



# EQUINE HEALTH UPDATE

For Horse Owners and Veterinarians  
Vol. 18, Issue No. 1 – 2016

## Don't Sweat It: Equine Anhidrosis

By Katie Smith, DVM Student (Class of 2016)

Edited by Dr. Teresa Buchheit, DVM, MS, Dipl. ACVIM,  
Purdue Equine Community Practice

Anhidrosis is the term used to describe a condition that results in the inability to sweat effectively in response to heat or exercise. It is most commonly noticed during periods of hot, humid weather or in horses that were recently moved to a hotter environment. Heart rate, respiratory rate and body temperature are used to measure a horse's physical fitness and ability to recover from exercise. Horses with appropriately functioning sweating mechanisms are able to return to a baseline temperature within 30 minutes of the completion of exercise.

Sweating allows cooling to occur via evaporation and humid environments often don't allow for the appropriate amount of air exchange to occur in order to efficiently cool a horse. By design, the horse is considered to be at somewhat of a disadvantage when it comes to cooling down. Body temperature is maintained by two mechanisms—sweating and secretions from the respiratory tract. The ability to sweat is responsible for the majority of the cooling process with respiratory secretions accounting for approximately 15% of cooling. If we think of the skin as the major area for heat to dissipate, the whole body (organs, muscle, etc.) of the horse must be cooled down by the surface area of the skin. Horses have a very large body volume in comparison to the area of their skin, meaning that a lot of heat needs to leave the body from a very small area. In addition to patchy and inadequate sweating, affected horses can exhibit any number of clinical signs including exercise intolerance, increased respiratory rate during or after exercise, enlarged blood vessels in the skin and hyperthermia after exercise. Horses that are chronically affected can have a thinner, dry hair coat especially over the face, neck, shoulders, and cannon bones.

*(continued on pg. 5)*



## Contents...

### Health

Phenylbutazone . . . . .pg. 7  
Monensin Toxicosis . . .pg. 6

### Community Practice

Ascarids . . . . .pg. 4  
Anhidrosis . . . . .pg. 1

### News & Notes

Shelbyville Clinic  
Update . . . . .pg. 2

### In Depth

Anhidrosis . . . . .pg. 1

Visit [vet.purdue.edu/ePubs](http://vet.purdue.edu/ePubs)  
for more information on how  
to access the newsletter through  
our PVM ePubs app.

## News & Notes

### Centaur Equine Specialty Hospital Takes Shape as Construction Proceeds and Specialist is Hired

Construction is underway with exterior walls now giving shape to the new Centaur Equine Specialty Hospital near Indiana Grand Racing and Casino in Shelbyville, Ind., as the Purdue University College of Veterinary Medicine hires a life-long equine enthusiast and board certified equine surgeon to lead the veterinary medical team that will treat equine patients. Dr. Timm Gudehus will start officially in October as clinical assistant professor of equine surgery. The facility is scheduled to be completed by the end of the year.

As a satellite facility of the College of Veterinary Medicine, the new hospital will provide specialty medical and surgical services for horse owners while also supporting equine research and education of future equine specialists. Its location is just a few miles from the track at Indiana Grand Racing & Casino, and within an hour's drive from Hoosier Park in Anderson, Ind.

Dr. Gudehus comes to Indiana from Germany where he has served as an equine surgery specialist since 2012. His love of horses and equestrian sports dates back to his early childhood, growing up in a family with a long history of horse riding and breeding. His interest in riding

show jumpers turned semi-professional as he finished high school and went on to veterinary school in Munich. After earning the German equivalent of the DVM degree, and completing an internship in Munich, he came to the U.S. for an internship in equine orthopedics in California, followed by a residency in equine surgery at the Louisiana State University School of Veterinary Medicine.

"This additional training in the U.S. exposed me to all the equine disciplines that I hadn't seen until that point, especially Thoroughbreds, racing Quarter Horses and a little bit of Western performance," said Dr. Gudehus. "That was followed by a two-year stint as a staff surgeon in Auckland, New Zealand, which added the very last discipline that I hadn't worked on, which was Standardbreds."

Dr. Gudehus returned to Germany with his wife, an American citizen and small animal veterinarian, to become the leading surgeon of one of the largest and fastest growing hospitals in Europe, where he worked on Olympic level warmblooded horses. "That adds up to 13 years as a veterinarian, almost ten in my surgical training, and six years as a boarded surgeon, on three continents and back, in every discipline," he said. —————→

*The walls for the Centaur Equine Specialty Hospital are going up in Shelbyville as construction progresses.*







*Architect's rendering of the Centaur Equine Specialty Hospital.*



*Dr. Timm Gudehus visited  
Purdue in July.*

Now he looks forward to returning to the U.S. to take-on the challenge of opening the new Centaur Equine Specialty Hospital. "I am excited about the fact that pretty much all these equine disciplines are gathered around the new facility in Shelbyville. I really hope that people will look at this and say 'cool, here's somebody who otherwise we would have to fly in,' to do exactly what I will be providing at this facility," Dr. Gudehus explained. "I also am really excited to work on racehorses again...my heart beats with the speed horses."

Dean of the College of Veterinary Medicine Willie Reed said Dr. Gudehus' experience and expertise, and the state-of-the-art facility, will be great resources for the Indiana equine industry. "I couldn't be more pleased with the way in which the dream of a world-class equine specialty hospital in proximity to our state's two racetracks is becoming a reality," Dean Reed said.

In addition to recruiting Dr. Gudehus, the College of Veterinary Medicine also has hired two equine veterinary technologists who are training in the Purdue Large Animal Hospital in West Lafayette, before moving to the facility in Shelbyville when it opens. The Centaur Equine Specialty Hospital will offer advanced diagnostic imaging, shockwave therapy, nuclear medicine, regenerative medicine, endoscopic laser surgery and specialized equine orthopedic and soft tissue surgery.

Site preparation for the facility began last fall, at the time of the official groundbreaking for the hospital. Actual construction started this spring. The \$8.8 million, 18,000 square foot structure is being built on land purchased by the Purdue Research Foundation with \$2.3 million in support from Shelby County and the City of Shelbyville. Centaur Gaming, which owns and operates Indiana Grand Racing & Casino and Hoosier Park, pledged \$3.1 million to name the facility.

# Ask your Vet about Ascarids!

By Stacy H. Tinkler, DVM, MPH, Dipl. ACVIM, Purdue Large Animal Internal Medicine

Parasite control in foals, weanlings and yearlings is different than for the adult horse, and targeted-selective deworming strategies (fecal testing and treatment only of the higher parasite egg shedders) do not apply to young horses. Foals need to be treated more frequently during the first year of life. This is because younger animals are more susceptible to parasitic disease due to an immature and developing immune system and therefore have a need for better protection during this time. A delicate balance needs to be reached between some worm exposure in the gut (necessary for development of the horse's natural immunity) and prevention of severe parasite infestation leading to illness, poor growth, and possibly death.

## What are ascarids?

Ascarids or round worms, are the main parasitic pathogen affecting foals and weanlings, and the most important foal parasite causing poor growth and ill-thrift. Symptoms of ascarid infection in horses include lethargy, inappetence, decreased weight gain, low blood protein, cough and nasal discharge. Most horses become immune to this parasite in the first year of life, and ascarid infection is rarely seen in horses over 2 years of age with well-developed immunity, although this may change in the face of increased parasite resistance to dewormers.

Since 2002, ascarid resistance has been observed in young horses in many countries and has developed in response to an inappropriate and overabundant use of certain dewormers, particularly with ivermectin and moxidectin. Historically, dewormers have been heavily used on breeding farms where many foals receive ivermectin at less than 1 month of age for suspected *Strongyloides* infection, and they are then often dewormed monthly over the first year, which is far more than is necessary and can actually prevent them from developing a natural immunity to ascarids!

## When should I first deworm my foal and with what?

According to recommendations from the American Association of Equine Practitioners (AAEP), during their first year, foals should be dewormed approximately 4 times, and the timing of and type of dewormers used at first deworming are considered of high importance. They recommend first deworming no sooner than **2-3 months of age with a benzimidazole drug** (i.e. Panacur, Safeguard, Anthelcide) to ensure efficacy. **It is best not to use ivermectin or moxidectin in young foals** as there is a significant level of ascarid resistance to these dewormers, they are less effective and at times even dangerous to foals. This is because different classes of dewormers kill parasites differently. Ivermectin and moxidectin, along with pyrantel, (Strongid) kill parasites by paralyzing the adult worms and if a large number are present in the gut of a foal or weanling when the dewormer is given the paralyzed worms can plug up the small intestine causing an impaction, colic and even possible gut rupture.



Most cases of ascarid impactions in foals (70-80%) have been associated with recent deworming with these drugs, and the majority of cases occur in foals 5-8 months of age, coinciding with weaning. Benzimidazoles are not typically associated with ascarid impaction because the worm "kill" mechanism is that it starves the worms and is therefore slower. If you find that you have an older foal that has not yet been dewormed, or looks "wormy" to you (rough hair coat, poor weight gain, abdominal distention) talk to your veterinarian about what to do **BEFORE** you deworm it. A recent ultrasound scoring system has also been assessed for trans-abdominal monitoring of ascarid worm numbers in foals that may help identify at-risk foals prior to deworming.

## How do you treat an ascarid impaction?

It is better to prevent ascarid impactions as they often require surgery, but in some rare cases they resolve with medical management (fluids, pain medication, anti-inflammatories, oral administration of mineral oil) to try and help the foal pass the impaction. The prognosis for ascarid impactions depends on the treatment method and how much gut inflammation and dysfunction the worms have caused. Some surgical success rates have been reported between 50-80%; however, post-surgical long-term survival ranges from 9-60% indicating the seriousness of an ascarid impaction.



### What do I do after the first deworming?

The AAEP recommends that foals be dewormed for a second time just before weaning at around 6 months of age. At this time, a fecal egg count is also recommended to see if your horse is carrying more ascarids or strongyles, another parasite that more often affects horses as they age. Treatment will depend on which parasite is present.

The third and fourth dewormings should take place at around 9 and 12 months, and should target the population of eggs most prevalent on fecal exam (most likely strongyles at this age). As your horse ages, it is also best to get him/her on a schedule where tapeworms are targeted during their peak season, which is once yearly in late summer/early fall in Indiana.

Parasitologists currently state that yearlings and 2 year old horses should be thought of as high parasite egg shedders and should be treated several times during the “parasite season” with effective drugs. Work with your veterinarian to help you establish an effective program on your particular farm to prevent ascarid impaction in your foals and weanlings.



#### References:

- American Association of Equine Practitioners website. AAEP Parasite Control Guidelines. Available at: <http://www.aaep.org/custdocs/ParasiteControlGuidelinesFinal.pdf>. Accessed July 13 2016.
- Kaplan RM. Anthelmintic resistance in nematodes of horses. *Vet Res* 2002;33:491-507.
- Kaplan RM. Drug resistance in nematodes of veterinary importance: a status report. *Trends Parasitol* 2004;20: 477-481.
- Kaplan RM. and Nielsen MK. An evidence-based approach to equine parasite control: It ain't the 60s anymore. *Equine Vet Educ* 2010;22:306-316.
- NC Cribb, NM Coté, LP Bouré & AS Peregrine. Acute small intestinal obstruction associated with *Parascaris equorum* infection in young horses: 25 cases (1985-2004). *New Zealand Vet J* 2006, 54:6, 338-343.
- Nielsen MK, Donoghue EM, Stephens ML, Stowe CJ, Donecker JM, Fenger CK. An ultrasonographic scoring method for transabdominal monitoring of ascarid burdens in foals. *Equine Vet J* 2015;0:1-7.

## Anhidrosis

(continued from cover)



There are several theories as to what causes anhidrosis, but the origin remains unknown. Recent research suggests that the condition more likely stems from the sweat glands not responding to the stimulation to secrete sweat rather than the inability of the body to realize that it should be sweating. One type of test for anhidrosis involves several injections of a drug under the skin which typically causes sweating within five minutes. If a horse is not anhidrotic, sweat will appear at most (if not all) of the injection sites. Horses that are slightly anhidrotic may have sweat appear at a few of the sites, whereas those truly affected will not sweat at all. An alternative test involves lungeing your horse for thirty minutes on a hot day. Baseline measurements of heart rate, temperature and respiration are measured prior to lungeing at the trot for 30 minutes during hot temperatures. The same measurements are taken post-exercise and the horse is monitored for its ability to sweat during exercise and ability to recover from the work. If the horse does not return to its baseline respiratory rate thirty minutes after exercise, or has delayed recovery of rectal temperature, it indicates that they are having trouble cooling down.

The ultimate solution for anhidrotic horses is moving to a cooler, less humid environment. Many anhidrotic horses once again achieve adequate sweat production upon removal to a cooler climate. If the horse cannot be physically removed to a cooler climate, there are several ways to manage an anhidrotic horse and lessen the risk of heat stress and heat stroke. Once you realize your horse is not sweating appropriately, stop working, immediately move to a cooler location, and decrease your horse's body temperature via the use of fans, air conditioners, misters and/or cold hosing. Electrolyte supplementation can aid in the recovery from an anhidrotic episode and can be administered under the guidance of your veterinarian. A medication is available (clenbuterol) which will cause a horse to sweat and may be beneficial if used sparingly. Clenbuterol is saved for situations when the horse is in a particularly hot environment and is only a temporary treatment. If it is used too often, it may actually worsen the anhidrosis.

Other management strategies include exploring the possibility of concurrent respiratory disease as affected horses are sometimes found to have inflammatory airway disease. Ensuring that your horse is physically fit prior to warm weather can also help to control anhidrosis. Avoid heavy training and competition during summer months. For horses maintained in exercise training during the summer, workouts should be conducted during cooler periods of the day. When working with your veterinarian, try to avoid scheduling procedures that require sedation in hot weather as these drugs typically cause a horse to sweat and the inability to do so may result in extremely high body temperatures.

Until we learn more about this condition, the mainstay of treatment is environmental and exercise management. If you suspect that your horse is not sweating appropriately while working or during periods of hot weather please call your veterinarian to discuss the possibilities of anhidrosis and work together to induce management changes to keep your four-legged friend calm, cool and collected this summer. ➤

# Cattle Food is for Cattle, Not Horses!

By Megan Brunn, DVM Student (Class of 2017)

Edited by Stacy H. Tinkler, DVM, MPH, Dipl. ACVIM, Purdue Large Animal Internal Medicine

It is extremely important that horses never eat grain intended for cattle or other food-animal species. Perhaps you've heard this before, but didn't understand why this is so. This article will help clarify the reasons why your horse should only be fed grain or concentrate specifically formulated for horses and should never receive foodstuffs or medicated mineral blocks intended for animals such as cows, goats, sheep, llamas, alpacas, pigs, or chickens.

Different species have different nutritional requirements for growth and maintenance of good health. Each type of feed is specialized for that species to provide adequate nutrition for ONLY that species. So if you feed horse grain to a sheep or vice versa, the animal will receive a feed that is deficient in some nutrients and in excess or even toxic amounts of others. For example, copper requirements vary a great deal between species. Horses require more copper than sheep or camelids, so if a sheep, llama, or alpaca is fed horse feed, over time the copper in their system will accumulate and can increase to a toxic level. The excess copper will then extensively damage the liver and red blood cells and too much can be fatal for the ruminant or camelid.

In addition to different nutrient requirements, feeds intended for food-animals or camelids may contain substances that are toxic to horses, even in extremely small amounts. An example of a harmful feed additive is the ionophore antibiotic monensin (Rumensin ©), a common additive in ruminant and poultry feeds. Monensin acts to prevent overgrowth of coccidia parasites (i.e. it is a coccidiostat) and is also used as a growth promotant in the species that can tolerate it. Monensin is extremely toxic to horses. It causes severe muscle damage, including the heart muscle, which can lead to heart failure and death. Just a handful of cattle feed containing monensin or one of the other ionophore antibiotics can be fatal to a full-sized horse. If a horse doesn't die immediately from acute monensin toxicosis, it can suffer from chronic heart problems for the rest of its life. This will severely affect performance and can sometimes result in the horse's death months to years after

ingestion of the toxic feed. Since such a small amount of monensin can be fatal to horses, extreme care must be taken if it is present on a property where horses are housed. Whenever horses and ruminants are at the same location, monensin-containing grain needs to be clearly labeled and separated from horse grain. Additionally, ruminant feed should be kept locked up so that horses cannot



accidentally ingest it in the event they get loose and raid the feed room. A grain container that has held medicated ruminant feeds needs to be cleaned out completely before adding horse feed to it. Even the traces of monensin that remain on the walls of uncleaned feed containers have resulted in toxicity when horse grain was later added to these contaminated containers.

Other compounds that are sometimes added to food-animal grains such as antibiotics or the other coccidiostats lasalocid and decoquinate are not as toxic as monensin but can cause problems if given to horses.

Knowledge of the problems that occur when horses ingest food intended for ruminants, poultry, swine, or camelids is the first step towards preventing accidental toxicoses in your animals.

If you are ever unsure of what feed to give your animal, stick with hay or forage until you have had a chance to talk to a veterinarian or animal nutritionist for advice on what feed is appropriate.



## References:

- Smith, B. (2014). *Large Animal Internal Medicine* (5th ed.). London: Elsevier Health Sciences.
- David G. Schmitz, Chapter 20 - Toxicologic Problems, In *Equine Internal Medicine* (Second Edition), edited by Stephen M. Reed, Warwick M. Bayly and Debra C. Sellon, W.B. Saunders, Saint Louis, 2004, Pages 1441-1512, ISBN 9780721697772, <http://dx.doi.org/10.1016/B0-72-169777-1/50022-6>. (<http://www.sciencedirect.com/science/article/pii/B0721697771500226>)
- Novilla, M. N., DVM, PhD, & Thomas, E. E., PhD. (2016, August). Ionophore Toxicity in Horses [TeckTalk, Scientific Update by Elanco Animal Health]. Greenfield, IN. [http://www.admani.com/horse/Horse%20PDFs/TECHTALK\\_IonophoreTox\\_Horses.pdf](http://www.admani.com/horse/Horse%20PDFs/TECHTALK_IonophoreTox_Horses.pdf)

# Phenylbutazone: Plutonium or Panacea?

By Janice Kritchevsky, VMD, MS, Dipl. ACVIM, Purdue Large Animal Internal Medicine

Phenylbutazone, or “bute” is probably the most common pain killer given to horses, but remains one of the most misunderstood drugs in the equine medicine cabinet. Here’s what you need to know when your veterinarian prescribes phenylbutazone to your horse.

## What is it?

Phenylbutazone belongs to the class of drugs called non-steroidal anti-inflammatory agents, or NSAIDs for short. Other NSAIDs labeled for use in horses include Banamine and Equioxx. The most famous NSAID is aspirin, and all other NSAIDs work in a similar manner. NSAIDs work by stopping the production of prostaglandins, which are important substances made by the body when there is inflammation, fever, or pain.

## Dosing

Imagine if you had a broken bone and your doctor told you to take an aspirin. You would probably think “You have got to be kidding, this isn’t going to help at all.” What is more, taking an entire bottle of aspirin wouldn’t take that type of severe pain away either. Phenylbutazone is exactly the same, it can relieve a certain degree of pain, but there is a ceiling for how much relief it can provide. Giving more “bute” than the recommended amount just increases the chances of side effects. Additionally, combining “bute” and Banamine or another NSAID (a practice known as “stacking”) is no better than giving a higher amount of either drug.

To summarize, it is important only to give the appropriate dose of phenylbutazone and no more. There are two reasons for this. Most importantly, giving an overdose can quickly lead to toxicity problems. The second is that it won’t provide any more pain relief than the appropriate dose.

## Toxicity

Phenylbutazone is toxic if given at too high a dose. Just like the aspirin some people take for their hearts, however, a horse can be given the appropriate amount of “bute” for months or years with no ill-effects. It is important to give no more phenylbutazone than is recommended on the label.

The label for the 20% injectable solution states “1 to 2 grams of phenylbutazone per 1000 lb body weight” while the paste formulations are labeled for “1 to 2 grams of phenylbutazone per 500 lb body weight, but not to exceed 4 grams daily.” If your horse weighs

1,000 pounds, which is the average for an adult light horse, following those instructions is easy. But accurate dosing becomes difficult as the body weight of the patient decreases. The label instructions can be difficult to scale down when dealing with a 250 pound miniature horse or a 100 pound foal. Unless you are giving “bute” to a healthy, adult horse, it is much better to dose in milligrams (mg) of drug per kilogram (kg) of body weight. Phenylbutazone can be dosed safely at a 4.4 mg/kg twice a day for the first day and then 2.2 mg/kg twice a day for four days, and then 2.2 mg/kg once a day from then on. A 250 pound miniature horse weighs 113 kg, and thus should receive no more than half of a gram on the first day of treatment then down to one quarter of a gram after that. The 100 pound foal should get no more than 99 mg, which is one tenth of a gram. As you can imagine, it’s almost impossible not to overdose smaller horses or foals when trying to give the paste, and it is safest not to try.

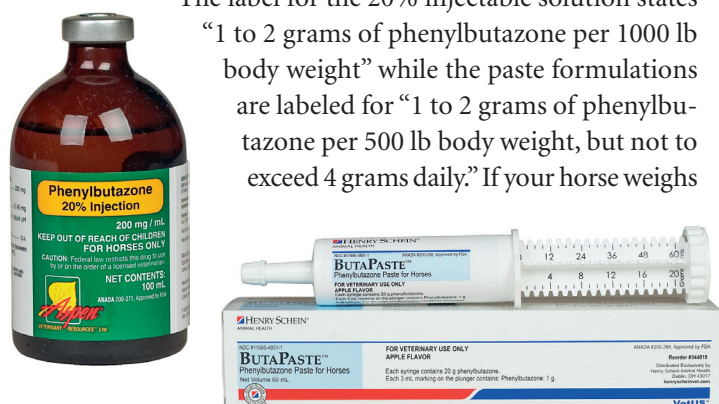
Phenylbutazone toxicity results in low blood proteins, and mouth, stomach, and intestinal ulceration. Occasionally kidney failure and inflamed colons can occur as well. It is important to note that some horses are more sensitive to the effects of NSAID drugs than others, and may develop ulcers or other issues at lower doses.

## What are your alternatives?

The other NSAID drugs on the market have fewer toxic effects than phenylbutazone, and may be better tolerated by sensitive horses. Unless one has an accurate scale weight and the means to give it the exact amount needed, “bute” should not be given to foals as they are particularly sensitive to its toxic effects. If a horse is still in a great deal of pain after giving the labeled amount of “bute”, one can try other methods instead of or in addition to the NSAID. Call your veterinarian at once if a NSAID does not produce the expected relief, it could mean that the problem is more severe than originally believed.

## Bottom Line

Phenylbutazone is a cost-effective pain killer that can be your first line of defense in horses that are suffering from a wide number of injuries and problems. It is safe in the majority of horses when given at the recommended dosage, even when given for prolonged periods of time; however, phenylbutazone should never be given at higher doses than are listed on the label in any horse. When treating horses, ponies, and foals less than 500 pounds, the precise mg per kg dose should be calculated and given. If this is not possible, then another form of pain relief should be used. ↻







Nonprofit Org.  
U.S. Postage  
PAID  
Purdue University

## EQUINE HEALTH UPDATE

is published by:

**Purdue University**

**College of Veterinary Medicine**

**Equine Sports Medicine Center**

1248 Lynn Hall

West Lafayette, Indiana 47907-1248

**ADDRESS SERVICE REQUESTED**

Phone: 765-494-8548

Fax: 765-496-2641

[www.vet.purdue.edu/esmc/](http://www.vet.purdue.edu/esmc/)

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 Tinkler S.

Design & layout by:

Elaine Scott Design

EA/EOU



## *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:

[www.vet.purdue.edu/esmc/](http://www.vet.purdue.edu/esmc/)



Continuum© by Larry Anderson

Purdue University is an equal access/equal opportunity/affirmative action university.

If you have trouble accessing this document because of a disability, please contact PVM Web Communications at [vetwebteam@purdue.edu](mailto:vetwebteam@purdue.edu).