



# Southern Equine Consortium

Providing research-based information for horse owners and equine operations in the Southeast region.

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## Understanding Stereotypic Behaviors in Horses: Parting with the Term "Stable Vices"

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Stereotypic behaviors are defined as repetitive, relatively unvarying patterns of behavior with no obvious goal or function. A horse that displays stereotypic behavior tends to perform the behavior in nearly the exact same way every time, and many horses also perform the behavior in a preferred location, e.g. in a specific area of the stall or paddock. The performance of stereotypic behavior has been used as an indicator of poor welfare, although it is often difficult to determine whether the behavior is the result of poor welfare in the past or due to current unfavorable conditions. This article will introduce horse owners to stereotypic behaviors in horses, what has been learned about stereotypic behaviors through science, and how this information can be applied in order to better manage and thus improve the welfare of horses with stereotypic behavior.

Stereotypic behaviors (STBs) are often referred to as "stable vices", e.g. in popular press equine publications and in older equine textbooks. However, we are now moving away from using this terminology to describe stereotypies as research studies are demonstrating these behaviors are not simply the result of boredom. These behaviors are not attempts by the horse to be a nuisance to their owner and should not be considered to be the fault of the horse. Although the exact, underlying cause(s) of STBs remain unknown, we have gained a better understanding of how, or rather why, stereotypic behaviors develop in horses. The development and continued performance of stereotypic behaviors appear to have a physiological or psychological basis.

### Oral Stereotypies

Most survey studies conducted to date (Wickens and Heleski, 2010), show 4-5% of the average horse population engage in an oral STB, such as cribbing, crib-biting or wind sucking. The typical cribber places its front teeth on an object, such as a fence board, pulls back while sucking air inward, and then emits a grunting noise. This behavior is distinctive both to see and to hear. Some evidence suggests that these behaviors are the result of 'feel good' neurotransmitters in the horse's brain, which is probably why the behavior seems so addictive and so challenging to stop once started.



Two horses take turns cribbing on a post in the pasture.  
Photo Credit: Dr. Carissa Wickens.

### Is Cribbing the Same as Wood Chewing?

It should be noted that cribbing and wood chewing are NOT the same thing. Wood chewing is actually a normal, natural behavior that even horses in the wild will perform. On the other hand, feral horses have never been observed cribbing. Wood chewing is

## **Stereotypic Behaviors in Horses, continued.**

sometimes classified as a redirected grazing behavior, particularly in horses on limited forage diets. There is a possibility that wood chewing behavior will precede a horse becoming a cribber, but evidence of this is limited.

### **Locomotor Stereotypies**

There are two reasonably common locomotor STBs observed in horses. One is called weaving, where horses shift their weight back and forth on their front legs (a repetitive, side to side swaying motion). This is often performed when standing at the front of the stall or next to a paddock gate. It often coincides with anticipation of something, e.g. awaiting morning turn out or while waiting to receive feed. The second is called box walking or stall walking, and it literally means to walk part or all of the horse's box stall (or paddock) perimeter.

### **Risk Factors for Developing STBs**

Though direct cause and effect research on this topic is limited, multiple studies involving thousands of horses have consistently found the following factors to be associated with increased likelihood of engaging in a STB (Wickens and Heleski, 2010):

- Insufficient/very limited turnout time
- Insufficient/very limited opportunities to socialize with other horses
- Insufficient/limited grazing/foraging opportunities – this factor often goes hand-in-hand with high concentrate diets, which have also been implicated.

Stressful weaning, particularly an abrupt method with individual housing, has been associated with increased STBs in several studies. Additionally, there has been evidence that young stock with gastric ulcers are more likely to be crib-biters. In one particular study, supplementing young horses' feed with an antacid improved the condition of the stomach and tended to reduce the amount of time horses spent cribbing. Differences in brain physiology responsible for goal directed and reward seeking behavior have also been demonstrated between horses with STB and horses who do not show these behaviors.

Some factors are more ambiguous, such as stallions being more prone to engage in STBs, "stressful" riding disciplines being more prone to result in STBs, certain genetic lines being more likely to crib or to weave, and horses recovering from illness or injury being more likely to start a STB. However, in most of these particular cases, careful assessment will also note that turnout time, social interaction and foraging opportunities are also likely limited.

### **Commonly Held Beliefs**

Contrary to popular opinion in the industry, there is no scientific proof that horses learn STBs from one another. Anecdotal, when stereotypic horses are turned out to pasture with non-stereotypic horses (those horses who do not display a STB), the non-stereotypic horses do not pick up the STBs. There is however less consistent evidence when it comes to housing non-stereotypic horses next to or across from stereotypic horses in environments involving the risk factors mentioned above.

### **Do STBs Cause Damage?**

Cribbers may cause damage to their teeth, and as such may need additional dental care. Cribbing can be hard on fencing and stall boards. Weavers and stall walkers may cause more wear and tear to their feet, thus potentially needing more farrier care. They may also cause ruts or wear in the flooring in their stall or paddock. In general, though, these potential damages tend to be exaggerated leading to some horses with STB being turned away from certain boarding or training centers. Hopefully, with increased understanding of STBs, this bias will subside.

### **Should I try to stop it? And if so, how?**

If you own or manage a horse with a STB, the recommendation is to learn as much as possible about that particular behavior. Stereotypic behaviors are recognized as both a welfare and a management concern and many owners attempt to physically prevent the behavior. Attempts to physically prevent STBs can result in reduced welfare for the horse and additional strain on the owner's pocket book. Therefore, strategies aimed at addressing the behavior should include consideration of potential causal factors and implementation of management practices known to help reduce the behavior (e.g. increased opportunities to socialize with other horses and to graze/consume forage). Some horses will engage in their stereotypic behavior so much that it reduces their time spent on consuming adequate feedstuffs to maintain a desired body condition. For cribbing, some owners have had success with the various

## Stereotypic Behaviors in Horses, continued.

cribbing collars and/or anti-cribbing muzzles that are on the market. Care should be taken when turning horses out as many of the collars do not have breakaway mechanisms in the event of entanglement. Also, even a well-fitted collar or muzzle will often create rub lesions on the horse's head potentially resulting in sensitivity around the poll. Do not be surprised if your horse resists having the cribbing collar/cribbing muzzle placed on them.

An owner can try to make cribbing surfaces less desirable by coating them with an aversive substance (such as peppery liquids) or running an electric wire on the top or inside of fence lines. However, some crib-biters are determined and may learn to perform their stereotypy on other surfaces (e.g. waterers, hay rings, or even other horses). Always remember that somewhere along the way, the horse developed this STB because it was likely trying to 'cope' with a suboptimal husbandry situation. If we view it as a coping mechanism, how certain are we that we should take away the horse's ability to cope? Multiple studies have shown that, when presented with a stressor, the horses who handled it least well were crib-biters who were prevented from cribbing; non-cribbers did fine, and cribbers who were allowed to crib were fine, but cribbers who were thwarted were more stressed.

The authors do not advocate cribbing surgery, but some owners have found it to be successful. We also do not advocate the use of electronic collars to "stop" stereotypic behaviors. Anecdotal evidence suggests that the stimulation level has to be continually turned up to stop a horse from cribbing, which says a great deal about a cribber's motivation to engage in the behavior.

With respect to the locomotor stereotypies, some owners have had success in reducing their horse's weaving or box-walking by increasing the visual horizons; e.g. placing the horse in a stall with a window to the outdoors or with an acrylic/shatter-proof mirror, adding an anti-weave stall front that allows the horse to have its head and neck out to the aisle, or simply keeping the horse out at pasture more of the time. Based on the authors' experience and anecdotal reports from owners it appears much easier to reduce the time a horse spends engaged in a locomotor STB than an oral STB.

### **Conclusion**

Just because your horse performs a stereotypic behavior, such as cribbing or weaving, does not mean its current state of welfare is suboptimal, but more likely, that at some point in the horse's history, the horse was trying to cope with stressors outside the behavioral demands of the horse's nature. Managing stereotypic behaviors can be very challenging. The best management strategy continues to be prevention by trying to optimize turn out time, social interaction and grazing/foraging opportunities. Minimizing stress during the weaning process is important, and working hard to enhance natural behaviors when horses are on stall rest for injuries or illness can help reduce the chance that your horse will develop a STB. Allowing "horses to be horses" with respect to being able to perform more of their normal, natural behaviors, will go a long way towards reducing behavioral problems and improving horse welfare.



Horse stalls with an anti-weave grill may help reduce weaving behavior.

Photo Credit: Dr. Carissa Wickens

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## Equine Parasite Control: Moving Beyond Rotational Deworming

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Photo Credit: Dr. Duberstein

Parasite control in the equine industry is primarily accomplished through deworming programs that implement the use of anthelmintics (dewormers). The previous (and still commonly used) recommendation for treatment of parasites was a rotating program of anthelmintics on an approximate 8 week schedule. Many horse owners still implement this outdated recommendation today without realizing that newer recommendations have been released by the American Association for Equine Practitioners (AAEP) due to increasing incidence of parasite resistance to dewormers.<sup>1</sup>

Currently, there are three main classes of anthelmintics: benzimidazoles (fenbendazole, oxbendazole), tetrahydropyrimidines (pyrantel) and macrocyclic lactones (ivermectin, moxidectin). The practice of rotating dewormers dates back to 40+ years ago and was used to combat the most prevalent parasite in equines, large strongyles (*Strongylus vulgaris*). Fortunately, this program mostly eradicated large strongyles, and today the main parasite of concern in adult horses is cyathostomins (small strongyles). Small strongyles have a different lifecycle than their large strongyle counterpart and have a unique ability to encyst in the gut wall when conditions are not favorable for their survival. Because of this, and the fact that most anthelmintics kill only those parasites that are in the lumen of the gut (e.g., not the encysted strongyles), the practice of regularly rotating anthelmintics has actually led to resistance in small strongyle populations. Resistance to anthelmintics is assessed using a fecal egg count reduction test (FECRT) in

which fecal egg counts are assessed before anthelmintic treatment (deworming) and again at 14 days after anthelmintic treatment. Resistance would be defined as the failure of the drug to have a high fecal egg count reduction in this 14 day period. In a 2004 study, it was shown that the percentage of farms in the southern United States found to harbor resistant small strongyles was 97.7% for fenbendazole, 53.5% for oxbendazole, and 40.5% for pyrantel pamoate.<sup>2</sup> In this study, 0% of farms harbored small strongyles that were resistant to ivermectin, however, it has been recently shown that resistance to ivermectin is common in another equine parasite, ascarids. Additionally, the effectiveness of a deworming agent can be measured by the egg reappearance time (ERP) which assesses the length of time after deworming before eggs are present again in the fecal samples of a treated horse. The ERP for small strongyles after treatment with ivermectin or moxidectin has been decreasing, meaning parasites are coming back faster than they did when the drugs were first marketed. For all of these reasons, the current recommendations for deworming programs are much different from the rotational deworming program that was implemented 40+ years ago. In spite of all of the recent compelling evidence to move away from regular rotational deworming, many horse owners still follow this outdated method. If this trend continues, the equine industry may be faced with a similar problem that sheep and goat owners have today—high parasite resistance to all classes of dewormers with almost no effective treatment to combat parasitic infections.

So what are the current deworming recommendations and how can horse owners help in preventing continued resistance problems? First, move away from rotational deworming. It has been shown that rotating classes of dewormers does not result in less appearance of parasite resistance. Since small strongyles show significant resistance to three of the four classes of dewormers, rotating anthelmintics is not recommended. Ivermectin (or moxidectin) should be the basis of a deworming program for adult horses. In most cases, one to two deworming treatments per year is sufficient to prevent infection of large strongyles and to treat for other parasites such as tapeworms and bots (treatment of tapeworms requires the use of praziquantel which is included only in some ivermectin/moxidectin dewormers). Deworming treatments should occur when parasite loads are highest, typically in the fall and spring in the southeastern United States when parasite larvae populations in pastures tend to be the highest (extreme heat or cold reduces pasture levels of infective parasites). Any treatment beyond this should be done based on the small strongyle egg shed rate of the individual horse. This means that rather than deworming all horses multiple times a year, instead individual fecal egg counts should be performed and only those horses with

## Selective Deworming, continued.

high fecal egg counts should be dewormed. Fecal egg counts are most easily done by a licensed veterinarian, though an individual can become trained to perform these if they have the proper equipment. Horses are typically classified as low, moderate, or high egg shedders based on the amount of small strongyle eggs per gram (EPG) present in their feces with the following scale being commonly used: low (<200 EPG), moderate (200-500 EPG), and high (>500 EPG). It is important to understand that horses that are higher shedders don't necessarily have higher populations of internal parasites; differences in age and immune status of each horse influences the number of eggs they shed. However, moderate and high egg shedders result in greater transmission of infective parasite larvae in pastures and therefore are the target of selective deworming programs at more regular intervals throughout the year. Some low shedding horses may only need to be dewormed once a year, whereas high shedders may need to be dewormed more frequently throughout the year to reduce pasture transmission of parasites. Working with your veterinarian to develop a selective deworming plan is the best way to combat parasite resistance on your farm.

It is also important to look at the life stage of your horse. Young horses (particularly foals) are more prone to ascarids than older horses. Due to the fact that ascarids show high resistance to ivermectin, deworming programs for foals, particularly prior to weaning, should implement the use of benzimidazoles starting at about 2-3 months of age and again around 4-6 months of age. Following weaning, a fecal egg count can help assess whether ascarids or strongyles are more prevalent in the individual horse and guide which anthelmintic is the best choice. Since younger horses are considered more susceptible to parasites, yearlings and two year olds should be classified as high shedders and dewormed more frequently with the appropriate anthelmintic based on fecal egg tests.

Finally, it should be noted that there are other, non-chemical, methods that horse owners can implement to reduce parasite populations. Rotational grazing, grazing with other species, and manure removal and composting are management practices that can help reduce parasite transmission from grazing. Implementing good pasture management practices while working with a veterinarian to develop individualized deworming plans for horses on your farm will go a long way in combating parasite resistance so that we have effective anthelmintics for years to come.

### References:

<sup>1</sup>AAEP Parasite Control Guidelines, Developed by the AAEP Parasite Control Subcommittee of the AAEP Infectious Disease Committee; [https://aaep.org/sites/default/files/Guidelines/AAEPParasiteControlGuidelines\\_0.pdf](https://aaep.org/sites/default/files/Guidelines/AAEPParasiteControlGuidelines_0.pdf)

<sup>2</sup>Kaplan R.M. and Nielsen M.K., An evidence-based approach to equine parasite control: it ain't the 60s anymore. 2010. Equine Veterinary Education, 22, 306-316

## What's Bugging Your Horse?

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The life cycle from egg to adult in ideal conditions for house flies is 6.5 days, for stable flies is 10-14 days, and for horn flies is 21 days. Photo Credit: Dr. Butler

If you own horses, you will certainly have flies. Horses, horse manure and even horse feed are powerful attractants to a large number of fly species. Though flies are seasonal, the mild winter climates of the southeastern states provide ideal conditions for some species of fly pests year round. Understanding the seasonal patterns of these pests, the conditions that are hospitable to their reproduction and their feeding behaviors will help horse owners develop strategies to protect their animals.

The most common fly pests of horses in the southeast are stable flies, house flies, tabanids (horse, yellow and deer flies), mosquitoes, horn flies and culicoides (no-see-ums). Life cycles of flies vary but they are time dependent upon temperature and moisture. The life stages include egg, larva, pupae and adult.

Stable flies thrive in cooler, wet months when hay residue is available as a breeding medium. These flies are persistent blood feeders delivering a painful bite. Both male and females take blood meals during the day and the



## What's Bugging your Horse? continued...

preferred feeding site is the lower legs. If you see a lot of foot stomping, it is likely that your major problem is stable flies. Cleaning up hay residue, composting manure and dragging pastures are the best methods of control.

House flies can develop in almost any decaying matter but horse dung is a favorite breeding medium. Though house flies do not bite, they typically leave a vomit droplet along with a fecal drop when they visit a feeding site. Thus, they can serve as mechanical transmitters of harmful microorganisms and are an intermediate host for stomach worms in horses. Due to a very short life cycle, house flies can establish very large populations in a short time. Keeping feed covered, stopping dripping faucets, emptying the manure spreader at least every other day are all methods of limiting breeding.

Tabanids include several fly groups, most notable the horse fly, deer fly and yellow fly. The females take blood meals by inserting their bayonet-like mouthparts into the horse, creating a wound and lapping up the blood. Horses react to the bite and often dislodge the fly, interrupting the meal. The fly then makes another wound and continues feeding until full. They also inject an anticoagulant into the wound so the blood drip remaining is an attractant to other flies. They only produce one generation per year in marshy areas and emerge in early summer. This makes them very difficult to control.

Mosquitoes require water to lay eggs and have a relatively short life cycle under good conditions. During dry weather, mosquito numbers may be low but 10 days after a rain event, the hatch rate will be noticeable. Mosquito bites are not only irritating; mosquitoes may transfer diseases like Encephalitis or West Nile. It is critical that horse owners vaccinate prior to the June rainy season so that horses will be protected when mosquitoes emerge. Boosters will need to be given throughout the year based on where you live, the amount of standing water and rainfall patterns which dictate mosquito prevalence. Most mosquitoes feed from dusk until dawn and are not strong fliers. Bringing horses inside in the evening and running fans can limit the number of mosquitoes your horses are exposed to.

Horn flies are cattle pests and the horse is a dead end host. Horn flies remain on the host animal at all times, only leaving to lay eggs in *fresh cow patties*. If your horses are near cattle pastures, you will likely see horn flies on their backs and bellies. Though they take blood meals and are a certainly a nuisance, they are of little economic consequence to horses.

Culicoides, also known as no-see-ums, punkies or biting midges are small flies that feed on the ears, neck, chest, belly and tail of horses. Many horses are hypersensitive to these pests and will develop what some refer to as muck itch. They feed at dusk and dawn but do not seem to like to come indoors. Fans and housing horses indoors at night may limit exposure. Application of fly spray in the evening is also helpful.

Fly control is best accomplished by using several management strategies. Flies need breeding materials, optimum moisture and adequate warmth to complete their life cycles. Elimination of breeding materials, control of moisture, mechanical control (fans or traps) and judicious use of insecticides in combination is the best approach. Good sanitation, composting, use of fans and removal of standing water are relatively inexpensive, environmentally friendly approaches to fly control. They will also get you high marks with the neighbors.



Pupal cases can be found under hay residue.  
Photo Credit: Dr. Hogsette



Thousands of larvae may be living under bedding.  
Photo Credit: Dr. Hogsette



Horn flies will only lay eggs in fresh, warm cow dung.  
Photo Credit: UF/IFAS

## What's Bugging your Horse? continued...

Several relevant EDIS publications can be found at: [http://edis.ifas.ufl.edu/topic\\_horse\\_pests](http://edis.ifas.ufl.edu/topic_horse_pests)



Dispersing stall waste in this way only encourages fly breeding. Creating a compost pile with stall waste and covering it to control moisture is a great way to turn manure into an organic fertilizer.

Photo Credit: UF/IFAS

## Considerations for an Effective Teeth Floating Program

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Imagine sharp points on your teeth that rub your mouth or cheeks while you chew your meals. Considering that horses' teeth continue to grow as he ages, this is an expected occurrence when attempting to eat grain or simply graze in the pasture. Adding to an already tremendous dilemma, a horse will chew in an unnatural form and consequently cause damage to other teeth and parts of the mouth while attempting to subdue some of the pain.

Twice each year, your horse should be having a dental examination to determine if he or she needs their teeth floated. Horses that are under 10 years old should be examined twice per year. These examinations should begin as early as possible for foals. Floating a horse's teeth is defined as - using a rasp (both by hand and power tools) to file down these rough edges on a horse's tooth. The filing doesn't hurt (no nerves there) and make chewing much easier and comfortable.

Many horses can go a few years in between each floating, but there are also many that require floating once or twice a year. It is a good rule of thumb to get teeth checked while conducting early spring vaccinations; and again in the fall when preparing for fall care of your horse. Please see photos for an example of teeth going too long without a floating.

A thorough dental plan can extend the life of your horse greatly and allow their behavior to be much more pleasant and predictable.

Some symptoms of a horse that may need his or her teeth floated:

- Difficulty chewing (accompanied by ears pinning and tail swishing)
- Reluctance to drink cold water
- Quidding (dropping food while eating)
- Excessive unchewed grain in manure
- Constipation colics
- Weight loss
- Swelling or tenderness in jaw area
- Reluctance to accept a bit (raises head high while bridling)
- Throwing head while riding
- Throwing head while stopping
- Reluctance to turn a certain direction while riding
- Excessive slobbering
- Turning their heads to the side when they chew
- Snotty nose from only one nostril
- Foul odor from mouth or nostrils





## Hurricane Preparedness

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Hurricane season is upon us. The Southeastern US is no stranger to hurricanes, and this year is predicted to be potentially more active than recent years. Here are some tips to help prepare your horses and your farm for a storm.

### Before the Storm

Vaccinations: All horses should have a tetanus toxoid vaccine within the last year. Due to the increase in mosquitoes after massive rainfall, all horses should also receive West Nile Virus and Eastern/Western Encephalitis vaccines at the beginning of the hurricane season.

Coggins Test: A negative Coggins current within 12 months will be necessary if the horse needs to be evacuated to a community shelter or across state lines.

Health Certificate: A health certificate (completed by your veterinarian) is required to cross the state line. This may be necessary if you live in a region that is near a state border. A health certificate is valid for 30 days.

Identification: Each horse should have at least 2 forms of identification (in case one is lost). Make sure to have proof of ownership, including recent photos of the horse that show any identifying marks/scars/coloration, ready in the event that you need to claim a loose horse. Examples of possible identifying methods include:

- ⇒ A well fitted breakaway halter (a regular halter can get trap a horse and possibly strangle them!) with contact information (can be in the form of a luggage tag, a metal ID tag, a zip lock bag secured with duct tape to the halter)
- ⇒ A luggage tag with ID braided into the mane or tail (make sure it is water proof).
- ⇒ Livestock marker - write your phone number on the horse's hindquarters with a waterproof livestock marker
- ⇒ Microchip
- ⇒ ID bands that go around the horse's neck

Evacuation Plan: Hurricanes generally give us at least a day's notice or two before coming into contact with land. Make sure that you have a written evacuation plan for your horses, especially if you are in a low-lying area, a flood plain, near water, or are near the coast. If you will be in the path of the hurricane, it is highly recommended to evacuate prior to the storm, as transportation with horses when wind gusts are over 40mph is hazardous. Decide at which point you will evacuate (for a category 1, 2, 3, 4, or 5 storm?). Also prioritize NOW which horses will be evacuated and in which order if you will have to make more than one trip.

- ⇒ Determine two evacuation centers (in opposite directions). For a list of evacuation centers in your state, contact your Equine Extension Specialist.
- ⇒ Ensure that your truck and horse trailer are ready for travel (tires in good condition, etc.). Ensure that the vehicle is full of gas.

Water: Power loss often occurs with hurricanes, and many horse farms may find that they are unable to provide water to their horses during an outage. Each horse should have 12-20 gallons of water stored per day. Store a minimum of 72 hours of water for all horses on the property. Fill all available water troughs. Be creative with your water resources! Line garbage cans and various storage bins or muck buckets with plastic contractor bags and fill them with water. Consider a generator to run the well if you have large numbers of horses. Keep chlorine bleach on hand to add to contaminated water if necessary. To purify water, add two **drops** of chlorine bleach per **quart** of water and let stand for 30 minutes.

Feed: Store a minimum of 72 hours of feed and hay (seven days is best) per horse. It is very possible that roads will be closed because of down power lines, washout, and trees and that you will not have access to feed for a



period of time after the storm. Cover hay with water proof tarps and store on pallets. Keep grain in water tight containers in the event of flooding.

**Farm Preparation:** Secure all moveable objects. Remove all items from hallways. Secure jumps, lawn furniture, etc. in a secure place. Place all large vehicles/tractors/trailers in an open field where trees cannot fall on them. Turn off electrical power to the barn to avoid any potential fire hazards with power surges or lightning strikes. Secure all gates. Ensure that all emergency tools are working properly and readily available. These include:

Chain saw	Wire cutters/tool box/pry bar
Fuel	Fire extinguisher
Hammer/nails	Duct tape
Fence repair materials	Fuel for generator/tractor

**Emergency First Aid Kit:** Make sure that you have an emergency first aid kit ready and accessible (and waterproof!). Have any medications that a horse will need easily accessible and ensure that you have enough to get you through the storm and the aftermath. Some items that should be included:

Bandages (leg wraps and quilts)	Pain relievers (bute, banamine, etc.)
Antiseptics	Flashlight with extra batteries
Scissors/knife	Extra halters/lead ropes
Topical antibiotic ointments	Clean towels
Tranquilizers	Fly spray/swat

## **During the Storm**

**In or Out?** Should horses be left in the pasture or in the barn? Recommendations from the American Association of Equine Practitioners say that if the pasture has good fencing and limited trees, it is probably best to leave horses outside. Well-constructed pole-barns or concrete block barns may provide safety from flying debris, but the horses may become trapped if the wind collapses the building. If you have a sturdy shelter with access to a small, safe paddock, this would be ideal. A horse could escape the building if needed into a safe area.

- Keep horses out of pastures and areas with electrical lines. If these come down, they can electrocute the animals nearby.
- Trees with shallow roots will fall easily under hurricane force winds and can injure horses or destroy fencing.
- Do not keep horses in areas secured by barbed wire, electrical wire, or high tensile wire during a hurricane.
- Fire ants and snakes will search for high ground during flooding. Keep this in mind when selecting an area to keep your horses if they are to remain in pasture.

## **After the Storm**

**Inspect Animals:** Carefully inspect all horses for injuries, focusing particularly on the eyes and limbs.

**Inspect Property:** Look for down power lines, fence damage, and misc. debris. Take photos of storm damage to present to insurance companies.

**Missing Horse?:** If your horse is missing, contact your local county animal control, sheriff's department, veterinarian, and/or disaster response team.

If you have any specific concerns regarding your location and hurricane preparedness, please contact your county extension agent and they can help direct you to the appropriate contacts and resources.

## Potomac Horse Fever Recently Diagnosed in Alabama

Taylor Gwynn, Dr. Soren Rodnig, Courteney Holland, Dr. David Pugh, & Dr. Tony Frazier.

Auburn University & Alabama Department of Agriculture and Industries

Potomac Horse Fever (PHF) was originally identified in the late 1970's as a disease affecting horses in the eastern United States near the Potomac River. However, since then, the disease has been diagnosed in other locations in the United States and Canada, but never in Alabama until recently. This summer, PHF was diagnosed in Alabama horses that had not travelled to regions typically associated with PHF, indicating natural transmission of the disease in Alabama. Potomac Horse Fever is a potentially fatal disease for horses, but is curable if treated early. If you suspect PHF in your horse, contact your veterinarian immediately.

### **What are the symptoms of PHF?**

In the beginning, the symptoms of PHF may be subtle and similar to other intestinal diseases. Initially, an infected horse will often be lethargic and have a loss of appetite, fever, and decreased intestinal sounds. Within about 24-48 hours, horses then develop moderate to severe diarrhea with or without mild colic in about 60% of cases. Any combination of these symptoms may be present. About 20-30% of affected horses will also develop laminitis, which is usually severe and often refractory to treatment. Uncommonly, pregnant mares affected between day 90 and day 120 of gestation may abort their fetus during the last trimester. Foals appear to have a low risk of contracting PHF. The overall case fatality rate is 5%–30%.

### **When does PHF usually occur?**

The disease is seasonal, typically occurring between late spring and early fall, with most cases in July, August, and September with the onset of hotter weather.

### **What causes PHF?**

PHF is caused by the bacteria *Neorickettsia risticii*. The incubation period (the time from exposure to *Neorickettsia risticii* until clinical disease begins) for PHF is about 10–18 days.

### **How is PHF transmitted?**

*Neorickettsia risticii*, the causative agent of PHF, is found in flukes that develop in aquatic snails that are then released by the snails into bodies of water. Aquatic insects such as damselflies, caddisflies, and mayflies can pick up infected flukes, and the primary route of transmission is believed to be accidental ingestion of the insects carrying *Neorickettsia risticii* by horses grazing near or drinking from freshwater creeks, rivers, lakes, or ponds. Even if the horses are not near these bodies of water, precautions should be taken; make sure there is no stagnant water where the horses are kept. This includes proper drainage in pastures, clean water in troughs and buckets, etc.

### **Are horses with PHF a health risk for other horses?**

No. Horses with PHF are not contagious and can be safely housed with susceptible horses. However, PHF is initially indistinguishable from *Salmonella*, which is zoonotic (can be passed from animals to humans) and does pose a health risk to the other horses as well as any other animals and their owners. In order to ensure that the horse does not have *Salmonella*, he/she should be quarantined until fecal test results come back negative. If the results do come back negative for *Salmonella*, he/she can be turned out to normal housing conditions.

### **Are more cases of PHF likely to occur in Alabama?**

Possibly. Since PHF is transmitted by flukes, aquatic snails, and insects, once it has been confirmed in a particular geographical area, it is possible that additional cases will occur in the future. While additional studies are needed to determine the exact role of the fluke, snail, and insect vectors in the complex maintenance cycle of *Neorickettsia risticii*, the fact that there are hosts capable of transmitting this disease in our Alabama environment means that future cases are likely. The frequency of new cases remains to be seen.



### **Can PHF be treated?**

Yes. PHF diagnosis is confirmed by identification of the organism in a blood or manure sample from the horse via PCR tests in the laboratory. Once confirmed to have PHF, affected horses can be treated successfully if your veterinarian is able to administer the proper antibiotics early in the clinical course of the disease. A response to treatment is usually seen within about 12 hours, starting with a drop in rectal temperature, followed by an improvement in appetite and intestinal sounds. If therapy is started soon enough, clinical signs frequently resolve by the third day of treatment. Since PHF causes diarrhea, horses may become severely dehydrated. Electrolytes are recommended until the veterinarian is able to see the horse.

### **Are people or other animals at risk of contracting PHF?**

There is no known risk to human health associated with PHF. Occasional disease caused by *Neorickettsia risticii* has been reported in dogs and cats, but cattle appear to be resistant to infection.

### **Prevention and vaccination**

Minimizing accidental ingestion of insects carrying *Neorickettsia risticii* is the best way to help prevent PHF. For example:

- Turning off barn lights at night for stabled horses, as these lights normally attract the insects carrying *Neorickettsia risticii*.
- Minimize grazing near or drinking from freshwater creeks, rivers, lakes or ponds.

Although vaccination has protected 80-85% of experimentally infected horses, it does not appear to be as protective in the field. Vaccine failure in the field has been attributed to genetic diversity among the greater than 14 different strains of *Neorickettsia risticii* isolated from naturally occurring cases of PHF. Despite this, vaccination is still recommended for horses at risk of contracting PHF.

### **AAEP recommended vaccination schedules for PHF**

The American Association of Equine Practitioners (AAEP) makes the following vaccine recommendations for horses at risk of contracting PHF, but check with your local veterinarian for recommendations in your area.

Due to the seasonal incidence of disease, vaccination should be timed to precede the anticipated peak challenge during the summer months or fall.

- Adult horses, previously vaccinated: The vaccine manufacturer recommends annual revaccination. However, veterinarians may consider an interval of 3 to 6 months for horses in high-risk areas because protection following vaccination can be incomplete and short-lived.
- Adult horses, previously unvaccinated or with unknown vaccination history: Administer a primary series of two doses, at a 3- to 4-week interval. Peak protection occurs 3 to 4 weeks after the second dose.
- Pregnant mares previously vaccinated against PHF: Vaccinate semi-annually to annually. Schedule one dose to be administered 4 to 6 weeks before foaling. To date, no studies have been published that examine the efficacy of PHF vaccines to prevent *Neorickettsia risticii* induced abortion.



Photo Credit: Courteney Holland

## Potomac Horse Fever Recently Diagnosed in Alabama, continued.

- Pregnant mares unvaccinated or with unknown vaccination history: Administer a primary series of two doses, at a 3- to 4-week interval. Schedule so that the 2nd dose is administered 4 to 6 weeks before foaling.
- Foals: Due to the low risk of clinical disease in young foals and the possible maternal antibody interference, primary immunization for most foals can begin after 5 months of age. The manufacturer's recommendation is for a 2-dose series administered at a 3- to 4-week interval. However, as with other killed products, a third dose at 12 months of age is recommended. If the primary series is initiated when foals are less than 5 months of age, additional doses should be administered at monthly intervals up to 6 months of age to ensure that an immunologic response is achieved.
- Horses having been naturally infected and recovered: Administer a primary series (as described above) or booster vaccine (if previously vaccinated) 12 months following recovery from natural infection.

**Please contact your local veterinarian about specific PHF prevention and vaccination strategies for horses living in your area of Alabama.**

### References:

Merck Veterinary Manual <http://www.merckvetmanual.com/SearchResults?query=PHF>

American Association of Equine Practitioners <https://aaep.org/guidelines/vaccination-guidelines/risk-based-vaccination-guidelines/potomac-horse-fever>

