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## Breeding Soundness Exams for Stallions

**W**ith breeding season fast approaching, stallions should undergo breeding soundness exams before starting to breed mares, whether via artificial insemination (AI) or live cover.

Overall health is critical to a stallion's reproductive success; thus, he should be in good physical

condition and not overweight at the start of the breeding season. Stallions carrying too much extra weight might show decreased sperm quality. Like all horses, they need exercise to maintain mental sharpness and a healthy body condition.

"It's not good for the stallion to be fat," said Ed Squires, PhD, Dipl. ACT (hon.), director of UK Ag Equine Programs and executive director of the UK Gluck Equine Research Foundation. "The problem ... is that fat in the scrotum insulates the testicles, which increases the temperature, which in turn affects sperm production and quality."

Squires pointed out that in the Thoroughbred industry, stallions are rarely fat. They generally are turned out in a paddock, able to exercise freely, or they are in a sophisticated exercise program. But in the show horse industry,

more stallions are overweight. Part of this is management: The non-Thoroughbred world doesn't always have access to the same type of housing and turnout as the Thoroughbred industry does; they instead rely on alternatives such as hot walkers and hand walking.

With AI, semen should be collected several days in a row to stabilize sperm output collection. Then a reproductive specialist should conduct a breeding soundness exam on the horse.

### ARTICLES OF INTEREST

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ANNE M. EBERHARDT

Have a reproductive specialist conduct a breeding soundness exam.

## (BREEDING SOUNDNESS ...)

“It’s important to look at semen, usually by January, to assess the horse’s semen parameters going into the breeding season,” Squires recommended. “Breeding soundness is an indication of where the horse is in terms of quality and sperm production, and those factors will determine how many mares he can handle. Additionally, once the stallion reaches his ‘teenage’ years, it’s important to check sperm regularly so you have a baseline for his sperm count and quality in case changes occur dramatically.”

A breeding soundness exam measures:

**Motility.** Progressive motility, or sperm “quality,” measures how many sperm move in a straight line across a field. Sixty to 70% of the sperm should be progressively motile, with less than 50% indicating a problem.

**“It’s important to look at semen, usually by January, to assess the horse’s semen parameters going into the breeding season.”**

**Dr. Ed Squires**

### **Total number of sperm in the ejaculate.**

This amount will vary according to testicle size, season, and age of the horse. Look for sperm count in the 10 to 20 billion per ejaculate range. For a breeding evaluation, two collections can be taken one hour apart. The second ejaculate should have half the sperm as the first.

**Testicle size.** Testicles can be measured either using ultrasound to measure volume or plastic calipers to measure width. This should be done

several times a year to measure/monitor relative changes in size.

**Bacterial shedding.** A horse can be physically healthy and still shed bacteria, so take swabs from the urethra, semen, and prepuce for bacterial cultures.

**Morphology.** Generally more than 50% of the sperm should be morphologically normal.

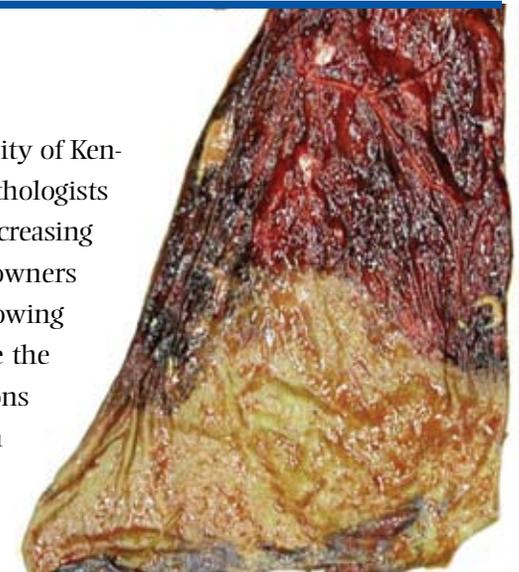
According to Squires, a breeding soundness exam before the season begins helps owners determine how many mares the stallion can likely handle. It will answer the following questions: Is the stallion fit, not fat? Has he changed from the previous year? Is his semen healthy in terms of sperm count morphology and motility? **UK**

*Karin Pekarchik is an editorial officer in UK’s Agricultural Communications Services.*

## Nocardioform Placentitis Affecting the 2011 Foal Crop

In November and December of 2010, the number of nocardioform placentitis cases submitted to the University of Kentucky Veterinary Diagnostic Laboratory (UKVDL) increased markedly. This increase was observed both by pathologists and through the use of a diagnostic surveillance tool monitored by the university’s epidemiology section. The increasing incidence of nocardioform placentitis continued into 2011, causing growing concern among practitioners, farm owners and managers, the University of Kentucky Department of Veterinary Science, and the horse industry media. Following several meetings with equine industry stakeholders, an ad hoc task force was assembled to further investigate the unusual number of cases. Full participation by the equine industry, including subsidies for placental examinations by local organizations, led to the largest number of nocardioform placentitis submissions on record—more than 325 laboratory confirmed cases. Of those placentitis cases, 30% resulted in abortions or stillbirths and 70% resulted in a live foal.

Nocardioform placentitis was first identified in Central Kentucky in the mid-1980s. The term “nocardioform” was adopted due to similarities of the causative agents to the broad category of bacterial organisms called



**A placenta with signs of placentitis**

## (NOCARDIOFORM PLACENTITIS ... )

nocardioform actinomycetes. Through sequence analysis of 16S rRNA genes, the most common organisms have been identified as *Crossiella equi* sp., *Amycolatopsis* spp., and *Streptomyces* spp. The clinical ramifications of nocardioform placentitis range from late gestation abortions, stillbirths, and prematurity to small and weak foals that may or may not survive. Due to the fact that even mild cases of nocardioform placentitis were submitted in 2011, a number of foals were healthy and vigorous at birth even though the placenta was affected with nocardioform placentitis.

Nocardioform placentitis lesions are distinctive, and the cervical star region is spared. Lesions most commonly occur in the body of the placenta at the bifurcation of the horns. Most typical cases of bacterial (noncardioform) placentitis are ascending and begin in the cervical star region. Lesions might be single or multiple. The affected chorion (outer placental membrane) is covered by a thick, light brown, tenacious exudate, described by some as resembling peanut butter, that overlays a rough, tan chorion with marked loss of villi (small, vascular projections). Loss of chorionic villi compromises fetal nutrition severely, leading to the characteristic emaciated appearance of most aborted fetuses. The bacteria do not cross from the fetal membranes to the fetus, another unusual feature.

Previous theories about nocardioform placentitis have been largely limited to anecdotal observations. Common theories are that nocardioform placentitis occurs following a dry fall season and

that mares are affected sporadically, without any one farm having a greater number of cases in proportion to the number of mares. Nocardioform

placentitis has been documented in Florida, New York, South Africa, and Italy as well as Kentucky. Researchers hope significant inroads can be

## WEED OF THE MONTH

**Common name:** White Snakeroot  
**Scientific name:** *Ageratina altissima* (L.) King & H.E. Robins  
**Synonym:** *Eupatorium rugosum* Houttuyn  
**Life Cycle:** Perennial  
**Origin:** North America  
**Poisonous:** Yes



**White Snakeroot**

White snakeroot is a warm-season perennial found frequently in shaded areas of pastures near streams or woods.

It reaches a height of four to five feet. Leaves grow opposite each other, characterized by three main veins and serrated margins. At maturity, white flowers bloom in flat-topped or domed panicles (branched clusters). White snakeroot emerges in late spring and is often not identified until flowers develop in late summer or early fall.

White snakeroot plants are toxic to horses; both fresh and dried leaves contain the toxin. Cumulative intake between 1 and 10% of body weight is toxic and can be lethal. Clinical signs of white snakeroot poisoning in horses include depression, weakness, tremors, or congestive heart failure. Signs of poisoning generally occur within three to 14 days. The toxin also is readily passed in milk and might poison nursing animals.

Look for white snakeroot in moist, shady areas along pasture margins. Removing these plants from pastures by hand is often the best course of action, but ensure horses cannot access dried plant material after removing. Consult your local Cooperative Extension Service personnel ([www.csrees.usda.gov/Extension](http://www.csrees.usda.gov/Extension)) for specific identification and control methods in your area. **UK**

*William W. Witt, PhD, a researcher in the department of Plant and Soil Science at the University of Kentucky, provided this information.*

(NOCARDIOFORM PLACENTITIS ... )

made in the understanding of this unusual disease process through the tremendous number of cases received and with the collaboration of practitioners, owners, the UKVDL, and the University of Kentucky Gluck Equine Research Center. Currently, studies are in progress to better understand this condition, the route of infection, early diagnosis, and better means of treatment. **UK**

*Laura Kennedy, DVM, Dipl. ACVP, is a pathologist at the University of Kentucky Veterinary Diagnostic Laboratory. Contact her at 859/257-8283 or [dlaurakennedy@uky.edu](mailto:dlaurakennedy@uky.edu). Reprinted from the Equine Disease Quarterly, UK Department of Veterinary Science.*

## CENTRAL KENTUCKY COUNTY AGENTS HOST 'PASTURES PLEASE!' WORKSHOP

University of Kentucky (UK) Cooperative Extension Service agents in Bourbon, Clark, Fayette, Jefferson, Jessamine, Scott, and Woodford counties are teaming up with UK Ag Equine Programs to host their annual "Pastures Please!" meeting for horse owners and farm managers interested in the latest pasture management information. The event will be held Jan. 31 at 6 p.m. at the Clark County Extension Office at 1400 Fortune Drive in Winchester. The meeting is free to the public, and light refreshments will be served.

"We are pleased to offer our upcoming 5th annual equine 'Pastures Please!' program, this year in Clark County," said Ray Smith, PhD, professor and forage extension specialist at UK. "This has been one of the most popular pasture

## UK STUDY ON MUSCLE MASS IN OLDER HORSES UNDER WAY

*Below is an edited excerpt used with permission from a story posted to Morris Animal Foundation's website about a University of Kentucky study by Kristine Urschel, PhD, assistant professor in the Department of Animal and Food Sciences:*

In a Morris Animal Foundation-funded study at the University of Kentucky, principal investigator Urschel is working to understand why old age leads to the loss of muscle mass in horses. Under the guidance of David Horohov, PhD, William Robert Mills chair and professor at the Gluck Center, Urschel's research could provide support for aging horses in several ways.

"This research could help extend the life expectancy of older horses and also help owners and stakeholders to better care for their aging equines," Urschel said.

The team's research focuses on how other age-related and geriatric diseases might affect protein metabolism. Specifically, the study is first testing to see how levels of inflammation common in older horses are related to protein synthesis. Second, the study is looking at how the age-related disease known as equine Cushing's disease might also affect protein synthesis.

Although the study is still a year from completion, results look promising. Many of the techniques being used in this study have been applied extensively in human studies, but never before with horses. Moreover, the study is examining how protein synthesis is affected by age-related factors at the whole body, muscular, and molecular levels. As a result, new treatments based on significant findings in this study can be applied in various ways, including the development of dietary strategies and disease-specific treatments.

To see the complete story, please visit [www.morrisanimalfoundation.org/blog/category/horse/unraveling-the-mysteries-of.html](http://www.morrisanimalfoundation.org/blog/category/horse/unraveling-the-mysteries-of.html). **UK**

*Content provided by Alex Jimenez, Communications Coordinator at Morris Animal Foundation.*

management programs the Extension Service and College of Agriculture hold each winter. Attendees will hear important management practices they can use to improve their horse pastures. This year's program will focus on practical advice on pasture weed control, reducing parasite loads, and when to fertilize horse pastures in Kentucky."

Attendees will also receive an update about the 2012 Kentucky Equine Survey.

"This program provides something for every horse owner," said Adam Probst, Woodford County Extension Agent and one of the event's key organizers. "The planning committee each year aims to deliver timely and practical information."

## (PASTURES PLEASE WORKSHOP ... )

“With the current economic situation in the horse industry, it is extremely important to find ways to improve the bottom line,” said Ed Squires, PhD, Dipl. ACT (hon.), director of UK Ag Equine Programs and executive director of the UK Gluck Equine Research Foundation. “This may include how to get the most out of your pastures. This seminar is sure to provide great tips for pasture management, weed control, and horse management.”

Those interested in attending should RSVP through their local county extension agent or the Clark County Extension Office at 859/744-4682, as well as contact UK Ag Equine Programs at 859/257-2226.

Pastures Please is sponsored by the UK Cooperative Extension Service and University of Kentucky’s Ag Equine Programs. [UK](#)

*Holly Wiemers, MA, is communications director for UK’s Ag Equine Programs.*

## BROODMARES’ NUTRITIONAL NEEDS DURING LATE GESTATION

The last few months of fetal development see the most growth, tissue accumulation, and weight gain. Thus, late-pregnancy mares need to be fed adequately so they are not undernourished, according to Laurie Lawrence, PhD, professor in the department of animal and food sciences at the University of Kentucky, who, along with research staff and students, oversees a broodmare band of 20 at UK’s Maine Chance Farm.



## STUDENT SPOTLIGHT

To highlight equine research projects by graduate and doctorate students in the University of Kentucky College of Agriculture.

### Stephen Coleman

**From: Edmonton, Alberta, Canada**

**Degrees: BS in Agricultural Biotechnology from UK (2003)**

**MS in Veterinary Science from UK (2006)**

**PhD in Veterinary Science from UK (2011)**

In December 2011 Stephen Coleman completed his PhD in Veterinary Science at the University of Kentucky under the leadership of Jamie MacLeod, VMD, PhD, John S. and Elizabeth A. Knight chair at the Gluck Equine Research Center. “My PhD work has been focused on looking at gene expression in the horse on both a qualitative and quantitative level,” Coleman said. “The data from my project was used to describe 11,356 gene structures, many of which had not previously been experimentally described. I also identified and investigated genes which might be unique to the horse.”

“The data that Stephen generated is being used by equine scientists around the world,” MacLeod said. “He has made major contributions to our understanding of gene structure in the horse.”

Coleman also has been active in the Equine Initiative for several years, serving as chair of a student working group and on the organization’s executive committee. In his role with the student working group Coleman helped identify opportunities for student involvement and provided feedback and advice to program leaders from a student’s perspective. He also helped plan and execute equine events geared toward students as well as the general public. As an executive committee member, he represented a student perspective to the organization’s leadership and helped set the direction of UK’s equine programs.

In the short term Coleman said his plans include working as a postdoctoral scholar with UK’s Veterinary Science Department and finishing up some of the projects he began with MacLeod’s laboratory. Long-term, Coleman said, “I am highly interested in the application of informatic and computational approaches to address biological questions. I would like to continue working with ‘omic’ level (global) approaches in a career investigating the relationships between genotype and phenotype.” [UK](#)

*Holly Wiemers, MA, is communications director for UK Ag Equine Programs.*

## (BROODMARES' NUTRITIONAL NEEDS ...)

Because a mare will rob her body to feed the fetus first, it's important she maintain a healthy weight during pregnancy. When considering her calorie needs, make sure her Henneke body condition (BC) score remains stable. BC scores range from 1 to 9, with 9 being obese and 1 malnourished. In late gestation, aim for a score between 5 and 6.

"It's not an issue if she's a slightly higher score, but a lower score can compromise a mare's ability to get rebred," Lawrence cautioned. "With an appropriate body condition, you can't see the ribs but you can feel them, and there is a fat cover over the topline. The mare will appear pleasingly plump.

"It's important that mares receive adequate feed to fuel fetal growth," Lawrence continued. "To accomplish it, they can use a combination of body stores and diet. Ideally, a mare will get

sufficient feed and use the nutrients from her diet to supply the fetus's needs. That way she retains her own body stores for herself."

Lawrence points out that in late gestation, a mare's voluntary feed intake often does not increase with her body's needs. Thus, owners should feed mares higher amounts of grain at more frequent intervals because the mare might not be able to manage large amounts of feed as the foal fills her belly. She instead needs to nibble throughout the day to meet her nutritional requirements.

Feed quality is also very important and determines what mix a mare is fed. Lawrence recommended each mare be evaluated individually.

"Professionals will look at a mare every day and make a judgment about her condition, adjusting feed up or down, as she needs it. That might not be necessary for everyone, but a weekly check should be routine," she said.

As mentioned, owners should feed enough grain to maintain the mare's body condition. The amount fed depends on the protein percentage of both the grain and forage used. If it's more than four pounds, divide it into multiple feedings. Keep in mind that if you overfeed protein, mares will excrete the excess.

Choose a concentrate designed for broodmares that contains an appropriate percentage of protein and mineral content. Adjust the amount of concentrate fed according to the amount and type of hay fed. For instance, if you feed timothy hay, the mare will need a higher protein concentrate. If you feed alfalfa, which has a high protein content of 16 to 18%, the mare can have a lower protein feed. If a mare is maintaining body condition on forage alone, consider feeding a balancer pellet, which is a concentrated source of minerals. Mares need adequate amounts of copper, zinc, calcium, and phosphorus, as well as other trace minerals, during gestation.

"Have water and a salt block available at all times. Animals will usually regulate their salt intake, but they will not recognize the body's need for trace minerals," Lawrence said. The mare's water intake will increase dramatically as soon as lactation starts.

If horses are fed in a herd, monitor the heavily pregnant mares to see where they fall in the herd's pecking order. They might compete well in the beginning and defend their feed, but as they near term, they might not eat their feed as quickly and more dominant mares might move



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**Because a mare will rob her body to feed the fetus first, it's important she maintain a healthy weight.**

## (BROODMARES' NUTRITIONAL NEEDS ...)

in to finish their portion. BC score these mares regularly to be sure they don't lose ground.

Research shows that both inadequate and excessive feed are detrimental to broodmares. Underweight mares, in particular, have longer gestations. As Lawrence puts it: "If you turn down the oven, it takes longer to bake the cake."

Veterinarians and nutritionists do not recommend a "fat," or high, BC score, but mares do need a buffer for the beginning of lactation.

During pregnancy most mares should consume 2% of their body weight per day (for example, a 1,200 pound horse requires 24 pounds of grain and hay/pasture). After foaling, total feed needs will increase (that same mare would now require 30-35 pounds of total feed) because of the increased demands of lactation. (Plan for variation if feeding moderate- or low-quality hay.)

Lawrence reminds owners to transition the

mare's feed intake gradually as she approaches her foaling date. "Don't increase her feed by dramatic amounts. Do it slowly, over seven to 14 days. Ideally, you'll stay with the same hay, but if you have to change, start seven to 10 days before she foals. She will voluntarily eat more food, but you have to be careful not to upset her GI tract in the days before or after foaling," Lawrence cautioned. **UK**

*Karin Pekarchik is an editorial officer in UK's Agricultural Communications Services.*



## BEING PREPARED FOR WEATHER DISASTERS

In 2010, more than half the United States, from Texas to Maine, was engulfed in a major winter storm. Millions of people were without power, road/highway access, or viable communications. Loss of electricity, impassable roads, and breaks in communications can, however, happen in any climate at any time, due to floods, straightline winds, tornadoes, hurricanes, and other natural disasters. The start of a new year is a good time to review farm disaster plans. Planning will help keep family, employees, and horses safe in the event of a weather disaster.

Human health and safety must come first, so having a family disaster plan should precede preparation of horse facilities. At [www.redcross.org](http://www.redcross.org) you will find a wealth of resources on family disaster preparedness. Information on business disaster planning is available at [www.ready.gov](http://www.ready.gov).

Water and electricity are major considerations



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## (WEATHER DISASTERS ...)

during and after weather disasters. Water is essential to horses' health, especially when they can drink eight to 12 gallons per day. Do not expect a horse to be able to get his required water intake by eating snow, even if there is plenty around. A loss of electricity means no lighting in the barn, but more importantly, power loss can cause several problems regarding horses' water intake. First, without power, you cannot pump well water, which might be horses' only water source. Second, automatic waterers run on electricity, which means that without power you will have to use buckets or water tanks. Third, water pipes can freeze if pipe-heating tape is no longer powered. Finally, to encourage horses to drink more in winter, water should be maintained at 45-65°F, which can be difficult to do without electricity.

Because loss of electricity can cause significant problems for farms at any time of year, it's essential to have a backup generator and know how to run and maintain it properly. Remember, however, that carbon monoxide toxicity from running generators is a very real threat. Fuel is, of course, also required. As farmers in ice-coated western Kentucky learned in 2009, generators do little good after the fuel source (and supply) runs out. Make a plan for storing generator fuel safely, and contact neighbors so you can share resources if need be.

All people on the farm should know how to turn off the water, electricity, and other utilities to buildings in case of burst pipes, power outages, or fire hazards.



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### **Keep temporary fencing materials on hand to repair downed fencing.**

If a frozen pond is in a field where horses are kept, the animals should be moved to another pasture or, if at all possible, moved into a barn. All too often animals will walk onto the frozen ice and snow only to break through and fall into the freezing water; this can be prevented by fencing off ponds prior to winter. Temporary fencing materials should be kept on hand for this use as well as for repairs to downed fencing.

With roads closed due to ice, downed trees, and debris, transportation on and off a farm could be hampered for weeks at a time. If weekly feed deliveries are required, make plans to stockpile at least two weeks of feed in rodent-proof containers on your farm. Several weeks' worth of hay should be kept on hand, and even more in very cold weather areas.

Emergency managers know well that communication capabilities are often the first services to be compromised during and after disasters. Telephone lines and cell towers might be downed during severe weather, or cellular service might be overwhelmed so that calls cannot go through. Having a car charger for a cell phone is a necessity in case power is interrupted. You might need to call on neighbors for assistance, request emergency help, or get veterinary advice by phone for treating a sick horse when roads are closed. Ham radio operators in the area are another means of emergency communication.

Keeping the barn perimeter free of debris is not only tidy but reduces dangerous airborne projectiles in high winds and hidden, frozen tripping hazards to people and animals after winter storms.

For safety tips for standby generators go to [extension.missouri.edu/p/EMW1015](http://extension.missouri.edu/p/EMW1015) and [extension.missouri.edu/p/EMW1016](http://extension.missouri.edu/p/EMW1016).

For questions and answers on carbon monoxide, go to [www.cpsc.gov/cpsc/pub/pubs/466.html](http://www.cpsc.gov/cpsc/pub/pubs/466.html). **UK**

*Roberta Dwyer, DVM, MS, Dipl. ACVPM, is a professor in the Department of Veterinary Science at the University of Kentucky. Contact her at 859/218-1122 or [rmdwyer@uky.edu](mailto:rmdwyer@uky.edu). Melissa Newman, PhD, is an associate professor in the Department of Animal and Food Sciences at the University of Kentucky. Contact her at 859/257-5881 or [Melissa.newman@uky.edu](mailto:Melissa.newman@uky.edu).*

*Reprinted from the Equine Disease Quarterly, UK Department of Veterinary Science.*

## DATES SET FOR 2012 KENA NETWORKING MEETINGS



The dates and topics for the 2012 Kentucky Equine Networking Association (KENA) have been set. KENA is a bimonthly networking dinner hosted by the Kentucky Horse Council in partnership with the University of Kentucky's Ag Equine Programs (formerly the UK Equine Initiative).

KENA provides an educational and social venue for equine professionals and other horse enthusiasts from all disciplines to share ideas and business strategies.

Upcoming dates and topics are:

- March 15, Buyer vs. seller perspective of marketing techniques
- May 17, Common causes of lameness in the horse
- July 19, Equine business vs. hobby: What is the law?
- Sept. 20, Equine acupuncture
- Nov. 29, Considerations for building an equine facility

All meetings are at 6 p.m. at the Clarion Hotel in Lexington except for the March 15 meeting, which will be at the Embassy Suites in Lexington.

For more information, visit [www.kyequinenetwork.org](http://www.kyequinenetwork.org).

*Jenny Blandford is the Gluck Equine Research Foundation Coordinator at the Gluck Center.*

## UPCOMING EVENTS

### Jan. 31, 6 p.m.

Pastures Please, an event focused on hands-on information about horse pasture management organized by the Cooperative Extension Service of Bourbon, Clark, Fayette, Jefferson, Jessamine, Scott, and Woodford counties, will be held at the Clark County Extension Office in Winchester, Ky. Light refreshments will be served.

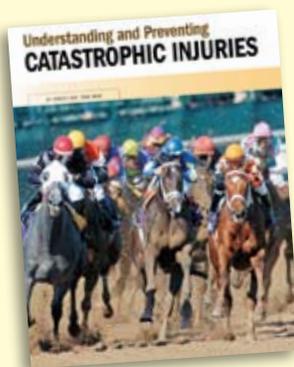
### Feb. 2, 4 p.m.

University of Kentucky Gluck Equine Research Center Equine Reproduction Facilities grand opening, Maine Chance Farm, Lexington, Ky.

### March 15, 6 p.m.

Kentucky Equine Networking Association (KENA) meeting, networking 6 p.m., dinner 6:30 p.m., Embassy Suites, Lexington, Ky.

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