Southern Equine Consortium
Providing research-based information for horse owners and equine operations in the Southeast region.
Vol. 1 No. 4 Issue Date: November 2016

Table of Contents

Strategies for Reducing Ammonia in Horse Barns

Dr. Carissa Wickens[1] – cwickens@ufl.edu, Dr. Jessie Weir[1], Dr. Hong Li[2]
[1]University of Florida, [2]University of Delaware

Manure is defined as the combination of feces and urine (EPA, 2003). An average 1,000 pound horse produces about 30 lbs of feces and 18 lbs of urine daily (Lawrence et al, 2003). The nutrients in manure are generated primarily from the nutrients in the diet because animals are not 100% efficient at digesting and extracting nutrients from the feeds they consume. Thus, undigested nutrients pass through the digestive system and are excreted in the feces. Dietary intake of nitrogen (i.e. nitrogen from protein and amino acids) is positively correlated with the excretion of nitrogen (N) in manure (Lawrence et al., 2003).

Ammonia (NH_3) is a colorless gas with a strong, odorous smell, produced as a by-product of microbial decomposition of organic nitrogen compounds in manure. It comes from urea, a nitrogen containing molecule, which is present in urine and feces. Horses excrete urea in urine to eliminate excess nitrogen, and while urea is odorless and nontoxic, it is rapidly converted to NH_3 by urease, a naturally occurring enzyme in many plants and microorganisms. NH_3 is extremely irritating to the mucous membranes that line the mouth, eyes and respiratory tract. Breathing in NH_3 could cause chronic and acute respiratory disease which is one of the leading causes of wastage in horses used in high performance athletic endeavors and commonly recognized in pleasure horses as well (Hernandez and Hawkins, 2001).

Investigating the effects of housing and bedding type

In a recent pilot study, the authors measured NH_3 concentrations at the ground level in horse stalls as affected by type of housing and bedding material used. Four horses were housed in two different barns (an old style and a new style type horse barn; Figure 1) on shavings or straw as bedding materials, for three days. The old style barn was constructed of concrete floors, smaller, more closed-in stalls with wood walls, and with little engineering to allow for adequate ventilation (e.g., low ceiling and small windows). The new style barn had higher ceilings with a ridge vent on the roof and side vents to increase ventilation, rubber mats as the flooring in stalls, and more open stalls constructed of metal panels with an open, mesh design. The concentration of NH_3 was measured in each stall over three different spots every twelve hours.

When horses were housed on shavings, the NH_3 concentrations were found to be lower on average than when housed on straw. When horses were kept on straw, the NH_3 concentrations near urine spots in the stall were highly variable with some locations exceeding 800 ppm. In contrast, the NH_3 concentration on shavings, while also variable, did not exceed 500 ppm during sampling. While the exact levels of NH_3 that are detrimental to horses are unknown, for humans, the U.S. Occupational Safety and Health Administration (OHSA) has set a 15-minute exposure limit for gaseous NH_3 levels of only 35 ppm (ATSDR, 2004). The data from this preliminary study demonstrates that both horses and their owners could be exposed to very high and unhealthy levels of NH_3 in barns. Thus far, levels of NH_3 on the floor of stalls bedded with straw and shavings appear to be similar across the two barn types. Additional studies are needed to better understand how barn design and ventilation systems affect NH_3 concentrations in horse facilities.

Stall amendments

Horse owners potentially have a multitude of options to help reduce the concentration of NH_3 in the barn. One common misconception is that ground limestone (calcium carbonate) will aid in reducing the amount of gaseous NH_3. Ground limestone has a high pH (alkaline, 9.4) which creates favorable conditions for bacterial enzyme activity, resulting in

Figure 1. Images of an old style barn (left photo) vs. new style barn (right photo) located at the University of

NH_3 formation and volatilization. (Shah, 2006).

Instead of applying lime in stalls, horse owners can use an acidifier amendment (pH less than 7) or an absorber. Acidifiers alter microbial activity, reducing NH3 by facilitating conversion of NH3 to non-volatile ammonium (NH4), thus minimizing horse and human exposure to NH_3 in the barn environment.

Naturally occurring materials like zeolite (a natural clay mineral) tend to reduce NH_3 volatilization by binding or trapping the NH_3. Zeolite is advantageous because it is non-toxic, non-caustic, and moisture-absorbing and can be applied to the stall floor or over urine spots in the bedding. Microbial treatments contain microbes that break down NH_3-forming molecules in feces and urine which decreases the amount of NH_3 produced by the microbes present in fecal material and the environment. Microbe-containing products are also natural, safe, and non-caustic.

Additional strategies for reducing NH_3

While NH_3 cannot be eliminated from horse farms, certain management practices can be implemented to help reduce both horse and human exposure to ammonia. Removing visible urine and wet bedding is the first and most basic step to reducing NH_3 levels in stalls. Make stall cleaning a daily or twice-daily practice. Excess protein from the diet is excreted in urine and contributes to the production of NH_3 in the stalls. Therefore, feeding horses to meet, but not greatly exceed, their daily protein requirement is another way to minimize ammonia. Lastly, horse owners can eliminate urine escape routes. Stall mat seams and gaps create the perfect place for urine to collect/hide. Wood, dirt and clay flooring can become saturated with urine. Use of seamless or locking stall mats can minimize this problem. Straw may be the preferred bedding material for some equine facilities; for example, straw bedding is recommended in foaling stalls to reduce the risk of the foal breathing in or ingesting shavings. Stalls bedded with straw may need to be cleaned more frequently, and application of a stall amendment may help to further reduce NH_3.

Many horses in the southeast region spend a majority of their time outside the stable (e.g. pasture housing), and barns are usually constructed in a more open design (e.g. ample ceiling height to allow air flow above stalls, 5-foot stall walls and/or windows and grills with wider openings to allow greater ventilation between stalls) to help keep horses cooler during periods of high heat and humidity. When possible, keeping horses outdoors will lessen exposure to ammonia and can improve respiratory health. However, there are times when stabling is necessary (e.g. stall rest for injuries, sales preparation or training, or when horses need to come off pastures during drought or flood conditions to minimize damage to pasture grasses). Ammonia levels in the stall, even in stables with open construction can become quite high, therefore strategies to mitigate ammonia in the barn should be implemented.

References

1. Toxic FAQ Sheet for NH3. 2004. Agency for Toxic Substances and Disease Registry (ATSDR). September. www.atsdr.cdc.gov/tfacts126.pdf
2. Shah, S., P. Westerman, and J. Parsons. 2006. Poultry Litter Amendments. North Carolina Cooperative Extension Service. http://www.bae.ncsu.edu/extension/ext-publications/waste/animal/agw-657-poultry-litter-factsheet-l-shah.pdf
3. EPA. 2003. National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs); Final Rule. Federal Register, Wednesday, February 12, 2003. United States Environmental Protection Agency. https://www.gpo.gov/fdsys/pkg/FR-2003-02-12/pdf/03-3074.pdf
4. Hernandez, J., and D.L. Hawkins. 2001. Race-start characteristics and risk of catastrophic musculoskeletal injury in Thoroughbred racehorses. J. Am. Vet. Med. Ass. 218:83-86.
5. Lawrence, L., J.R. Bicudo, and E. Wheeler. 2003. Horse manure characteristics literature and data base review. In: 9th International Symposium on Animal, Agricultural and Food Processing Wastes, Raleigh, NC.

Back to Riding: Tips for Monitoring Your Horse's Fitness

Dr. Jennie Ivey, PhD, PAS-jizvey@utk.edu
University of Tennessee

During the late fall and winter months, many horse owners are not able to ride as often due to weather and shorter daylight hours. During periods of rest or decreased levels of activity horses can lose fitness and conditioning. Keeping track of the horse's fitness can be an important tool to prevent injury and overwork. Before heading out for long trail rides, hacks, or a competitive show, make sure you and your horse are physically prepared.

Equine Fitness and Training

Similar to humans, horses have the ability to increase their tolerance to activity through physiologic adaptation. Just as it would be unreasonable to expect a person to complete a half marathon after taking the winter off from physical activity, it is unfair to ask horses to perform intense workloads without easing back into a normal activity level. Fitness spans multiple body systems and encompasses efficient thermoregulation, cardiovascular and respiratory function along with preventing muscle and skeletal fatigue. A good conditioning program will improve the horse's ability to perform by challenging these systems, or "fitness", and is specific to the type of activity the horse will perform. A horse may be fit for a draft pulling competition, but they would be ill prepared for an endurance race and vice versa.

Training varies slightly from conditioning or fitness, and is defined as the horse learning a new skill or activity. Conditioning and training can be done at the same time, but it is important to understand the difference between each of these activities and their role in equine performance. For example, a runner can work on running form while covering many miles in preparation for a long distance race similar to how a rider can aid the horse to travel in the proper frame while trotting along the rail. Both of these would be good examples of conditioning. If the horse was learning to navigate a trail obstacle, the rider is training a new skill for the horse, but not much conditioning or fitness is being completed during this time.

Both training and conditioning are greatly important for many aspects of equine performance. When developing an exercise program, consider completing activities similar to the environment in which you will expect the horse to compete or perform. For example, horses trained in flat, soft, sandy areas will not be well prepared for hills and hard terrain. If preparing for events requiring bursts of high intensity exercise, such as speed events, cutting, or jumping, be sure to provide the horse time to regain their fitness for these activities as well.

How Much Time is Needed?

In general, horses will maintain their current fitness level for the first three weeks of inactivity. A good rule to follow is for every day off, a horse will require one day of training to regain the lost fitness. After 8 weeks of inactivity, the horse will have lost a substantial amount of fitness and should be reconditioned with low impact time under saddle, such as hacking or flatwork. It is also important to remember that while muscle responds relatively quickly to a conditioning protocol, bones, ligaments and tendons are slower to adapt and need time to adjust in order to avoid injury.

"Take the time it takes" is a phrase often used when training horses to learn new skills, but the concept is easily applied to fitness as well. Allow your horse plenty of time to regain appropriate muscling and for other body systems to adapt to the desired level of activity. Rushing through conditioning and other fitness exercises can lead to sub-optimal performance, injury, and a slow progression for future training sessions.

Monitoring Fitness

The easiest and best way to monitor your horse's fitness is through heart rate recovery after exercise. Begin by taking your horse's resting heart rate while the horse is in a calm, quiet state. The easiest place to take the horse's heart rate is the mandibular artery, just under the jaw. Curl the fingers of your hand in the groove between the horse's jaw, and pull back towards you. A cord-like structure should be felt, and when slight pressure is applied the pulse can be felt. Time the number of pulses to determine how often your horse's heart beats per minute. A mature horse's resting heart rate should range from 28 to 40 beats per minute. If the heart rate is above this range, let the horse relax and try again a few minutes later.

Next, after completing a ride/workout monitor your horse's heart rate back to the normal range. Begin by completing a normal ride/workout/activity and immediately after finishing, take the horse's heart rate. It is important to take this measurement after the peak of exercise intensity, as this will provide the best indicator of the horse's fitness. For example, if completing a reining pattern, take the horse's heart rate immediately after completing the

pattern, but before walking the horse around or out of the ring.

If the horse's heart rate returns to the normal range at or before 15 minutes after exercise has ended, the horse has been worked adequately to maintain fitness considering the current fitness level. This level of activity will allow the horse to maintain its current fitness, but will not increase their overall fitness level. If recovery is achieved within 30 minutes after exercise, the horse has been stressed within an acceptable limit to increase fitness. In the event recovery to the normal heart rate range takes longer than 30 minutes to achieve, the current exercise activity may be too challenging for the horse currently. Consider scaling back the activity/intensity level of exercise and completing conditioning work until the horse has an opportunity to increase fitness level. These tests can be repeated frequently and should be used consistently during any exercise program.

For more information on assessing your horse's fitness or developing a training or conditioning program, contact your local County Extension Agent, or visit UTHorse.com.

Extending Photoperiods with Artificial Lighting

Courteney Holland– cem0022@auburn.edu
Auburn University

Broodmare owners who want to breed their mares before the horse's natural breeding season (April to October in Alabama) and show horse owners who want their horse's haircoat short and shiny for shows early in the year can use an extended photoperiod to accomplish these goals. Extending the natural photoperiod (daylight hours) with artificial lighting can "trick" the horse's body into believing it is spring. Most horses will begin to shed their winter haircoat after 30 to 60 days on an extended photoperiod and most open broodmares will begin to show signs of heat and ovulate after 60 to 90 days.

To extend the photoperiod of horses, owners should put broodmares and show horses under lights during mid November/early December and keep them under lights throughout the winter. The majority of horses exposed to this program will shed their winter coat by February, and broodmares should have a fertile heat cycle before March. Lights in the horse's stall or in a outdoor holding pen should be turned on from approximately 5:00 p.m to 10:00 p.m. daily. This gives the horse a total photoperiod of 15 to 16 hours of light which is the same amount the horse would receive from daylight during the summer. Leaving lights on continuously at night is not as effective as a 16 hour daylength so a light timer is useful in a lighting program. Two footcandles of light provide enough illumination for an artificial lighting program. In a 10 by 10 foot stall, one 200 watt incandescent bulb or two 40 watt florescent bulbs will provide enough light. A general rule is to provide enough illumination to easily read a newspaper in the most dimly lit area of the pen or stall.

Horse owners should remember that horses under an extended photoperiod have little protection against cold weather because they will shed their winter coats. To help these horses stay warm (especially broodmares kept outside), owners should make sure horses have windbreaks, shelters where they can stay dry, and plenty of hay or pasture to help them generate body heat. Under severe cold weather conditions, horses may have to be blanketed to help them maintain their body heat.

Broodmares foaling early in the year (January through March) may enter their normal winter anestrus (the time when they are not having heat cycles) after foaling. If early rebreeding is desired, these mares should be kept under lights through foaling and rebreeding.

Photo Credit– Dr. Courteney Holland

Stallion and Semen Management

Dr. Lew Strickland DVM, MS, DACT– lstrick5@utk.edu
University of Tennessee

Breeding season will be here in a couple of months, so now is the time to make plans for your operation. The two main options for breeding your mare involve natural mating or artificial insemination. Natural mating includes hand breeding and pasture breeding; while artificial insemination includes using fresh, cooled semen or frozen semen. The following tables are designed to be a quick reference regarding the advantages and disadvantages of these common breeding options:

Table 1. Advantages and disadvantages of natural mating:

Advantages	Disadvantages
• Natural breeding process; the mare and stallion know when the time is right to breed • Quick procedure • Easy with good animals and good handlers	• More risk of spreading disease • May need to transport mare to stallion • Increased risk of injury to the mare and stallion

If artificial insemination is preferred, the next choice is whether to use fresh, cooled semen or frozen semen. Fresh, cooled semen and frozen semen share many advantages and disadvantages, but there are some additional disadvantages that must be considered when using frozen semen:

1. Pregnancy rates are generally reduced when using frozen semen.
2. Frozen semen is more likely to cause a persistent mating induced endometritis.
3. Not all stallion semen "freezes" very well; therefore only use frozen semen with acceptable post-thaw semen quality.

Timing of ovulation relative to breeding is even more critical (shorter time window) with frozen semen than with fresh, cooled semen. Breeding within this narrow time frame requires more intense reproductive management with repeated rectal palpations.

However, the main advantage of using frozen semen rather than fresh, cooled semen is the fact that there is no need to coordinate the mare's ovulation with the stallion's collection days. Instead, frozen semen is stored in liquid nitrogen tanks to have available as soon as the mare is ready to ovulate.

Table 2. Advantages and disadvantages of artificial insemination:

Advantages	Disadvantages
• Limits the spread of disease • Reduces the risk of injury to the stallion and mare • Reduces the need to transport your mare • One stallion can breed more mares with a single ejaculate and over an entire breeding season • More people have access to semen from top-performing stallions • Allows evaluation of stallion semen prior to insemination	• More technically complex, which increases the chance for human error • Semen may be lost in transport • Not all breed associations accept this type of breeding • Increased risk of human injury, particularly during the semen collection process

Stallion and Semen Management, continued.

Preparation for Breeding Season

Stallion body condition

Treat stallions as if they are an athlete during breeding season, even if their only job is to cover mares. Feed your stallion to maintain ideal body weight and condition to support the demands of breeding performance. Nutrition has a significant impact on stallion fertility, with energy derived from fat as a significant contributor. Use good nutritional plans and exercise to keep stallions in optimal breeding condition. It is recommended to feed stallions a commercial feed with appropriate levels of amino acids, vitamins, and minerals to maintain ideal body condition during breeding season. Work with your veterinarian and/or an equine nutritionist to design a tailor-made feeding program to keep your stallion in top shape.

Stallion biosecurity

Protect your stallion from infectious disease through farm management practices by implementing pre-breeding vaccination protocols. There are several infectious diseases that can result in an elevation of body temperature. Any body temperature above 102°F can damage sperm cells at all levels of maturity, and it takes up to 60 days for the stallion to produce new, mature sperm cells which is required for return to his former fertility level. Work with your veterinarian to develop a vaccination protocol that is protective against these diseases in your area. Management of your stallion to reduce their risk of contracting fever-causing diseases includes:

Optimizing immunity through vaccination, nutrition, and proper deworming

Limiting exposure to infectious organisms with biosecurity measures such as quarantine periods, frequent monitoring of temperature and vital signs for early disease detection, separate housing, and a diligent hygiene regimen for all handlers in contact with the stallion

Proper health care and management is key to your breeding season and having healthy foals in your pasture. Work closely with your veterinarian and Extension personnel to develop a program that fits your operation.

Working Safely Around Horses

Dr. Clay Cavinder, PhD– cc2944@msstate.edu
Mississippi State University

In the U.S., there are approximately 9.2 million horses which are owned by around 2 million people (AHC, 2005). Many of these horses (the American Quarter Horse Association alone has over 3 million registered horses) are around 1,000 pounds and are very fast and powerful. The size and strength of the horse combined with many people riding and handling them, presents a need for sound advice on how to safely manage and handle horses. A person educated on the potential hazards of working around horses is the first step in being able to limit the amount of risk and potential injury to an individual. We also must understand that risk is involved with almost anything we participate in such as driving a car, riding in an airplane, showing cattle, or playing sports. However, understanding the risk and limitations of our abilities can prevent needless injury.

The following are guidelines for all who participate in horse related activities, whether the person is a beginner or has been working with horses all their lives. Many times, injuries happen to people who feel the most comfortable around horses and momentarily have a lapse in judgment. When working from the ground:

- Leading: always lead horses with your hand firmly around the lead rope close to the halter. In this way, the handler can manipulate the horse's head and keep the horse at a safe distance. Don't lead a horse by the halter alone. Also, when using a lead rope, do not coil the end around the hand (Fig. 1).

- Turning out: many horses tend to run and play when they are turned out, especially if they have been stalled for a period of time. Handlers should always lead horses into an area and turn the horse around so that the horse is facing towards the in-gate and the handler is between the two. In this way, if the horse decides to run and/or kick, they will have to turn 180 degrees around to do so, thus, giving the handler time to move away. Horses who are led into a pen and immediately turned loose can then run by the handler putting them in harms way.

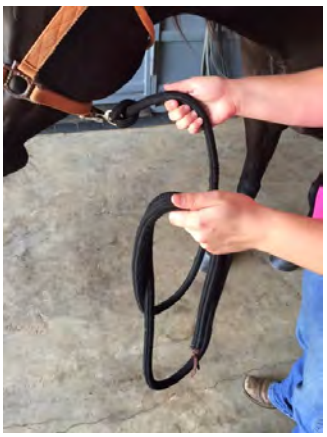

Figure 1. Photo Credit– Dr. Clay Cavinder

Working Safely Around Horses, continued.

- Tying: horses should be tied in a manner that prevents them from getting loose but should also be tied so that a person can quickly untie them in an emergency. Using a quick release knot will ensure both. Additionally, only tie to objects that are sturdy so that if the horse startles and steps back, the object will not come loose (i.e. do not tie to stall fronts, loose panels, flimsy poles, wire fences, etc.). The height and length to which horses are tied is also important. Tie at eye level of the horse and no more than about an arms length of loose rope.

- Grooming: when grooming horses keep your free hand on the horse at all times. If the horse startles and moves into you, this will give you a leverage point to safely push yourself out of the way (Fig. 2). When moving around the horse always talk to the horse to alert them to your location and move around them at a distance that will prevent you from being kicked. When picking up the horses feet, keep your body close to the horse to prevent the horse from kicking you (Fig. 3).

Figure 2. Photo Credit– Dr. Clay Cavinder

- Attire: wearing the proper shoes when leading and handling horses is essential. Never wear open toed shoes, tennis shoes, or other shoes of soft material. Boots with firm leather are a must as horses can quickly and easily step on the foot of the handler on accident or by being startled.

- Feeding: horses who are allowed to come to the feed bucket while the handler is putting the feed in the bucket could inadvertently injure a handler. Requiring horses to stay at a distance until all feed is in its proper place will limit this risk. Also, feeding treats from your hand is not recommended. Horses begin to anticipate these treats and will start to bite at or nibble on people in anticipation of treats.

When riding:

- Tack and equipment: although tack and riding equipment can be pricey, most of the time you get what you pay for. Saddles that not only fit the horse well, but are also made of quality leather are usually more expensive than lower quality made saddles. However, quality leather is less likely to crack or break. Additionally, it is imperative to clean and oil tack and equipment to keep it in its most operative condition.

- Attire: shorts and tennis shoes should never be worn to ride horses. Proper riding attire consists of boots, with a pronounced heel, and jeans. Heeled boots prevent the rider's foot from going through the stirrup and becoming entangled around the rider's ankle. Additionally, jeans prevent injury to the rider's leg. An ASTM certified helmet that fits properly is also a consideration for all riders. Not wearing a helmet or wearing one that fits improperly are factors associated with most head injuries (Watt and Finch, 1996). ASTM/SEI approved helmets have reduced all riding related head injuries by 30% and all severe head injuries by 50% (Nadeau and Greene, 2013).

- Saddling/unsaddling: be aware of cinches or bridles that pinch. Ill-fitting or poorly designed equipment may cause the horse to act in an unbefitting manner. It is recommended that "fresh" horses be tacked up and lunged to allow them to release stored energy. If using a back cinch, the back cinch should be fastened last when putting the saddle on and unfastened first when taking the saddle off.

Figure 2. Photo Credit– Dr. Clay Cavinder

Bridling/unbridling: putting a bit in or taking one out of the mouth of a horse can put a person in a precarious position. The safest way to bridle or unbridle a horse is to stand close to the horses face, next to his throatlatch. Slowly introduce the bit to the horse's mouth and most importantly when taking the bit out, make sure to do it slowly so that the horse drops the bit himself. Yanking the bit out of the mouth may alarm the horse enough that he runs backwards or bumps into the handler. Additionally, always keep your mouth and lips closed while doing this in order to protect your teeth if the horse reacts and potentially bumps the handlers face.

Working Safely Around Horses, continued.

- Mounting: when mounting a horse, the rider should always keep the reins in the left hand. If the horse spooks while getting on, the rider wants to have control of the horse's face. Once mounted, always make your horse stand still for 15-20 seconds before riding off. This will prevent the horse from taking off while being mounted. Lastly, it is imperative that the rider keeps their feet in the stirrups and legs around the horse at all times.

- Paying attention: all handlers, mounted or not, should always stay alert to their surroundings. Watching for loose dogs, children, or debris that could cause the horse to startle are very important. Supervision of riders is important in the prevention of injury. Unsupervised riders may have the greatest risk of injury (Watt and Finch, 1996). This may be especially needed for riders age 10-19 as injuries occur most frequently in this age group (Watt and Finch, 1996)

A rider or handler's confidence and calmness when working around horses is paramount in limiting potential injury as well. People who become frightened can cause the horse to startle worse. Being firm, confident, and smart are all essential aspects of limiting potential injury and maximizing the enjoyment that comes with working with horses.

References
1. American Horse Council. 2005. The economic impact of the horse industry on the United States.
2. Watt, G. M., & Finch, C. F. (1996). Preventing equestrian injuries: Locking the stable door. *Sports Medicine*, 22(3) 187-197.
3. Nadeau, J. and Greene, B. 2013. Helmet fitting guidelines for horse owners. http://articles.extension.org/pages/15658/helmet-fitting-guidelines-for-horse-owners

The Importance of Water Consumption in Horses

Dr. Carissa Wickens– cwickens@ufl.edu
University of Florida

Horse owners are encouraged to pay careful attention to the quantity and quality of water that horses consume during the hot and humid summer months. However, water consumption during the fall and winter months when temperatures are colder, is just as critical to maintaining horse health.

Proper hydration is essential to the horse's fluid balance. Among the most important considerations for meeting the horse's water requirement is water's role in keeping the horse's digestive tract functioning properly. As outside temperatures begin to fluctuate this time of year, sufficient water intake can reduce the risk of impaction colic. The occurrence of colic increases between December and March, mainly because horses do not drink enough water during the winter months (Swinker, 2012). As recommended during other times of the year, water should always be available to ensure the horse's daily maintenance water requirement of 10-12 gallons is met. This means horses housed in stalls should have access to two, 5 gallon buckets. Additionally, a stock tank needs to be large enough to comfortably provide each horse it serves with a minimum of 10 gallons of water.

Providing horses with water that is at the desired temperature can help horses maintain adequate hydration status. Research has demonstrated that horses offered warm water during colder weather consumed significantly more water (as much as a 40% increase in water consumption) than if they were offered only ambient, near freezing water (Kristula and McDonnell, 1994). Heated buckets and stock tank heaters are good options to help keep the water temperature warm in the winter and encourage horses to drink. Remember that stock tank heaters should be plugged into a GFCI protected outlet to protect horses from potential electrical shock. Plug type stock tank heaters are generally safer than the floating style, especially if a plastic tank is used to deliver water to horses.

Photo Credit– Dr. Neely Walker

The Importance of Water Consumption in Horses, continued.

An easy way to warm up stall water buckets is to add a gallon of hot water to the bucket [or tank] water, remembering to always warm both buckets. Further recommendations to help keep horses properly hydrated in winter months include providing free choice salt, and feeding a diet that is largely forage based. High forage diets contain more water than a diet that is mainly grain based. However, harvested forages such as hay are drier than pasture grasses, and therefore adequate water consumption is extremely important during this time of year when horses are being transitioned from a diet consisting primarily of pasture to a hay-based diet. The transition between forage in the diet provided by pasture and forage provided by hay should occur gradually. Changes in the variety or type of hay being fed also need to be made gradually to reduce the risk of digestive disturbances.

Additional Winter Management Tips:

- Make sure horses are in adequate body condition going into the winter.
- Monitor horse body condition regularly. A longer/ and thicker hair coat during the winter months can be mistaken for fat cover. A visual inspection is not enough. Owners should run their hands across the horse's ribs and palpate other parts of the horse's body to make sure they are maintaining condition (for more information on assessing body condition score in horses, see the January 2016 issue of the newsletter).
- Provide horses with plenty of good quality forage. Digesting forage takes longer and actually produces more body heat for a horse than digesting grain which helps horses stay warmer during cold weather. The average 1,000 lb. horse that receives the majority of their ration as hay should be fed about 20 lbs. of hay per day.
- Provide free choice plain white salt. Adding salt or other electrolytes to the horse's water is not recommended, rather, it is best to provide salt in loose or block form and to keep the horse's water fresh.
- If using blankets, check horses regularly to make sure blankets are not creating rubs or sores and remove blankets when day time temperatures rise. Check blankets for proper fit and damage and make any necessary adjustments and repairs immediately. The lower critical temperature for an adult horse acclimated to a mild climate is about 41 degrees Fahrenheit (NRC, 2007).
- Keep your horses as clean and dry as possible to reduce the risk of developing scratches or rain rot.

References:
1. Kristula, M.A. and McDonnell, S.M. Drinking Water Temperature Affects Consumption of Water During Cold Weather in Ponies. Journal of Applied Animal Behavior Science. Volume 41, issues 3-4, August 1994. pp. 155-160.
2. Nutrient Requirements of Horses. Sixth Revised Edition. 2007. The National Academies Press, Washington, D.C.
3. Swinker, A., In Cold Weather Horses Will Reduce Water Consumption and Be At Risk of Colic. Equine News. Pennsylvania State University Cooperative Extension. November 2012.

The Battle Against Rain Rot

Dr. Neely Walker—nwalker@agcenter.lsu.edu

Louisiana State University Agricultural Center

The typical wet weather during winter months creates the perfect conditions to increase the risk for your horse to contract the skin disease commonly known as "rain rot." Rain rot or rain scald (also known as dermatophilosis) is commonly mistaken for a fungal disease, but is actually caused by a bacterial infection. The bacterium *Dermatophilus congolensis* which causes the dry crusty lesions, lives dormant within the horse's skin until the skin is damaged. Rain soaked skin, or skin that is broken, irritated, or damaged by insect bites or trauma is more likely to develop the condition. Heavy winter coats allow excess moisture to stay in contact with the skin causing an anaerobic (lack of oxygen) condition facilitating bacterial growth.

Diagnosis is typically done by visual conformation. Horses with winter coats will develop raised matted tufts of hair along their neck, withers, back, croup, and hindquarters. If not cared for the lesions will continue to grow and combine, creating scabs with yellow-green or gray colored pus underneath them.

The most important step in treating rain rot is to remove the crusty scab like lesions and expose the damaged skin to oxygen. This is usually done by bathing the affected area of skin with some type of antimicrobial shampoo (Betadine, Cholorhexadine, etc.) and gently removing the lesions with a brush or curry comb. In more severe cases, additional layers of skin may be infected and will require systemic antibiotic treatment.

The Battle Against Rain Rot, continued.

Rain rot is extremely contagious. Practicing good hygiene and biosecurity techniques are important to prevent the spread of this infection. Listed below are a few techniques that will help reduce the spread of Rain Rot:

- Groom daily with clean brushes
- Isolate infected horses
- Clean contaminated equipment before using on another animal
- Use an insect spray to reduce skin trauma
- Avoid sharing grooming kits
- Reduce environmental factors when possible (constant wet/humid conditions)

Mild cases of rain rot will usually heal on their own; however it is important to treat all cases to prevent the lesions from spreading and interfering with daily use. If you suspect your horse has a case of rain rot and antimicrobial treatment is ineffective contact your veterinarian.

References
1. Moriello, K. Overview of Dermatophilosis. 2013. The Merck Veterinary Manual.

Photo Credit– Dr. Ann Rashmir

EQUINE EXTENSION

UF IFAS Extension UNIVERSITY of FLORIDA

UGA extension

Sam Houston State University

MISSISSIPPI STATE UNIVERSITY EXTENSION

UK UNIVERSITY OF KENTUCKY College of Agriculture, Food and Environment

NC State University A&T State University COOPERATIVE EXTENSION Empowering People · Providing Solutions

LSU AgCenter Research · Extension · Teaching

UTEXTENSION INSTITUTE OF AGRICULTURE THE UNIVERSITY OF TENNESSEE

TEXAS A&M AGRILIFE EXTENSION

TEXAS A&M UNIVERSITY COMMERCE