongs storage potential which can then allow adequate nutrition be available for equids in the harsh winter months. The dense packing of silage reduces the rate of aerobic deterioration and mold formation once opened as compared to hay bales.² Also, the organic acids produced during production also inhibit the growth of many pathological bacteria which can lead to spoilage or rot that can cause severe illness if consumed by horses.¹ These factors are especially beneficial in regions of moist and humid weather which propagate mold and bacterial growth on hay. The most notable benefit of choosing silage is its potential to lessen respiratory issues in certain horses. As compared to hay, the moist nature of silage greatly reduces the release of airborne irritants, and this is thought to reduce the occurrence of equine asthma, recurrent airway obstruction, and other respiratory diseases.²

Although there are perks to using silage, there are also many concerns to be considered as well. As hindgut fermenters, horses rely on a diverse microbiota to maintain gut health, and having greater diversity within the microbiota has been shown to positively correlate to immune health, metabolisms, and the

function of other bodily systems.³ In many cases of colic caused by diet indiscretion, there is a notable reduction in the microbiota variety and an accompanying overproduction of pathogenic bacteria.³ In 2021, there was a study examining the effects of certain diets on the fecal microbiota. These scientists found that horses fed solely silage had significantly less microbiota diversity than those fed solely pasture grasses.³ Additionally, during processing, silage can be contaminated with feces, decaying organic material (such as cadavers), and other harmful components that can serve as bacteria promoters or toxins for horses.² Botulism and listeriosis are some potentially lethal ailments caused by contaminated silage consumption.² Silage production is also an environmental risk as it creates a harmful effluent or by-product 'wastewater'.¹ This wastewater has such a high oxygen demand and nutrient content that when leaked into the environment, it can propagate extreme algae and plant growth to the point of depleting water sources of oxygen resulting in a loss of aquatic life in a process called eutrophication.¹

Overall, there are many factors that can affect one's decision to choose silage over other more traditional feeds such as hay or haylage. If you do choose to use silage, it is of great importance to find a reliable, good quality source for your horses. Not only should you ensure the silage is mold, contaminant and toxin free, but monitoring its fermentation level and moisture content are critical to ensuring its quality.⁴ It is recommended to seek veterinary guidance when deciding if silage is a good fit for your horses.

References

1. Gebrehanna, M.M., Gordon, R.J., Madani, A., VanderZaag, A.C., Wood, J.D. "Silage Effluent Management: A Review." *Journal of Environmental Management*, vol. 143. 2014. Pp. 113-122. <https://doi.org/10.1016/j.jenvman.2014.04.012>
2. Muller, Cecilia Elisabeth. "Silage and haylage for horses." *Grass and Forage Science*, vol. 73, no. 4. 2018. Pp. 815-827. DOI: 10.1111/gfs.12387
3. Zhu, Yiping., Wang, Xuefan., Deng, Liang., Chen, Shulei., Zhu, Chunyan., Li, Jing. "Effects of Pasture Grass, Silage and Hay Diet on Equine Fecal Microbiota." *Animals*, vol. 11, no. 5. May 2021. Pp. unknown. DOI: 10.3390/ani11051330
4. Kamal, Shahrir. "Can Horses Eat Silage: Unlocking the Nutritional Power." *Vet Advises*. 25 Sept., 2023. <https://vetadvises.com/can-horses-eat-silage/>. Accessed 14 Oct., 2024.

A Deeper Look into your Horses' Eyes

By M. Ximena Yanez Diaz, DVM Student (Class of 2025)
Edited by Dr. Camilla Jamieson, MRCVS, DACVIM

One of the most beautiful and complex structures of a horse are its eyes as they have many features that help keep them safe from predators. For example, the eyes of a horse are bigger than any land mammal allowing them to capture the maximum amount of light in dim conditions. Horses also have a rectangular pupil which extends their visual field.¹ Still not impressed? What if I told you that horses also have built in “sunglasses?”

If you carefully look into a horse's eye you may notice a brown “blob” that appears to be hanging from the iris into the pupil (**figure 1**). This brown “blob” is called the corpora nigra and it's a normal anatomical structure in horses that acts like polarized sunglasses, functioning to reduce the glare from bright light. The corpora nigra is composed of cells that form the iris called epithelium. This epithelium is present on the top part of the iris on most horses, but it may also be seen on the bottom. Equine radiologist and expert, Dr. Paula Williams, believes that the function of the corpora nigra to reduce glare and improve vision is yet another visual adaptation horses have as prey animals to escape predators or danger. It is important to recognize that in occasions the corpora nigra of a horse can become too enlarged and end up interfering with the horses' vision rather than helping. Some causes of an enlarged corpora nigra include inflammatory conditions, tumors or iris cysts.²

Iris cysts are the most common cause for the corpora nigra of a horse to become abnormal (**figure 2**). The iris cysts form when the lining of the corpora nigra secrete a viscous material causing them to swell and grow. This material accumulates leading to the enlargement of the corpora nigra and the formation of a smooth and round cyst. One may find a single cyst or multiple on one or both eyes. Even though the iris cysts are not painful, they can be large enough to extend over the pupil and block the visual field of the horse. These large cysts can

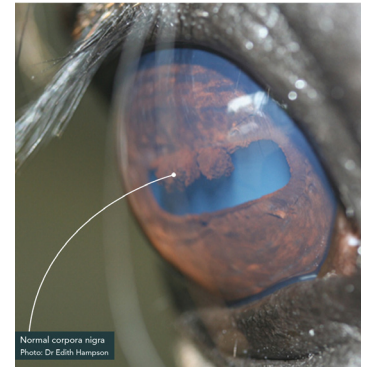


Figure 1. Normal corpora nigra in the upper aspect of the iris.²



Figure 2. Large iris cyst covering most of the pupil and most likely blocking the vision of this horse.⁴

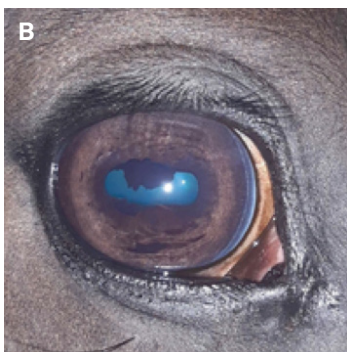
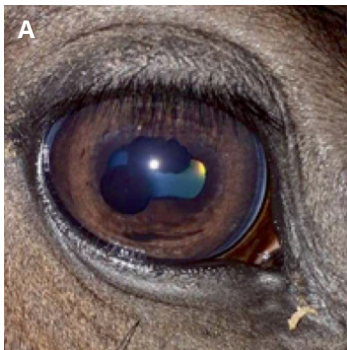


Figure 3. Iris cyst before and after diode laser therapy. (A) Eye before laser therapy. The iris cyst is present on the lower margin of the iris and normal corpora nigra is on the upper margin of the iris. (B) Same eye as 3A after laser therapy.⁴

then lead to clinical signs such as headshaking and changes in behavior such as spooking, decreased performance, or mistiming a jump. The iris cysts can also be small enough that they do not block the visual field of the horse or cause any clinical signs.³

Treatment of iris cysts is recommended for those horses that have significant decreased vision and changes in behavior. The current most effective, safe, and non-invasive method to treat problematic iris cysts is by diode laser therapy. This procedure is performed under standing sedation with local anesthesia and the goal is to disrupt fluid secretion of the cyst by “popping” it or deflating it with the laser. A recent retrospective study by the University of Utrecht Equine Clinic documented the great success of this procedure in 46 eyes of 35 horses. They found that the clinical signs had improved or disappeared after 1.5 years in more than 90% of the cases and that 2 eyes had recurrence. In addition, minor complications such as laser damage to the retina or corneal fibrosis were reported in only 8 out of the 46 eyes treated (17%).⁴

In summary, the corpora nigra is a unique structure found in the eyes of many healthy horses that act like sunglasses by helping them block the glare from bright light. If you or a friend worry that the corpora nigra of your horse is enlarged and developing into an iris cyst, talk to your primary veterinarian. They will carefully evaluate your horse's eye by using an ophthalmoscope and ultrasonography to confirm a fluid-filled cyst and to rule out inflammation or a tumor. If treatment is pursued, schedule the diode laser therapy with a veterinary ophthalmologist to provide the best outcome for your horse and to reduce the chance of any complications.

References

1. “Vision in the Equine.” *Equine Science*, Iowa State University, www.extension.iastate.edu/equine/vision-equine#:~:text=The%20equine%20eye%20is%20eight,the%20side%20of%20the%20head. Accessed 8 June 2024.
2. Williams, Paula. “Let Us Have a Look ...at Corpora Nigra.” *WestVETS*, WestVETS Animal Hospital, www.westvets.com.au/wp-content/uploads/2021/07/corpora-nigra.pdf. Accessed 9 June 2024.
3. Sandmeyer, Lynne S, et al. “Diagnostic Ophthalmology.” *The Canadian Veterinary Journal*, *La Revue Veterinaire Canadienne*, U.S. National Library of Medicine, July 2013, [www.ncbi.nlm.nih.gov/pmc/articles/PMC3685009/#:~:text=They%20are%20an%20extension%20of,in%20bright%20light%20\(1\)](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3685009/#:~:text=They%20are%20an%20extension%20of,in%20bright%20light%20(1)).
4. K. L. Stas, Emanuël, et al. “Noninvasive Diode Laser—an Effective and Safe Treatment of Iris Cysts in 46 eyes of 35 Horses.” *British Equine Veterinary Association*, May 2022, [beva.onlinelibrary.wiley.com/doi/full/10.1111/evj.13590](https://doi.org/10.1111/evj.13590).

SUBSOLAR ABSCESSSES

Cause Subpar Performances

By Caitlyn Gunther, DVM Student (Class of 2025) — Edited by Dr. Camilla Jamieson, MRCVS, DACVIM

Subsolar abscesses are one of the most common causes of acute, severe lameness in horses. A subsolar abscess forms when bacteria or foreign material enters through a defect in the hoof wall inducing an inflammatory response and causing a localized infection within the foot. These are unfortunately particularly common in the winter in Indiana due to the abundance of mud. They occur in horses of all ages and disciplines, but fortunately with prompt diagnosis and treatment by a veterinarian, most horses will recover smoothly and will return to their original performance. Below are some questions and answers regarding the diagnosis, treatment, and prevention of subsolar abscesses to help keep your horse as happy and healthy as possible.

Q: How did my horse get a subsolar abscess?

A: Many factors can lead to the development of an abscess including poor hoof quality, improper shoeing, excessively wet ground conditions, or substrates that are harsh on a horse's feet. Penetrating wounds can also lead to an abscess even though the puncture may not be visible.

Q: How do I know my horse may have a subsolar abscess?

A: Severe, acute lameness is often the first sign of a subsolar abscess that owners notice. The affected limb may be swollen up to the fetlock or be warm to the touch. Digital pulses may be more prominent on the affected limb, and although uncommon, horses may have a fever. It is important for a veterinarian to examine the horse to differentiate an abscess from laminitis, severe solar bruise, or a distal phalanx fracture which have similar presentations. Horses usually are painful with hoof testers in a focal spot. The vet may pare out the sole in this spot to find the abscess and establish a draining tract.

Q: What is involved in the treatment of a subsolar abscess? How long will my horse have to be treated?

A: Establishing drainage is the key to treating a subsolar abscess. A vet typically does this with a paring knife. A bandage will be applied to the foot to keep it protected and prevent debris from packing into the hole which delays healing. Bandages will need changed every couple days and your vet may recommend soaking the hoof with Epsom salts in between bandage changes as well. The horse will



Examples of subsolar abscesses indicated by red arrows and a red circle. Image courtesy of American Farriers Journal (2018).

need to be kept in a clean, dry area to protect the hoof until it is healed, which may mean stall rest for the horse. A tetanus booster may be recommended if a puncture wound is suspected to have caused the abscess.

Q: What is my horse's prognosis? How can I prevent them from getting another abscess?

A: Horses with uncomplicated abscesses should show improvement 24 hours after starting treatment and recover fully in one to two weeks. Abscesses draining from the coronary band, affecting multiple parts of the hoof, presenting in the summer, or those with bony involvement tend to have longer treatment times whereas those with draining tracts already established at the time of diagnosis or presenting in the winter have shorter treatment times. Keeping horses out of super wet or rocky conditions as well as proper hoof care can help prevent abscesses. Chronic subsolar abscesses can be due to systemic health issues such as laminitis or equine Cushing's, so contact your vet if abscesses are not healing or recurring for further workup.

Q: How do I apply a hoof bandage?

A: Hoof bandages are essential for healing abscesses as they keep the foot clean, dry, and prevent debris from entering the abscess tract. The horse must stay out of muddy and wet areas while the bandage is in place. Below are a series of images that show each layer of a typical hoof bandage being applied, but consult with your vet for specific bandaging recommendations for your horse.

CONTINUED ON PAGE 6

References

1. Cole, S. D., Stefanovski, D., Towl, S., & Boyle, A. G. (2019). Factors associated with prolonged treatment days, increased veterinary visits and complications in horses with subsolar abscesses. *Veterinary Record*, 184(8), 251–251. <https://doi.org/10.1136/vr.104138>
2. Floyd, A., & Mansmann, R. (2007). *Equine Podiatry - E-Book*. In Google Books. Elsevier Health Sciences. https://books.google.com/books?hl=en&lr=&id=if_7u1fBF1EC&oi=fnd&pg=PA281&dq=subsolar+abscess+horse&ots=gbQNZhRMJC&sig=ZoQosAULYqM4gFRJIWU5vxHSTCY#v=onepage&q=subsolar%20abscess%20horse&f=false
3. Redding, W. R., & O'Grady, S. E. (2012). Septic Diseases Associated with the Hoof Complex. *Veterinary Clinics of North America: Equine Practice*, 28(2), 423–440. <https://doi.org/10.1016/j.cveq.2012.06.004>

WHAT'S THAT BUMP?!

Sarcoids and Your Horse

By: Dr. Glenys Biblow, DVM — Edited by Dr. Camilla Jamieson, MRCVS, DACVIM

Whether this is your first week with your horse, or you've had them in your family for generations, you've probably heard of the dreaded s-word: sarcoid.

Sarcoids are the most common skin tumor of the horse, they can range from being a small hairless area to destroying local tissue structures. The biggest problem with sarcoids is that diagnosing and treating them can be difficult for a number of factors. There is evidence that links these tumors to Bovine Papilloma Virus types 1 and 2 (BPV-1/-2); however, how the virus is transmitted to horses hasn't been confirmed. There are thoughts that BPV-1/-2 can transmit between direct contact with infected cows or horses, or between flies that have bitten infected cows or horses and healthy animals. Regardless of how your horse obtained the sarcoids, now what do you do as an owner? The answer to this question starts with finding out the type of sarcoid that your horse has.

Sarcoids can be split into 6 different categories: occult, verrucose/warty, nodular, fibroelastic, mixed, and



Figure 1. An occult sarcoid by the eye of a horse

malignant/malevolent. Occult sarcoids (**Figure 1**) are characterized by being a flat, hairless area of skin that might have some scaling present. Verrucose sarcoids (**Figure 2**) have a wart-like appearance and can be raised, scaly, and thickened or leathery. Nodular sarcoids (**Figure 3**) are firm nodules that are under the outer surface of the skin and are further divided into whether they involve the inner surface of the skin or not. Fibroelastic sarcoids (**Figure 4**) have an

CONTINUED ON PAGE 7

Subsolar Abscesses *(continued from page 5)*



Step 1: Place a poultice pad over the abscess site, then secure it in place with a baby diaper with the toe in the crotch of the diaper.



Step 2: Wrap the hoof with VetWrap leaving about one inch of diaper exposed at the top of the bandage. To ensure the bandage is not too tight, one finger should fit between the horse's skin and the diaper.



Step 3: Wrap elastikon around the horse's leg so it covers the skin, diaper, and top of the VetWrap a couple times. This helps prevent any debris from entering through the top of the bandage. Stretch the elastikon before wrapping it around the leg to ensure it is not too tight.



Step 4: Construct a duct tape boot as shown below to cover the bottom of the bandage. Cut along the diagonal red lines to help fit the tape to the hoof better. A slipper can also be used over the hoof in place of the duct tape boot. Image courtesy of Large Animal Internal Medicine (2019) by B. Smith, D. Van Metre, and N. Pusterla)

Images courtesy of: Large Animal Internal Medicine (2019) by B. Smith, D. Van Metre, and N. Pusterla; iStock; Mid-Rivers Equine Centre; Mid-Rivers Equine Centre; and Large Animal Internal Medicine (2019) by B. Smith, D. Van Metre, and N. Pusterla.

Sarcoids *(continued from page 6)*

ulcerated appearance and can be fleshy protrusions from the skin and tend to infiltrate into surrounding tissues. Mixed sarcoids (**Figure 5**) are classified when there is a combination of any of the above types on the same area. Malignant sarcoids (**Figure 6**) are the most welfare-concerning type of sarcoid. Malignant sarcoids grow very rapidly and spread both on top and underneath the skin's surface.

If the type of sarcoid isn't outright obvious to you, there are a few options that your vet can use to diagnose but those run risks; for reasons that aren't fully known, doing a biopsy/irritating the sarcoid runs the risk of aggravate the tissues and causing it to change from a benign process to a very aggressive type. Due to this, many veterinarians choose to empirically treat and proceed to further diagnostics if required. However, there is research suggesting there are less invasive methods than a biopsy that have shown success in diagnosing equine sarcoids. Such methods include fine needle aspiration (FNA) followed by PCR-based testing for BPV-1/-2 DNA. As the area is still being irritated with a needle, the likelihood of an aggressive response outcome remains uncertain.

This still leaves the question: you think your horse has a sarcoid, so what do you do? It is important that if you think your horse has a sarcoid, not to irritate the area further with home-remedies or picking any scabs, as this can cause it to become more aggressive. Therefore, the first step if you think a sarcoid is present is contacting your veterinarian and making a note of it. This is important so you and your veterinarian can monitor for progression, regression, or change of the lesion(s). As well, location and number of sarcoids can change what type of treatment your veterinarian would like to do. The next step can vary from benign neglect (the veterinary term for not treating medically/surgically but keeping an eye on it and monitoring for changes) which is often used for occult, verrucose, and some nodular sarcoids since these have the highest chance of going away on their own. From benign neglect, the treatment options increase in terms of invasiveness and include topical therapies (which is the usual first-line treatment) to systemic treatments, local chemotherapy or tissue treatments, or surgical removal. Often these therapies are combined (for example – surgical debulking of the sarcoid followed by cryotherapy (freezing) of the tissues that are left), or topical application to try shrink the lesion followed by surgical removal. Talking with your veterinarian about your horse and the type and presentation of the sarcoid(s) will help tailor the best diagnostic and treatment plans.

Future advancements in diagnostic technology will hopefully allow veterinarians to be able to consistently diagnose equine sarcoids while removing the risk of aggressive response to irritation. For now, as an owner don't pick that bump and give your veterinarian a call!



Figure 2.
A verrucose sarcoid around the eye of a horse



Figure 3.
A nodular sarcoid on the inner thigh of a horse



Figure 4.
A fibroelastic sarcoid around the eye of a horse



Figure 5.
A mixed (verrucose and nodular) sarcoid on the neck of a horse



Figure 6.
A malignant sarcoid on the back leg of a horse

References

1. Gysens, L., Martens, A., & Haspeslagh, M. (2022, November). Cross-sectional comparison of superficial swab and fine-needle aspiration: Improving the diagnostic workup of horses with sarcoids. *The Veterinary Journal*, 289, 105916.
2. Haspeslagh, M., Gerber, V., Knottenbelt, D., Schüpbach, G., Martens, A., & Koch, C. (2018). The clinical diagnosis of equine sarcoids—Part 2: Assessment of case features typical of equine sarcoids and validation of a diagnostic protocol to guide equine clinicians in the diagnosis of equine sarcoids. *The Veterinary Journal*, 14-18.
3. Hollis, A. R. (2023). Management of equine sarcoids. *The Veterinary Journal*, 291, 105926.
4. Ogińska, M., Starzyński, R. R., Pierzchała, M., Otrocka-Domagala, I., & Raś, A. (2021). Equine Sarcoids - Causes, Molecular Changes, and Clinicopathologic Features: A Review. *Veterinary Pathology*, 58(3), 437-588.
5. Taylor, S., & Halderson, G. (2013). A review of equine sarcoid. *Equine Veterinary Education*, 210-216.



Spotlight on Research

Fish Oil May Improve Lung Health in Racehorses, Even Without Reducing Dust Exposure

By Laurent Couetil, DVM, PhD, DACVIM

Racehorses are elite athletes, but just like human athletes, their performance can be affected by environmental factors. One of the most common issues affecting horses, particularly those housed in stables, is airway inflammation caused by hay dust. This can lead to respiratory conditions like asthma, which can impair a horse's ability to race at its best.

A recent study has found a potential solution to this problem: fish oil supplements rich in omega-3 fatty acids. The research, conducted with healthy racehorses at several racetracks in the U.S., showed that adding fish oil to a horse's diet could reduce lung inflammation—even in dusty environments.

The Problem: Dust and Respiratory Issues in Horses

When horses breathe in small dust particles, especially from hay or bedding, it can trigger inflammation in their lungs, which may cause coughing, labored breathing, and other symptoms like asthma in people. Inflammation in the airways is typically characterized by an increase in certain immune cells, like neutrophils, which are a type of white blood cell involved in inflammation.

If this condition is not managed, it can have a significant impact on a horse's health and performance. Training and racing with impaired lung function can hinder a horse's ability to compete at its highest level.

The Research: Fish Oil to the Rescue

In this study, Dr. Couetil and collaborators wanted to determine if omega-3 fatty acids, which are known for their anti-inflammatory properties, could help reduce the number of neutrophils (inflammatory cells) in the lungs of racehorses in training. Omega-3s are found in fish oils and may help lower inflammation in humans and other animals. The investigators tested whether giving racehorses a daily fish oil supplement would lower the proportion of these inflammatory cells in the lungs, even without reducing dust exposure. Dr. Couetil presented the results from this study at the American College of Veterinary Internal Medicine Conference in Minneapolis, June 2024.

How the Study was conducted

The study involved 83 healthy thoroughbred racehorses housed at four different racetracks located in California, Florida, Indiana and New Mexico. For four weeks, the horses were randomly assigned to receive either a fish oil supplement or a placebo (corn oil, which doesn't contain omega-3s). At the beginning and end of the trial, the researchers measured the horses' lung health by collecting lung wash fluid to assess the number of neutrophils present. They also measured dust exposure and the amount of omega-3s in the horses' blood to track how well they were absorbing the supplements.

What Did the Study Find?

The results were promising. Horses that received the fish oil supplement showed a significant reduction in neutrophils in their lung fluid after four weeks. Specifically, the proportion of

neutrophils in their lungs dropped by 56%, a clear sign that the fish oil was reducing inflammation in their airways. On the other hand, the horses who received the placebo showed no change in their lung health.

Even more interesting, the researchers found that the reduction in lung inflammation was linked to an increase in plasma levels of docosahexaenoic acid (DHA), a type of omega-3 found in fish oil. In contrast, when levels of arachidonic acid (a fatty acid that promotes inflammation) increased, the number of neutrophils in the lungs also increased.

Why Does Fish Oil Work?

The key to understanding why fish oil helps lies in its high levels of omega-3 fatty acids, particularly DHA. Omega-3s are known to help reduce inflammation in the body by modulating the immune response. When horses are exposed to irritants like dust, their immune system responds by increasing inflammation in the lungs. Omega-3s help to "calm down" this response, reducing the number of neutrophils and other inflammatory cells in the airways, which in turn helps improve lung function.

Interestingly, the study showed that the omega-3 supplement worked even without reducing dust exposure. This is important because it suggests that omega-3 supplementation could be a helpful strategy for horses that are unable to avoid dusty environments, such as those fed hay in stables.

What Does This Mean for Horse Owners and Trainers?

For horse owners and trainers, this study presents a simple and potentially effective way to help manage respiratory health in racehorses. By adding a fish oil supplement to a horse's diet, it may be possible to reduce airway inflammation and support better lung function—critical for an athlete that depends on strong respiratory health.

This could be especially beneficial for horses in training where dust is unavoidable, as the omega-3s appear to work independently of dust exposure. By including fish oil or omega-3-rich supplements in their diets, racehorses might experience improved respiratory health, potentially leading to better performance and reduced risk of respiratory problems down the line.

Conclusion

This study provides strong evidence that omega-3 fatty acids, particularly those found in fish oil, can reduce lung inflammation in healthy racehorses, even when they are exposed to dust. As omega-3s help lower the proportion of neutrophils in the lungs, this supplement could be a valuable tool for managing respiratory issues like asthma in horses, promoting better health and performance.

For horse owners and trainers, this means that a simple dietary supplement could make a big difference in keeping horses healthy, breathing easily, and ready to race.



Tall Fescue Grass Toxicosis

By Devon Anderson, DVM (Class of 2025) — Edited by Dr. Camilla Jamieson, MRCVS, DACVIM

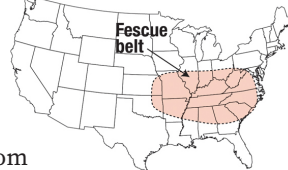
Introduction

Tall fescue grass is a hardy perennial cool season grass utilized as forage. Unfortunately, it's estimated that $\geq 90\%$ of tall fescue grass is infected with toxic fungal organisms called endophytes. The endophyte forms a symbiotic relationship with tall fescue grass living within the leaves, stems, and seeds, meaning that the presence of the fungus helps the host fescue, and the host fescue supports the fungus.



Endophyte infected fescue within the seed head, stem, and leaf.

The plant provides a stable protective environment and supplies nutrients critical for endophyte survival. In return, the endophyte provides the plant with better resistance and vigor to pests, droughts, and grazing. This increases the growing season of the plant and allows tall fescue grass to flourish on pastures.



Distribution

The distribution of tall fescue ranges from the Southeast to Midwest. This range is called the fescue belt and comprises the following states: Alabama, Arkansas, Carolina, Georgia, Illinois, **Indiana**, Kansas, Maryland, Mississippi, Missouri, North Ohio, Oklahoma, Pennsylvania, South Tennessee, Virginia, and West Virginia.

Equine Reproductive Effects

The endophyte primarily produces toxic ergot alkaloids with the most prominent alkaloid produced being Ergovaline. Horses have a low tolerance to ergot alkaloids which cause prolonged gestation, dystocia, thickened placentas, agalactia, and increased foal mortality.

Agalactia is a condition characterized by decreased mammary gland development and milk production. This condition occurs when prolactin, a hormone needed for normal lactation initiation and mammary gland development, isn't secreted properly. In normal physiology, dopamine inhibits prolactin secretion at the level of the anterior pituitary gland. Ergovaline is a potent dopamine agonist which mimics the actions of dopamine. When high levels of Ergovaline circulate in the mare, it inhibits prolactin secretion from the pituitary gland. Therefore, prolactin levels are very low causing agalactia. Hypoprolactinemia (low prolactin), is a hallmark characteristic of equine fescue toxicosis.



Tall fescue infected with endophytes.



Normal Fescue growing in a pasture.

The mare's placenta is also affected by toxic ergot alkaloids. It causes suboptimal placental function and increased placental thickness which can be measured by a veterinarian via transrectal ultrasound. Despite placental insufficiency, foals continue to grow extending the mare's typical gestation time (≥ 360 days). Prolonged gestation increases the risk of dystocia and premature placental separation. This consequently can cause abortion, red bag delivery, and increases the mare's risk of a retained placenta and getting a uterine infection.

Foals born are often described as overmature with long limbs and haircoats, poor muscle mass, a weak suckle reflex, poor coordination, premature erupted incisors, increased birth weight, and increased growth of hooves (eponychium). These factors increase the chance of neonatal mortality due to the high incidences of dystocia and failure to thrive.

Prevention & Treatments

Identifying endophyte infected pastures and their concentrations of ergot alkaloids is key to preventing toxicity. To test your tall fescue grass for endophytes please contact your county's local Purdue Extension office.

If your pasture contains endophyte infected fescue all mares should be kept off the pasture for 30-60 days prior to parturition. Your veterinarian may also recommend the drug Domperidone®, a D2-dopamine receptor antagonist. This drug competes with the toxic alkaloids at the level of the dopamine receptor. It prevents Ergovaline, and other toxic alkaloids, from binding to the receptor and allows normal physiologic secretion of prolactin.

It is imperative to give neonates colostrum after being born, as these foals are prone to having a weak suckle leading to failure of passive transfer.

Take Home Points

- Agalactia and prolonged equine gestation ≥ 360 days is a common clinical manifestation
- Prevent agalactia and prolonged gestation by eliminating endophyte infected fescue in the mare's diet 30 to 60 days prior to parturition and/or giving Domperidone®
- Dystocia due to excess fetal size/ hyper maturity of foal and Red Bag delivery due to premature separation of chorioallantois preceding the foal
- Foals affected are born with a weak suckle reflex and poor coordination often resulting in failure of passive transfer. This can consequently lead to neonatal septicemia and death
- Early veterinary intervention can aid in supporting affected foals and mares in late gestation
- Pasture analysis can aid in identification of endophyte infected fescue and pasture management changes

References

1. Evans TJ, Romano MC. Toxicogenic Endophyte-Infected Tall Fescue and Ergot Alkaloids. *Vet Clin North Am Equine Pract.* 2024 Apr;40(1):95-111. doi: 10.1016/j.cveq.2024.01.001. Epub 2024 Jan 27. PMID: 38281896.
2. Lea KM, Smith SR. Using On-Farm Monitoring of Ergovaline and Tall Fescue Composition for Horse Pasture Management. *Toxins (Basel).* 2021 Sep 25;13(10):683. doi: 10.3390/toxins13100683. PMID: 34678976; PMCID: PMC8537976.
3. Roberts, C. (2000, April 1). University of Missouri. Tall Fescue Toxicosis | MU Extension <https://extension.missouri.edu/publications/g4669>



EQUINE WELLNESS FORUM

COLLEGE OF VETERINARY MEDICINE

Join us for the annual Equine Wellness Forum, on Saturday, February 8, 2025. This event is designed to educate and inform horse owners and equine industry professionals about horse health topics, ranging from basic preventative care to the latest medical advancements.

The all-day seminar is scheduled from 8:30 a.m. to 4:30 p.m. and will begin with a welcome and introductory remarks by the head of the Department of Veterinary Clinical Sciences, Dr. Catherine Scott-Moncrieff. She will be followed by a series of special speakers addressing a range of topics.

<http://vet.purdue.edu/ce/equine-wellness/index.php>

The Equine Sports Medicine Center

Purdue's Equine Sports Medicine Center is dedicated to the education and support of Indiana horsemen and veterinarians through the study of the equine athlete. The Center offers comprehensive evaluations designed to diagnose and treat the causes of poor performance, to provide performance and fitness assessments, and to improve the rehabilitation of athletic horses. Other integral goals of the Center are to pioneer leading-edge research in the area of equine sports medicine, to provide the highest level of training to future equine veterinarians, and to offer quality continuing education to Indiana veterinarians and horsemen. For more information visit our website:

<https://vet.purdue.edu/esmc/index.php>



PURDUE
UNIVERSITY®

College of Veterinary Medicine

DONALD J. MCCROSKY
EQUINE SPORTS MEDICINE CENTER
1248 Lynn Hall
West Lafayette, Indiana 47907-1248
Phone: 765-494-8548
Fax: 765-496-2641
<https://vet.purdue.edu/esmc/index.php>

EQUINE HEALTH UPDATE



Published by the College of Veterinary Medicine Equine Sports Medicine Center. With generous support of Purdue University's Veterinary Teaching Hospital and the College of Veterinary Medicine Dean's Office.

Please address all correspondence related to this newsletter to the address above.

EDITORIAL BOARD:

Drs. Couétil L., Hawkins J. and Jamieson C.

DESIGN & LAYOUT BY:

Elaine Scott Design

EA/EOU