



Southern Equine Consortium

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

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Pasture Associated Laminitis

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Good quality pasture provides many necessary nutrients to grazing animals and many horses can handle the transition from consuming winter forages (primarily hay) to quick growing spring pastures easily. Unfortunately, some horses are more sensitive to the amount of starches, sugars and fructans, also known as non-structural carbohydrates (NSC), in lush green pastures and this warrants specific management attention.

Pasture-Associated Laminitis

Equine laminitis is a painful, debilitating disease affecting the laminae within the hoof. The laminae is a soft connective tissue responsible for holding the coffin bone within the hoof capsule securely to the hoof wall (image 1).

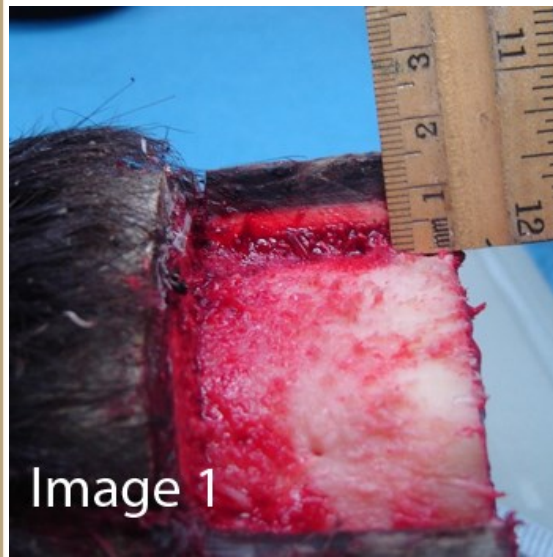


Image 1: The laminae is a soft, connective tissue within the hoof, responsible for holding the coffin bone to the hoof capsule. The laminae can be seen in this image as the dark red line, approximately 0.5 mm wide. (Image credit: Jennie Ivey, The University of Tennessee)

In a horse suffering from laminitis, decreased blood flow to the laminae occurs resulting in inflammation, death of the laminae tissue, and ultimately separation of the coffin bone from the hoof wall. Lack of laminae integrity leads to downward rotation of the coffin bone, and in severe laminitis cases, the coffin bone will rotate through the sole of the horse's hoof. This condition is also known as founder.

While laminitis can be caused by many different scenarios, including repeated concussion on hard ground (road founder), hormone imbalance, and grain overload, lush pasture can cause pasture-associated laminitis or grass founder and be further complicated by obesity and insulin resistance.

Pasture-associated laminitis occurs when horses consume high levels of NSC. While NSC are present in grasses during all growth stages, they are greatest during rapid growth and after times of stress (ex. drought). When horses consume high amounts of NSC, these carbohydrates pass through the small intestine and spillover into the hindgut where they are rapidly fermented. This rapid fermentation causes the cecum to become more acidic and triggers multiple events, ultimately leading to decreased blood flow and nutrient supply to the foot causing laminitis. Additionally, horses that are obese or those suffering from insulin resistance may be more susceptible to pasture-associated laminitis.

Factors Affecting NSC Levels in Grass

Different grass species can result in varying levels of NSC within pasture or hay. Cool season grasses tend to accumulate more NSC in the form of sugars, starches and fructans, where warm season grasses accumulate only sugars and starches. As cool season grasses grow most during the cooler months, concentrations of NSC tend to be higher in these grasses during Spring and Fall months.

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Pasture-Associated Laminitis, continued.

Numerous factors can cause NSC levels in grasses to change from day to day. The time of day can greatly impact NSC content in the grass, with the lowest concentrations from approximately 2AM till 9AM, and peak concentrations in the afternoons. Cooler temperatures below 40 degrees F overnight can also cause higher concentrations of NSC. This is because the plant will not utilize NSC stores overnight, and the NSC will remain in the leaves rather than being used for growth or for energy storage in the root. Sunlight intensity will also cause an increase in NSC, as the sunnier the day, the more photosynthesis occurring in the plant, and thus higher amounts of NSC that are produced. Grasses in mostly shady areas will tend to have lower NSC content when compared to grasses in sunny locations.

Management Tips

Keeping horses healthy and minimizing their risk of pasture-associated laminitis can be achieved through good management techniques. Increasing awareness of the nutrients provided by pastures, dried forages and other diet components is essential in understanding how to keep your horses healthy through the changing seasons.



*Image 2: Keeping horses at an ideal body condition score ranging from 4 to 6 can help prevent incidences of pasture-associated laminitis due to insulin resistance.
(image credit: Jennie Ivey, The University of Tennessee).*

- Aim to keep your horses at a moderate body condition score (BCS, range from 4 to 6, (image 2). Horses with an obese BCS ranging from 7 to 9 tend display a predisposition for laminitis bouts. Reference UT Extension publication SP 782 Equine Welfare Series; The Body Condition Scoring System and SP 795 Equine Welfare Series; Evaluating Your Horse's Weight and Condition for how to assess your horse's BCS and estimate body weight.
- Current research shows NSC content is lowest in the overnight hours and peaks in the late afternoon to early evening hours; therefore, it is best to allow horses to turn out at night and remove from pasture by mid-morning.
- Use a grazing muzzle to limit your horse's intake while out on pasture, especially during the Spring and fall months, when cool season grasses are growing quickly. If possible, limit grazing time or turnout in a dry lot pasture, especially for horses with predispositions to laminitis or with a history of laminitic incidents.

- Have your pasture tested to gain a general understanding of the NSC content in your pastures. Grasses and hay can be tested at a variety of forage testing laboratories. Contact your local Extension Office for information on forage testing. Horses that are insulin resistant or have had issues with laminitis in the past should consume forages that are 10% or less in NSC.
- Generally speaking, as plants mature from the leafy to pre-bud stage, NSC levels decrease and fiber levels increase. The exact nutrient content of forages is dependent on many factors including pasture management, plant species, weather and geographic location. Remove grazing muzzles and increase grazing time gradually to avoid any unintentional overgrazing during this transition period. Typically, in Tennessee this transition can occur anytime between mid-May through early June.
- Use good pasture management including regular mowing and pasture rotation. For more information on nutritional management, forage testing, pasture-associated laminitis or pasture management, contact your local County Extension Office.

Preparations for Foaling

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As we move into the early spring we begin to notice that, little by little, the days are getting longer. Mares bred in the previous spring are beginning to track wider. Anticipation of the upcoming foal crop should prompt you to make necessary preparations. As you develop the management calendar, you will need to work backwards from the EXPECTED FOALING DATE as all other preparations hinge on this point in time.

Calculating Expected Foaling Date (EFD).

Look up your mare's last ovulation date (or last breeding date) and count back 25 days on the calendar. Average gestation length for mares is 340 days so your mare will foal approximately one month earlier than the month you bred her. Gestation length varies a great deal (325 – 360 days). Mares foaling earlier in the year (January - early March) will have, on average, a 10 day longer gestation length than mares foaling later in the year (late March - May).



Late Pregnant Mare
photo credit: Brinkley-Bissenger UF ESC



Body condition score 5 – Moderate
photo credit: Wendy DeVito

Assess

Body Condition Score (BCS)

While lactating, your mares will be in a negative energy balance (burning body fat stores). In anticipation of the expected demands of lactation, assess BCS of your mare and feed her to a minimum score of 5.5 or 6 before foaling. This is best done in the second trimester of pregnancy. If you are unsure of how to evaluate BCS, contact your county agent or check out the app from eXtension:

<http://articles.extension.org/pages/71173/body-condition-scoring-apps-for-horses>

Vaccinate 4 to 6 weeks prior to EFD. There is no transfer of immunity from mare to foal during pregnancy. Foals must consume high quality colostrum within the first 24 hours of life to receive protective antibodies into their bloodstream. Your goal is to boost immunity during the time the mare is producing colostrum in order to enhance colostrum quality at foaling. This is accomplished by vaccinating your mare a month before EFD for all core vaccines and any diseases endemic to your area or farm. Transfer of immunity through colostrum will provide the foal with protection for 4-5 months. Work with your veterinarian to plan the vaccination program appropriate for your area. Note that EHV1 (Rhino) can cause abortions in late pregnancy so EHV1 vaccine should be given during months 5, 7 and 9 of pregnancy. <https://aaep.org/horse-owners/owner-guidelines/owner-vaccination-guidelines>

Deworm with an effective dewormer on the schedule you have worked out with your veterinarian throughout pregnancy and when the mare is showing signs of approaching delivery. Egg shedding in parasites is extremely high during the spring months of foaling. Deworming very close to foaling can prevent threadworms from being passed in the mare's milk and gives the foal a great start. <https://aaep.org/guidelines/parasite-control-guidelines>

Preparations for Foaling continued...

Open Caslick at least 30 days before EFD. This is usually done by your veterinarian. If a Caslick's procedure was done on your mare in the previous breeding season and you fail to open the mare's vulva, the mare will most certainly tear during delivery. Check the vulva frequently after opening because it can heal closed again or become infected.

Check inventory and order supplies that will be needed at foaling and during breeding. If critical need items like frozen colostrum, IgG kits, or tetanus antitoxin are not on hand, they should be readily obtainable. Mares are notorious for delivering when you least expect it.



Caslick's before opening. UF CVM

Signs Your Mare is Ready to Foal

2 Months Prior	Mammary glands enlarge (includes udder and milk veins on her abdomen)
2 Weeks – 2 Hour Prior	Waxed teats, relaxation of the croup muscles and pelvic ligaments (become soft due to hormone release), swelling and elongation of the vulva
Days – Hours Prior	Behavior changes: seek isolation, reduced appetite, signs of discomfort. Teats fill with milk and point outward, udder warm to touch, sometimes “waxing”.



“Waxing” teats Photo credit: S.H. TenBroeck

Care of the Broodmare and Newborn Foal

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Most horse owners who have decided to raise a foal from their mare often miss the actual birth of the foal. The average pregnancy length in the mare is 336 to 340 days, but horses have a wide variation in pregnancy lengths (normal foals have been produced from pregnancies as short as 305 days and as long as 400 days), making it difficult for the horse owner to predict the actual date of birth. Also, most mares foal during the night or very early morning, making the birth difficult for the average horse owner to monitor. Fortunately, mares seldom experience foaling difficulties and usually require no assistance during foaling.

However, there are several steps the owner should take after the foal is born to assure the health of the mare and foal.

Care of the Foal

If you are present during the birth of the foal, the first step after the delivery is to make sure the foal is breathing. Quietly approach the foaling area and remove the birth sack (amnion) from the foal's head. If the foal is breathing, your job is complete and you should leave the foaling area and observe the mare and foal from a distance. This allows the mare and foal time alone to recover from the delivery and bond to each other socially. If the foal does not begin breathing on its own, tickle its nostril with a piece of grass or straw or blow into the foal's mouth to stimulate the respiratory reflex. If the foal still does not breathe, try rubbing the foal vigorously, squeezing its ribs or lifting it about one foot off the ground and dropping it. These procedures usually shock the foal slightly and initiate respiration.

A normal, healthy foal lifts its head and neck and rolls onto its chest within several seconds after delivery. Then the foal begins to make creeping movements away from its dam. If the mare has not stood up yet, the foal's movements usually break the naval (umbilical) cord. You should wait for either the mare or foal to break the umbilical cord. **Do not** cut the umbilical cord immediately after birth, because it is thought the foal receives blood from the placenta after birth. Cutting the cord before this blood transfer may result in circulatory problems in the foal. Foals with circulatory problems typically seem dumb and may have convulsions, leading to the common terms of "dummy" or "wanderer" foals for this condition.

Once the umbilical cord breaks, the stump should be dipped in a mild, 1 to 2 percent iodine solution. The iodine dries the umbilical stump and prevents bacteria from traveling up the stump and entering the foal's body. Bacteria that enter the foal through the umbilical stump cause a systemic infection known by various names, such as shigellosis, naval ill, joint ill, or polyarthritis. This infection causes severe illness or death in foals and causes swelling and deformities in the foal's joints.

You should examine the naval stump for several days after birth to make sure that it remains dry. Urine dripping from the stump indicates that the fetal urine passage from the bladder to the umbilical (the urachus) has not closed. Normally the urachus closes at birth. If it fails to close, in a condition called "persistent urachus," the foal should be treated by a veterinarian.

Usually, foals stand within 1 hour after birth. During the first standing attempts, the foal is unsteady and constantly shifting its head, neck, and feet in an attempt to remain balanced. This unsteadiness is normal, and you should let the foal stand by itself. Lifting the foal onto its feet before its legs are strong enough to support it may strain tendons and ligaments, and it interferes with the bonding process between the mare and foal.

Nursing

When it stands, the foal should begin nursing attempts. The foal instinctively searches at the junction of the mare's legs (both front and back) and body for the udder. The exploratory process involved with finding the udder is normal, and, again, you should resist the desire to "help" the foal. Human interference during initial nursing attempts actually may slow the foal's progress in finding the udder, and it interferes with the mare-foal bond. However, if the foal has not nursed by 2 hours after birth or if the mare aggressively rejects the foal's attempts to nurse, then it is time to interfere. Help the foal stand up and gently guide it to the mare's udder. Hand milk a few drops of colostrum (the mare's first milk) from the mare and coat your fingers and the mare's teats with it. Get the foal to suck your finger coated with colostrum and gradually move your finger beside the mare's teat. Then, slowly pull your finger out of the foal's mouth so the foal will switch to the teat. This procedure may have to be repeated several times before the foal makes the switch to the teat.

Care of the Broodmare and Newborn Foal, continued...

Occasionally a young mare or a mare with a swollen, sensitive udder will have to be restrained for several nursing sessions before she willingly lets the foal nurse. If the mare does not accept the foal after a few nursing bouts, you should call your veterinarian to tranquilize the mare. Keeping the mare tranquilized for a day or two solves most foal rejection problems. Remember to use extreme caution whenever you are working with a foal.

Normally gentle, well-mannered mares can become very protective and aggressive if they think you are threatening their foal.

Colostrum. It is important for the foal to receive colostrum soon after birth because it contains antibodies needed for disease protection during the first few months of the foal's life. These antibodies can be absorbed by the foal's intestinal tract for up to 36 hours after birth, but absorptive ability begins decreasing drastically at 12 hours after birth. Therefore it is important that the foal receive colostrum before this time has passed.

Your veterinarian can perform a simple test to determine if the foal has received adequate protection from colostrum. This test should be done about 6 hours after birth. This gives you an opportunity to correct potential deficiencies in immunity during the time the foal can absorb antibodies from its intestinal tract.

To ensure that the mare has high amounts of antibodies in her colostrum, vaccinate her approximately 30 days before foaling. If you miss this vaccination time, make sure the foal is protected against tetanus by giving it a tetanus antitoxin injection at birth. The tetanus antitoxin is less efficient than immunity from colostrum because it protects the foal for only 2 to 3 weeks while its umbilical stump heals. Because the foal's immune system is not mature enough to use a tetanus toxoid vaccination until it is 3 to 5 months old, the foal is unprotected for 2½ to 3 months if it does not receive protection from the colostrum.

Colostrum has a laxative effect on the foal, which helps it pass the fetal excrement (meconium). Most foals pass the meconium within 4 hours after birth. If the meconium is not passed, the foal can become constipated. A constipated foal frequently stops moving, squats, and raises its tail trying to defecate. Constipation can be relieved easily by giving the foal a warm, soapy water enema (1 to 2 cups) or a prepackaged human mineral oil enema. You should observe the foal for several days for signs of constipation and correct any problems.

Foal Health Problems

Diarrhea in the newborn foal is not common and may indicate a serious illness in the foal. A squirting type of diarrhea can result in dehydration and death of a newborn foal in a few hours.

Immediately consult your veterinarian if your newborn foal develops diarrhea. However, mild diarrhea is common in older foals (1 to 2 weeks of age). This diarrhea often occurs during the mare's foal heat (a fertile heat beginning approximately 7 to 9 days after foaling) and is commonly termed "foal heat scours." In the past, horse breeders thought hormonal changes in the mare's milk during foal heat caused diarrhea in the foal. Recent research has implicated an internal parasite (*Strongyloides westeri*) as the true cause of foal heat scours. This parasite is transmitted from the dam to the foal through the mammary gland. Foals begin to shed eggs in their feces 10 to 14 days after birth, resulting in scours that coincidentally occur with foal heat in the mare. If the foal is alert and nursing regularly, mild foal heat scours usually do not harm it. However if the foal stops nursing and becomes weak or dehydrated, consult your veterinarian immediately. You should keep the scoured areas around the foal's buttocks clean to prevent scalding of the skin. Wash the area with mild soap and water and coat it with petroleum jelly to prevent scalding.

Many foals have limb weaknesses or angular deformities at birth. These include knuckling over at the fetlock joint, weak pasterns in which the back of the fetlock touches the ground, knock knees, and crooked legs. Many of these conditions correct themselves with exercise. If your foal is born with less than straight legs, your veterinarian can assess the situation and recommend a treatment.

Some foals may be born with hernias (defects in the body wall that allow part of the intestines to protrude under the skin). Hernias occur most frequently at the naval and scrotal areas. Small hernias often correct themselves with time, and larger hernias may require surgical correction. Again, this is a situation that your veterinarian should assess and treat.

Occasionally the newborn foal's eyelids and lashes are turned in toward the eye rather than turned out as normal. This is a condition called "entropion" and causes tearing and irritation of the eye. If your foal has entropion, gently roll the eyelid out and consult your veterinarian for the proper eye ointment or treatment that you can perform.

Another infrequent problem in newborn foals is caused by an incompatibility between blood groups of the mare and foal. This condition is known as "neonatal isoerythrolysis" or "jaundice foal." Antibodies to the foal's red blood cells are formed by the mare and secreted in her colostrum. When the foal nurses and absorbs these antibodies, its red blood cells are destroyed. Without prompt veterinary treatment, the foal becomes anemic and dies.

Care of the Broodmare and Newborn Foal, continued...

If you suspect neonatal isoerythrolysis, prevent the foal from consuming colostrum until you can get a veterinarian to test for the condition.

Care of the Mare

After foaling, allow the mare to lie quietly as long as possible. This allows the mare a rest period after birth and prevents premature breaking of the umbilical cord. Most mares will stand within 15 minutes after birth. After standing, the mare begins licking the foal vigorously. The mare is attracted to the birth fluids on the foal and she bonds to the foal when licking off these fluids. You should not interrupt the mare or dry the foal (unless it is cold enough to threaten the foal's health), because it might interfere with the bonding process.

Most mares expel the afterbirth within 1 hour after delivery. If the afterbirth has not been expelled after 3 hours, get your veterinarian to treat the mare. Retained afterbirths can cause colic, founder (laminitis), or septicemia in the mare. You should never pull on the afterbirth, because this can tear it and leave small pieces in the mare.

Never cut off the expelled portion of the afterbirth or tie it up to the mare's tail, because its weight helps gradually to pull it away from the mare's uterus. If the mare is bothered by the afterbirth swinging around her hind legs, tie the afterbirth in a ball with a piece of twine until she delivers it.

Spread the afterbirth on the ground after delivery and examine it carefully to make sure no small pieces have been retained. A normal afterbirth consists of a large sack (allantochorion) that is a shiny grey-white color on the outside and a velvety red color in the inside, a sack that immediately surrounds the foal (amnion), and the remains of the umbilical cord. Piece together any broken pieces to make sure the complete afterbirth was expelled. Then, weigh the afterbirth. A normal afterbirth should weigh about 11 percent of the foal's birth weight (about 10 to 14 pounds for most riding horse breeds). A heavy placenta (around 20 pounds) or one that is bloody in appearance may indicate a uterine infection, and the mare should be checked by your veterinarian.

Check the mare for several days after the delivery for any signs of reproductive tract infections. A slight, watery, blood-tinged discharge is fairly common, but a thick, whitish discharge usually indicates a problem that may require veterinary care.

Care of Orphan Foals

Orphan foals can result from death of the mare, inability of the mare to produce milk, or maternal rejection of the foal. Orphan foals can be raised successfully with some extra care. As with mothered foals, you should make sure the orphan receives colostrum soon after birth. If the foal cannot receive its mother's colostrum, try to locate frozen colostrum (large breeding farms and your veterinarian are good sources). Thaw the frozen colostrum at room temperature. Microwaving or heating the colostrum can destroy the protective antibodies in it. In the absence of any colostrum, your veterinarian can give the foal a plasma transfusion or an oral colostrum replacer to get antibodies into its system.

The best and easiest solution for an orphan is to transfer it to a nurse mare. To transfer the foal, disguise its odor by rubbing whiskey, linseed oil, the foster mother's milk, urine or feces, or any other liquid with a strong odor on the foal. Rub the same odor around the mare's nose. The nurse mare usually must be restrained or tranquilized for several days until she willingly lets the orphan nurse. Another solution is to let the foal nurse a milk goat. This is a good temporary solution, but most goats cannot produce enough milk daily to meet an older foal's nutritional needs. You will need an elevated area for the goat to stand on during nursing (a few bales of hay make a good temporary platform), and you should pad the goat's horns to prevent it from hurting the foal. If these options do not work you will have to bottle-feed or bucket-feed the foal with a mare's milk replacer. There are several recipes for mare's milk replacer; however, the commercially available formulas are nutritionally balanced for the foal and easy to mix and use. Whenever possible, teach the foal to drink from a bucket. This will save you many hours of lost sleep and time away from work. To teach the foal to drink from a bucket, coat your finger with milk and allow the foal to suck your finger. Gradually immerse your finger in the bucket of milk. Waiting several hours between feedings so the foal is hungry often speeds up the learning process. If the foal does have to be bottle-fed, hold the bottle at the approximate height of a mare's udder so that the foal nurses in a natural position. If possible, use a bottle holder so that the foal does not assume you are its mother. You want the foal to learn it is a horse and to respect humans. You should quickly and consistently discipline the foal for inappropriate behavior (biting, kicking, shoving, rearing) directed toward you. Orphans that are bucket-fed or bottle-fed and those nursing a milk goat should be introduced to other horses as soon as possible so they will develop normal equine social behavior. Putting an old, quiet mare or gelding in the pen or stall next to the orphan promotes normal social behavior. If your older horse can be trusted not to hurt the foal, turn them out together as soon as possible.

Care of the Broodmare and Newborn Foal, continued...

A healthy foal nurses from its mother up to seven times an hour for 60 to 90 seconds each time. A newborn orphan should be fed at least every 1 to 2 hours during their first week of life. Free-choice milk intake is recommended for healthy foals. During the first 2 days of life, a foal should drink about 10 to 15 percent of its body weight daily. For the next 5 days the foal's intake should increase to 25 percent of its body weight daily. When either bottle-feeding or bucket feeding foals, make sure that your feeding equipment is clean and that milk does not sour between feedings. Orphan foals always should have access to water and salt. Orphans should be offered grain, milk replacer pellets, and hay after a few days of life. However, the foal may not consume much solid food until it is about 1 month old.

A New Foal Checklist

Several simple post-foaling management practices will help ensure the health of your mare and foal. A checklist follows.

- ◆ Make sure the foal is breathing.
- ◆ Put iodine on the foal's umbilical stump.
- ◆ Make sure the foal (including orphan foals) receives colostrum soon after birth.
- ◆ Make sure the foal is protected against tetanus, either through the colostrum or by a tetanus antitoxin injection.
- ◆ Make sure the foal passes the meconium and treat constipation or diarrhea promptly.
- ◆ Check the umbilical stump for several days for the presence of urine.
- ◆ Check that the foal's eyelids and lashes are turned outward.
- ◆ Follow your veterinarian's advice about any limb deformities and hernias.
- ◆ Make sure the mare expels the afterbirth and check it for completeness.
- ◆ Check the mare for several days after foaling for any sign of reproductive tract infection.

To horse owners unfamiliar with raising foals, this post-foaling checklist may seem like a large amount of work. However, it only takes a few minutes to perform these management procedures, and then you can relax and enjoy your new foal knowing that you have done your best to ensure its well-being.

Preparing Stallions for the Breeding Season

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A breeding soundness exam is a useful tool that stallion owners and managers can use to evaluate the reproductive status of their stallion. The objective of a breeding soundness exam (BSE) is to determine if a stallion has the mental and physical ability to produce viable offspring without spreading infectious disease. While this type of evaluation is critical to determine the number of mares a stallion can successfully cover in a given year, most often this step is overlooked until there is a problem. While the specifics of a BSE may vary between veterinarians, each evaluation should include:

- Reproductive History - needs to be complete in order to avoid inaccuracies. The following information should be collected; age, present numbers of mares covered including their pregnancy rate, foaling rate, or infection. Data from previous evaluations, lameness, illness, fertility issues, current medications, health status, and intended method of breeding.
- Physical Exam - while a breeding soundness exam mainly focuses on the reproductive health of stallions, the general health of the animal should not be overlooked. It is important to positively identify the stallion to prevent legal complications, then focus on the body condition score of the animal. Attention should be paid to any abnormality (physical or genetic) that may inhibit the animal's ability to mate successfully without passing on negative heritable conditions, including lameness or back pain.
- Reproductive Genitalia Exam - an evaluation on the reproductive anatomy is also important. The stallion's penis, sheath, testes and epididymis should be anatomically correct, functional and free from injury or disease. Size, shape and consistency of the testes and epididymis should be noted. A veterinarian may choose to use a set of calipers or an ultrasound to determine the overall volume of each testicle, which is a valuable measurement that helps determine the stallion's daily sperm output.

Preparing Stallions for the Breeding Season, continued...

- **Sexual Behavior** - some stallions may have an aversion to displaying natural breeding behavior based on previous training. For example, stallions that are used as performance animals and show are expected to behave and not display breeding behavior. The training used to teach them to control this natural behavior may create difficulties in the breeding shed. During a breeding soundness exam, a stallion should have immediate interest and interaction with a mare in heat, should obtain an erection within 2 minutes, display a readiness to mount within 5-10 seconds following erection, and should ejaculate on first mount. The total breeding time should not take longer than 5 minutes. A young stallion or a one who does not display normal breeding behavior may need additional training by an experienced handler.
- **Semen Evaluation** - specialized equipment is used to evaluate the volume, concentration, motility and morphology of a semen sample. The color and consistency of the sample along with contents such as debris, urine, or blood. This evaluation determines the number of viable sperm cells available which indicates the number of mares a stallion can breed per collection. In special circumstances additional testing to rule out any reproductive dysfunction may be needed.

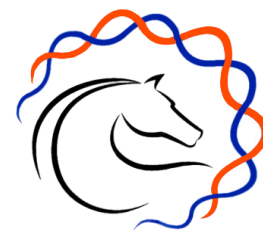
Does Your Horse Have Trouble SWEATING?

Dr. Samantha Brooks and Laura Patterson Rosa

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Anhidrosis is a disease characterized by the inability to sweat. Symptoms can vary in severity and be seasonal or situational. In horses, anhidrosis can lead to hyperthermia, multiple organ failure and, in some cases, death. Treatments for anhidrosis are limited, and do not address the cause of the condition.

Did you know that if your horse has a relative with anhidrosis his odds of having this disease are 22 times higher than average? UF, in partnership with LSU, is conducting a study to investigate genetic components to this disease. If you have a horse with anhidrosis we need your help! Participation in the study requires a short online survey and a hair sample from your horse. If you would like to participate, please submit samples and survey responses by May 15. Our thanks to the American Quarter Horse Foundation for supporting this study!



UF Equine Genetics

HOW TO PARTICIPATE: Visit www.ufequinegenetics.org/anhidrosisv2.html for instructions or to enroll. Contact us at (352) 273-8080 or email equinegenetics@ifas.ufl.edu for more information about the study.

