University of Kentucky

Bluegrass Equine DIGEST

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An optimal surface can help contribute to horse and rider safety.

Surface Testing: Keeping Horse and Rider Safety in Mind

PART TWO: EVALUATING ARENA FOOTING

This is the second article in a series looking at the testing and maintenance of equine competition surfaces worldwide.

As we learned last month, no matter the discipline—be it a horse race, show jumping competition, dressage test, reining pattern, or any other equine events—all have one shared requirement: appropriate and safe footing.

Mick Peterson, PhD, is the director of University of Kentucky (UK) Ag Equine Programs, faculty member within UK's Biosystems and Agricultural Engineering Department, and executive director of the Racing Surfaces Testing Laboratory (RSTL). With the RSTL, he has a 10-year history of examining competition surfaces at racetracks and equestrian events worldwide, developing maintenance protocols and standards, and offering recommendations. In this role, he is considered one of the world's premiere experts on testing high-level competition surfaces.

Last month, Peterson discussed racetrack surface testing. Here, he'll share information about testing for arenas used in sport horse competitions, particularly Fédération Equestre Internationale (FEI) event venues.

As with racing surfaces, competition arenas have certain criteria that must be met to ensure optimal footing. Peterson said he evaluates five components during testing:

- Firmness;
- Cushioning;
- Grip;
- Responsiveness; and
- Uniformity.

These parameters impact the horse's limb-loading, as well as performance; how much support and give the surface has; how much the horse's hoof moves during landing, turning, and pushing off; how consistent the surface feels; and the surface's consistency over time. It is also important to factor in the rider's perception of how the arena footing affects the horse's performance when doing arena surface testing.

"Safety and fairness are the goals of arena testing," Peterson said. "The biggest challenge is making sure that the last competitor to go in the ring has the same footing as the first competitor did."

The steps to examining an arena are similar to those used on a racetrack. First, RSTL engineers will review the design and maintenance protocol of the arena(s) at the venue being tested. They will examine arena construction, subsurface materials used, and the venue's layout, along with how the arena was installed.

Then, they perform functional performance testing and compare that data to laboratory performance testing information to ensure the installation

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Surface Testing

ERICA LARSON/THE HORSE

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meets the manufacturer's specifications. These tests allow the researchers to give the venue recommendations about how to better maintain and/or improve its surfaces. During the initial design and the installation, the materials undergo extensive scrutiny, including content analysis for characteristics including footing fiber, sand mineralogy, sand shape, and particle size distribution, as well as being analyzed for permeability, shear strength, sand durability, and water-retention abilities.

After the researchers assess the surface and match it to manufacturer specifications, they begin testing using the Orono Biomechanical Surface Tester (OBST). Because it simulates a horse's hoof impacting the footing, it can be used to quantify the cushioning, responsiveness, impact firmness, and grip that are part of the arena testing criteria. The OBST is either used *in situ* (in the arena) or using the "track-in-a-box," which is a smaller sample of the overall arena collected during the initial design evaluation. The engineers also use other tools, such as moisture and temperature probes, as well as air quality testing, to gather on-site information.

Similar to the racetrack surface testing, the data gathered from arenas helps inform the RSTL staff and venue maintenance personnel about the footing's state. If any tests performed on arena surfaces come back less than optimal, the maintenance team and the laboratory can work together to make improvements. They can also compare a particular surface's current and previous test results and use that information to evaluate the surface's quality over time.

Although the detailed arena surface testing is very technical, its goals are relevant to any equestrian competitor. An optimal surface can help contribute to horse and rider safety and ensure that every competitor, from the very first horse and rider pair to the very last, gets to experience the same high-quality surface so everyone is, quite literally, on equal footing. UK

>Maddie Regis, a junior marketing major, is a communications and student relations intern for UK Ag Equine Programs.

Fertilizing Cool-Season Horse Pastures

Good pasture management begins with maintaining good soil fertility to promote the growth of desirable grasses, such as Kentucky bluegrass, orchardgrass, perennial ryegrass, and novel tall fescue. Now is an excellent time to review your soil fertility records and make plans for grazing this season.

Soil sampling can be conducted throughout most of the year, but early spring and fall are most common times to do so. Sample only the top 4 inches of the pasture, and divide large pastures into "subpastures" for sampling based on the varying topography.

Phosphorus (P), potassium (K), and lime

- P and K promote plant growth and longevity, but plants don't use lime directly. Rather, lime adjusts soil's pH, making other nutrients more available for the plants to use.
- Soil tests can help determine whether you need to apply P, K, or lime (and other nutrients), and applications might not be needed annually. High-traffic areas might not require P or K as it is recycled in animal manure.

Masthead

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The Horse: Your Guide To Equine Health Care

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Cool-Season Horse Pastures

- P, K, and lime can be applied at any time of the year, as long as the weather is cooperative.

Nitrogen applications

- A spring nitrogen application generally isn't needed for cool-season pastures because grass growth is naturally rapid in the spring. But farms with high stocking rates and intensive grazing can benefit from light applications in early spring.
- In the fall, apply nitrogen in two applications (30-60 pounds per acre each time) to prolong fall pasture growth and prepare plants for overwintering. Well-fertilized pastures will survive winter better and will green up sooner in the spring.
- Only fertilize in the summer if harvesting hay or managing warm season grasses, such as bermudagrass. Be sure to apply it on cool days or use nonvolatilizing nitrogen sources such as ammonium nitrate.

While you don't have to restrict grazing access to recently fertilized pastures, it's ideal to give fields a week of rest or a good rain before returning animals to the pasture. For more information, see *Soil Sampling and Nutrient Management* (AGR-200) at www.uky.edu/ag/forage. UK

>Krista Lea, MS, UK Horse Pasture Evaluation Coordinator, and Jimmy Henning, PhD, forage extension specialist, both of UK's Department of Plant and Soil Sciences, provided this information.

Horses With Equine Cushing's Disease Needed for Research Projects

LEFT: UNIVERSITY OF KENTUCKY; RIGHT: COURTESY DR. AMANDA ADAMS

Dr. Amanda Adams maintains herds of aged, obese, and metabolic syndrome horses at UK, with the goal of improving these "special needs" horses' health and well-being.

Amanda Adams, PhD, associate professor at the UK Gluck Equine Research Center, is seeking donations of horses with pituitary pars intermedia dysfunction (PPID, also known as equine Cushing's disease) for her research.

Adams' research focuses on equine immunology in aging, obesity/equine metabolic syndrome (EMS), and stress. Her program is unique in that she has established and maintains herds of aged, obese, and metabolic syndrome horses at UK, with the goal of improving these "special needs" horses' health and well-being.

Her program's aging component focuses on understanding how old age affects immune responses, with particular interest in vaccination and the inflammaging process. She is also working on understanding the impact of nutritional interventions and endocrine disease (such as PPID) on these responses.

The obesity component investigates the effects of obesity, in particular EMS. The goal is to identify novel diagnostics and treatment plans that target both the inflammatory and metabolic component of EMS, to monitor and prevent endocrinopathy-associated laminitis.

Lastly, her research involves investigating models of stress, including weaning and transport stress, and its impacts on immune and metabolic function.

For more information on donating a horse to Adams' program, visit gluck.ca.uky.edu/sites/gluck.ca.uky.edu/files/ppiddonation2018.pdf. UK

ANNE M. EBERHARDT/THE HORSE

Participants Needed for 2-Year-Old Thoroughbreds in Training Study

Researchers at the UK Gluck Equine Research Center are conducting a study to examine the rate of injury and illness in North American 2-year-old Thoroughbreds in training.

The project's goal is to determine the rate of injuries in these young horses through early July 2018. Participants are asked to answer several questions weekly about all their 2-year-olds in training using an online survey system.

Any trainers interested in this project are encouraged to visit **uky.az1.qualtrics.com/jfe/form/SV_0SV0vLsh20PXhRP** for more information and an enrollment form.

How Footing Impacts Musculoskeletal Health, Performance

The surface is one of the most common factors cited when an unexpected performance or injury occurs with an athletic horse. While the importance of surfaces can easily be overstated, unlike many other risk factors, surfaces impact every horse which competes at a venue. Epidemiological research also shows that the type of surface—dirt, turf, or wax-coated sand—has a statistically significant effect on injuries even when other factors are considered.

The mechanism responsible for the effect of surfaces on musculoskeletal disease is well established. The skeleton of the horse adapts to the dynamic loading of the bone. To minimize excess structure and to provide sufficient bone in highly loaded regions, bone is absorbed and deposited. The remodeling process produces a skeleton that is adapted to the horse's training. Building the optimal skeleton requires that the horse performs the specified task during training. The type of loading during training should match the expected loading during competition. However, the maximum performance might not be desirable during training; for example, the training distance could be shorter or the jumps lower. The overall loading directions should match that expected in competition and depends not only on activity but also on the manner in which the surface supports the horizontal and vertical loading by the horse.

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Epidemiological research shows that the type of surface—dirt, turf, or wax-coated sand—has a statistically significant effect on injuries even when other factors are considered.

Both the load rate and the magnitude of loading is critical to bone remodeling and the risk of fracture. Surfaces must also provide appropriate footing during all phases of the gait. Consider the initial loading on the leading foreleg of a horse at a gallop to illustrate the demands. During the initial impact of the hoof the loads are low, but the impact of the hoof on the surface occurs at a high speed. The loading, or firmness of the surface, primarily affects the peripheral bones in the leg. The smaller bones that have adapted to maximize the efficiency of the horse are quite susceptible to damage. During the secondary loading, the dynamic weight of the horse is transferred to the leg and long bones of the horse are then loaded. The cushioning of the surface reduces the rate of loading of the bones and the risk to the more proximal bones of the leg. While more research is needed, it is likely that both the training and competition surface should have optimal cushioning and firmness to ensure proper skeletal development while reducing the risk of injury. In addition to these two factors (cushioning and firmness) three additional characteristics have been developed to characterize the surface response for equestrian competitions: responsiveness, grip, and uniformity.

To minimize injury risk during competition and to support required bone development in training, further research is needed to better understand how surfaces impact performance and injuries in sport horses. In the interim, the current state of knowledge has been reviewed in white papers for racing and equestrian sports. Improved processes for the testing and approval of surfaces such as those under development by the

GRAD STUDENT SPOTLIGHT

BLAIRE FLEMING

From: Clarksville, Tennessee
Degrees and institute where received: BS in Animal and Dairy Science, minor in Spanish, Mississippi State University

UNIVERSITY OF KENTUCKY

Blaire Fleming had blue in her blood even before she was lucky enough to become an official Wildcat. Her older sister earned her undergraduate degree from UK, and Fleming always enjoyed visiting her in Lexington.

"What better place to get a degree with a specialization in equine reproductive physiology than the horse capital of the world," she said. "Better yet, at one of the most internationally renowned equine research centers."

Alejandro Esteller-Vico, PhD, assistant research professor at the Gluck Equine Research Center, is Fleming's mentor. She is currently characterizing carrier proteins in circulation in horses' bodies.

"Once characterized, they have the potential to be used as biomarkers for a few different things, specifically anabolic steroid abuse in racehorses," Fleming said.

When asked what her most valuable takeaway from the program was so far, she said, "You will never know everything there is to know. Things are always changing, and every day is a new learning experience. There is always an opportunity to discover."

Fleming will graduate in May 2018. She is considering whether to apply for a PhD position or see where she can apply her skills within the horse industry.

"With a degree from the Gluck Equine Research Center, I am blessed to have many options," she said. UK

>Alexandra Harper, MBA, is the operations and communications coordinator for the UK Ag Equine Programs.

Footing Impacts on Health, Performance

FEI show great promise for implementing current knowledge in a way that best protects both horse and rider.

Improvements in surfaces along with many other industry efforts have led to some of the recent reductions in catastrophic injuries in racehorses, a critical effort for the protection of the racing industry as well as all equestrian sports.

CONTACT—Michael "Mick" Peterson, PhD—mick.peterson@uky.edu—207/409-6872—UK Ag Equine Programs and Biosystems and Agricultural Engineering Department, Lexington. UK

>Reprinted from the Lloyd's *Equine Disease Quarterly*, January 2018, Volume 27, Number 1

Diagnosing Equine Neurologic Diseases

Many diseases can affect horses' central nervous systems, but four of the most common disorders are cervical vertebral stenotic myelopathy (CSM), equine protozoal myeloencephalitis (EPM), equine degenerative myeloencephalopathy (EDM), and equine herpesvirus-1 myeloencephalopathy (EHM).

Regardless of the cause, diagnostic evaluation begins with a neurologic examination, which provides anatomic localization of the problem within the central nervous system. Then the diagnostic investigation continues with more focused testing.

If CSM (also known as wobbler syndrome) is strongly suspected, radiographs of the neck should be taken. Narrowing of the cervical vertebral canal in combination with malformation of the cervical vertebrae results in spinal cord compression in CSM patients. Standing lateral radiographs of the cervical vertebrae often reveal bony malformations and probable narrowing of the vertebral canal. Myelography is an important antemortem diagnostic tool and is essential prior to surgical

Recognizing specific clinical signs, localizing anatomic lesions, and using diagnostic tests can help differentiate common neurologic diseases.

STEPHANIE L. CHURCH/THE HORSE

UKVDL

Disease Mapping Initiative FEATURED MAP

Nocardioform Placentitis Abortions

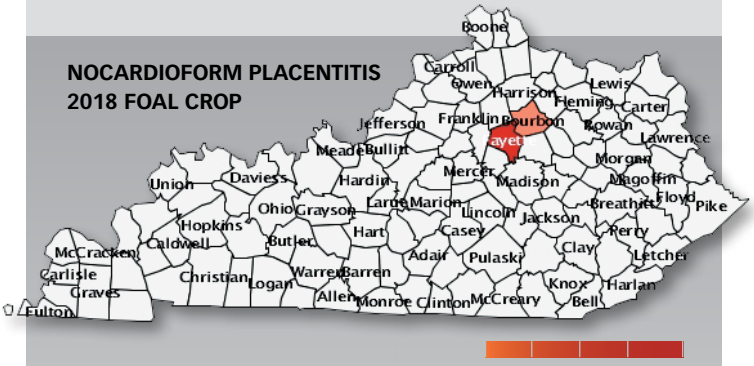
This month's featured map illustrates cases of nocardioform placentitis abortions in the 2018 foal crop.

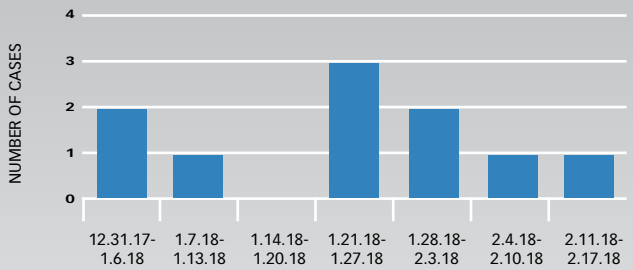
Nocardioform placentitis is a unique form of bacterial placentitis (inflammation of the placenta) affecting late-gestation mares, causing abortion, stillbirth, or foals born alive but compromised. The disease was first diagnosed in Central Kentucky in the 1980s and has also been reported in other areas of the United States and abroad. Nocardioform placentitis cases are diagnosed annually, with some years experiencing few cases and other years noting higher numbers.

See each month's featured map at vdl.uky.edu/FeaturedMap.aspx.

Individuals with questions or concerns about disease outbreaks can contact UK Veterinary Diagnostic Laboratory (UKVDL) at 859/257-8283. UK

>Jacqueline Smith, PhD, MSc, BSc, Dipl. AVES, UKVDL epidemiologist and adjunct professor of epidemiology at Lincoln Memorial University, is the founder of the UKVDL Disease Mapping Initiative, a database designed to record all infectious disease cases submitted to the UKVDL.





See each month's featured map at vdl.uky.edu/FeaturedMap

Neurologic Diseases

intervention. This condition occurs primarily in young horses (3 months to 1 year of age) where it is a multifactorial disease. In older horses, CSM is often secondary to osteoarthritis of vertebral articular process joints.

The neurologic exam for suspect EPM horses shows asymmetric ataxia, often with upper and lower motor neuron signs and muscle atrophy. *Sarcocystis neurona* is the most common cause of EPM, but *Neospora hughesi* infection can also cause similar clinical signs. Several studies of *S. neurona* demonstrate that horses residing in states with opossums have an exposure rate of 33% to 53%. The exposure rate for *N. hughesi* appears to be much lower, although less epidemiologic data is available for this organism. Risk factors for *S. neurona* infection include age (younger than 5 and older than 13 years), time of year (summer and spring more than winter), whether previous cases had been recognized on the farm, presence of a wooded area, and presence of opossums on the farm. Prevalence of the disease was reduced on farms where wildlife had little or no access to feed and if a creek or river was on the premises. Diagnosis of EPM remains a challenge and should begin with physical and neurological examinations. This is followed by measurement of antibodies against the causative organisms in blood and cerebrospinal fluid. Unfortunately, the only definitive test for EPM is a post-mortem examination.

The third common cause of spinal ataxia in horses is EDM. This condition has been recognized in several breeds and has a familial predisposition. It is caused by oxidative damage to proprioceptive relay tracts, thus measurement of vitamin E has been used as a marker for this condition. More recently a genetic marker has been associated with the disease and genetic testing has proved valuable.

Finally, EHM is an infrequent but serious outcome of equine herpesvirus-1 infection. Although the virus has been recognized for a long time, a link to neurologic disease was only made in the past fifty years. More recently, a point mutation in the virus has been identified that allows it to replicate rapidly and results in a higher frequency of neurologic disease. Damage to the nervous system develops near infected blood vessels, which results in "stroke-like" episodes. The disease usually follows an initial phase of viral replication in the respiratory tract and peripheral blood mononuclear cells. Viral replication also occurs in respiratory epithelium, gonadal cells, and tissues of the gestating fetus. Infection can result in fever, respiratory disease, weak foals, abortion, and neurologic disease. Neurologic signs often include ascending paralysis with urine dribbling, loss of anal tone and control, poor tail tone, and pelvic limb weakness. Diagnosis of EHM is easier to establish when several horses on the same premises present with fever, followed by ataxia and urine dribbling and in some cases abortion. When spinal fluid is collected it often appears xanthochromic (yellow in color) as a result of the vascular damage leading to increased protein but no increase in cell count. Beyond this, diagnosis can be established by recognition of clinical signs and positive EHV-1 polymerase chain reaction results of a nasal swab and buffy coat. Confirmation of the disease is by virus isolation in cell culture.

Recognition of specific clinical signs, anatomic localization of lesions, and utilization of diagnostic tests can help differentiate the common neurologic diseases.

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>Reprinted from the Lloyd's *Equine Disease Quarterly*, January 2018, Volume 27, Number 1

Mineral of the Month: Copper

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Broodmares in the last few months of pregnancy and throughout lactation require additional copper in their diets.

Copper was first discovered between 3000 and 6000 B.C. Like zinc, its uses were centered around constructing metal objects, most commonly in the form of the copper alloys, bronze, and brass.

References to copper in ancient medicinal records indicate that many cultures believed copper had antiseptic properties. Around 1817, scientists learned that plants contain low copper concentrations. This was followed several years later by the discovery of copper in animal and human tissues. However, it was only in 1928 that scientists recognized the essentiality of dietary copper. This finding negated previous assumptions that copper was present in plant and human or animal tissues as the result of environmental contamination.

Today copper is known to function as an essential cofactor for numerous enzymes in the body, which makes it an important mineral, even if only required in trace amounts. These enzymes' functions are diverse and range from connective tissue development via lysyl oxidase, to antioxidant functions by means of superoxide dismutase, to melanin synthesis.

In the past, young growing horses' copper status received a lot of interest, as some study results suggested a link between low copper status and developmental orthopedic disease. More recent work in this area highlighted the importance of total dietary mineral balance, in addition to multiple nonnutritional factors that could be involved.

The current dietary copper recommendation for a mature horse weighing 500 kilograms (1,100 pounds) that is idle or lightly exercised is 100 mg per day. This recommendation increases to 125 mg per day for a 500-kilogram broodmare in the last few months of pregnancy and throughout lactation, as well as a horse with a heavy exercise load.

The copper concentration in common equine feedstuffs varies. In addition, copper metabolism can be influenced by factors such as interactions with other minerals. Excessive dietary zinc concentrations have been shown to negatively affect copper metabolism in weanlings, but unlike in ruminants, dietary molybdenum has less of an impact on horses.

Commercially produced feeds are balanced to ensure horses receive minerals in sufficient quantities when fed according to the manufacturers' recommendations. Commercial horse feeds usually contain one or more of the many forms of inorganic or organic sources of copper available. The maximum tolerable level of copper in equine diets is 250 mg/kg, which is higher than the maximum tolerable level of copper for cattle and sheep. Cattle and sheep are more vulnerable to copper toxicity than horses, swine, or poultry.

It is always a good idea to work with a nutritionist if you would like to add additional supplements to your horse's diet. A nutritionist can help you to evaluate your horses' entire diet, ensuring a balanced total dietary mineral intake. UK

>Mieke Holder, PhD, is an assistant research professor within UK's Department of Animal and Food Sciences.

Studying Catastrophic Racehorse Breakdowns: Research That Can Save Lives

At the Feb. 2 UK Equine Showcase, Laura Kennedy, DVM, Dipl. ACVP, assistant professor and veterinary pathologist at the UK Veterinary Diagnostic Laboratory, shared what researchers are learning about catastrophic breakdowns in racehorses. She discussed how the Kentucky Horse Racing Necropsy Program began as well as what the group studies and some of its findings.

Kennedy said the Necropsy Program was started in 2009 following two high-profile cases of catastrophic breakdowns: 2006 Kentucky Derby winner Barbaro, who sustained serious injuries in that year's Preakness Stakes and eventually succumbed to related issues in 2007, and Eight Belles, who broke down and was euthanized on the track after finished second in the 2008 Kentucky Derby. Since its founding, the program has documented injuries and, over time, has expanded its research. From 2009 to 2012, racing fatalities were examined; beginning in 2012, all fatalities (racing, training, and medical) that occurred at sanctioned racetracks in Kentucky were examined.

Just like in human athletes, Kennedy said, horses' bodies experience repetitive use wear as they train and compete over their lifetime, and more than 85% of catastrophic injuries result from pre-existing conditions when it is a musculoskeletal-related fatality.

The wear related to a catastrophic breakdown can be shown as also occurring on the opposing (contralateral) limb. That's why pathologists examine both limbs at necropsy, to document the fatal event as well as changes in the contralateral limb, which can provide valuable information regarding the horse's condition. Examination protocols have become

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Catastrophic Injuries

increasingly formalized and standardized, Kennedy said, resulting in the development of a scoring system for pre-existing conditions to provide a quantitative evaluation that is better suited to research aims.

Part of the problem with evaluating wear on the horse's limbs, program researchers have found, is a disconnect between the horse's overall fitness and the skeletal structure's fitness. A horse can become strong and in top form quickly during race training, but the bones take time to build strength against the hard impact of galloping.

"You can get a horse really fit really fast, but there's no way to rush bone," Kennedy said.

As mentioned, Necropsy Program researchers complete a standard examination for every horse with catastrophic injuries they assess. The group documents pre-existing conditions and examines pathology from all angles to better understand each breakdown. That knowledge then contributes to the overall understanding of catastrophic breakdowns in racehorses in general.

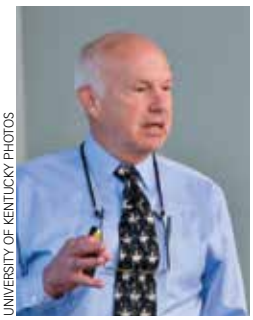
The Kentucky Horse Racing Necropsy Program hopes to make a difference in the number of catastrophic breakdowns that occur. Kennedy said one of the program's overarching goals is to identify horses with pre-existing conditions that could lead to fatalities and intervene before a catastrophic breakdown occurs. Kennedy also stressed that the hazards of a catastrophic breakdown are not only to the horse but also to jockeys, as they can be injured or even killed when an equine racing fatality occurs.

Kennedy concluded her talk by explaining that Kentucky Horse Racing Necropsy Program researchers will be working closely with the UK Equestrian Sports Research Initiative, especially the Equine Sports Science Initiative. They will gather data driven research and communicate the outcomes to grooms and trainers in the industry, in hopes that catastrophic breakdowns can continue to be prevented as much as possible. UK

>Maddie Regis, a junior majoring in marketing, is a communications and alumni relations intern for UK Ag Equine Programs.

UK Ag Equine Programs Showcase, Kentucky Breeders' Short Course Held Feb. 2-3

UNIVERSITY OF KENTUCKY PHOTOS



Dr. Charles Love spoke at the Kentucky Breeders' Short Course.

Dr. Mary Scollay spoke at the UK Equine Showcase.

Dr. Mick Peterson thanked the sponsors that supported the Equine Showcase and Kentucky Breeders' Short Course.

The UK Equine Showcase and Kentucky Breeders' Short Course attracted more than 120 attendees Feb. 2-3 at the Fayette County Extension Office, in Lexington.

Speakers at this year's event included researchers and veterinarians from UK's Gluck Equine Research Center, Hagyard Equine Medical Institute, Kentucky Horse Racing Commission, Rood & Riddle Equine Hospital, Texas A&M University, UK College of Health Sciences, UK College of Public Health, UK Department of Animal and Food Sciences, UK Department of Biosystems and Agriculture Engineering, and the UK Veterinary Diagnostic Laboratory.

Presentation topics included:

- Racing injuries: a brief history and the industry's response;
- Equine catastrophic breakdowns: what we know and where we are going;
- Skeletal pathology of the Thoroughbred racehorse: the fetlock;
- Concussion management: more than testing the importance of medial informational system in racing;
- Prevention of horse-related injuries and concussion assessment: where education efforts should be focused;
- Female rider health: why do we need breast health research and outreach?;
- Nocardioform placentitis in the mare;
- Breeding record evaluation;
- Assessing stallion semen;
- Metabolic syndrome and reproduction;
- Nutritional management of the broodmare;
- Diagnosing and managing oviductal problems in mares;
- Assisted reproductive techniques: where we are and where we hope to go; and
- How to interpret endocrine diagnostic tests for the subfertile mare.

Event support was provided by sponsors Ag Credit, Breeder's Choice, Kentucky Equine Research, Kentucky Performance Products, McCauley's, Minitube, North American Equine Ranching Information Council, Park Equine Hospital, Rood & Riddle Equine Hospital, Tribute Equine Nutrition, and Zoetis. UK

>Hailee Adams, an equine science and management major, is a communications and alumni relations intern for UK Ag Equine Programs.

Upcoming Event

March 6, 4:30-7 p.m.

UK Equine Career & Opportunity Fair, Spindletop Hall, Lexington.