University of Kentucky

Bluegrass Equine DIGEST

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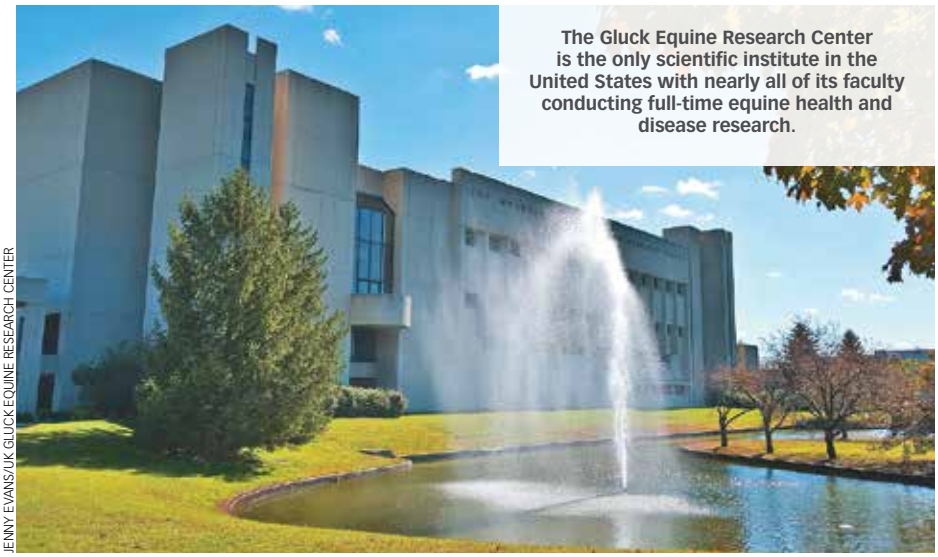
KTOB Foundation Invests in Equine Research at Gluck Center



JENNY EVANS/UK GLUCK EQUINE RESEARCH CENTER

The Gluck Equine Research Center is the only scientific institute in the United States with nearly all of its faculty conducting full-time equine health and disease research.

The Kentucky Thoroughbred Owners and Breeders (KTOB) Foundation announced May 1 that it will invest $250,000 in the University of Kentucky's (UK) Maxwell H. Gluck Equine Research Center.

The university will match the gift, which will enable the Gluck Center to renovate an equine infectious disease research laboratory.

The KTOB Foundation and the Gluck Center will also create a partnership facilitating a joint response in the event of an equine crisis. The renovated laboratory is essential to that response.

"Over the years, the support received by the Gluck Equine Research Center from the KTA (Kentucky Thoroughbred Association)/KTOB has proved invaluable and essential to our world-renowned faculty in fulfilling our mission to enhance the well-being of the equine," said Stuart Brown, DVM, veterinarian and chair of the Gluck Equine Research Foundation Board. "This most recent contribution will continue to allow us to sustain this commitment in meeting the challenges that face our stakeholders, whenever they may occur, in caring for their horses on a daily basis."

The Gluck Equine Research Center is the only scientific institute in the United States with nearly all of its faculty conducting full-time equine health and disease research. It is critical that its scientists be on the cutting edge of technology and ready to respond to any crisis that might occur, as it did with its rapid response to mare reproductive loss syndrome (MRLS).

"As the custodian of funds raised during the mare reproductive loss syndrome in 2001, our sole mission is to immediately respond to an existential threat to the breeding industry in Central Kentucky," said Jimmy Bell, president of the KTOB Foundation. "Maintaining world-class research in infectious disease infrastructure at the UK Gluck Equine Research Center is imperative to being prepared for a future emergency."

The foundation has been an important partner of the college for many years.

"The College of Agriculture, Food and Environment appreciates the long-term partnership with the KTOB Foundation," said Dean Nancy Cox, MS, PhD. "KTA/KTOB is a trusted advisor to our college in our quest to serve and support Kentucky's signature industry. This gift helps our research program in the most foundational way by providing the kind of laboratory technologies that drive research innovations."

David Horohov, PhD, department chair and Gluck Equine Research Center director, added, "This grant from the KTOB Foundation enables us to update our facilities to better position the Gluck Center to recruit world-class researchers in the area of infectious

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diseases. This partnership will also lead to the establishment of an annual stakeholders meeting to discuss potential emerging threats and how to respond in the event of an emergency."

Pope McLean Jr., KTA/KTOB president, said the association will repay the KTOB Foundation over a short period to maintain $500,000 in the event of an emergency similar to MRLS. No further grants will be made during this vesting period.

"Both the gift and repayment are consistent with our dual mandate to promote and protect the Thoroughbred industry in the commonwealth of Kentucky," he said.

The Gluck Center's mission is scientific discovery, education, and dissemination of knowledge for the benefit of horse health and well-being. The Gluck Center faculty conducts equine research in seven targeted areas: genetics and genomics, immunology, infectious diseases, musculoskeletal science, parasitology, pharmacology/toxicology, and reproductive health. Their continuing efforts build upon a tradition of excellence in equine research dating back to 1915.

The KTA is a horseman's group and KTOB is a trade association, both representing Kentucky's Thoroughbred breeding and racing industries. UK

>Jenny Evans, MFA, PhD candidate, is the senior veterinary science marketing/promotion specialist at the UK Gluck Equine Research Center.

Oladunni Receives AQHA Young Investigator Award

Fatai Oladunni, DVM, MS, a PhD candidate at the UK Gluck Equine Research Center, recently received an American Quarter Horse Foundation Young Investigator Award to study how equine herpesvirus-1 (EHV-1) suppresses type-1 interferon (IFN, a large subgroup of interferon proteins that help regulate immune system activity) responses.

"Funding agencies are a vital part of the research process," Oladunni said. "Without the help of groups like the American Quarter Horse Association (AQHA) it would be difficult or impossible to make progress in the world of science. For this reason, I am genuinely grateful to AQHA for selecting my work amongst the pool of other great ideas."

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Oladunni's mentor, Thomas Chambers, PhD, professor at the Gluck Center, said 100 years ago viruses were just being discovered to be causes of infectious diseases.

"Over that century we have made great strides in controlling some viruses like rabies," Chambers said. "With the equine herpesviruses we have made a lot of progress, but this is still a complicated issue and there is plenty of work left to do."

Training the next generation of researchers is also one of the Gluck Center's most important missions.

"We are grateful to AQHA for their support of young investigators like Fatai who bring fresh energy and new approaches to solving the problems of equine health and disease," Chambers said.

Oladunni said he hopes his research will help identify certain critical steps in the virus replication cycle, which is indispensable for its ability to infect host cells.

"I also hope to unravel how the host type-I IFN response is dampened as a consequence of EHV-1 infection," he said. "Data from this study could also be useful in identifying key EHV-1 protein targets that can serve as protective vaccine candidates. These are some of the immediate knowledge gaps that this research aims to fill."

Oladunni will receive more than $19,000 for his project, "Elucidation of the Mechanism of Suppression of Type-1 IFN Response by Equine Herpesvirus-1," which will commence in October. UK

>Jenny Evans, MFA, PhD candidate, is the senior veterinary science marketing/promotion specialist at the UK Gluck Equine Research Center.

Masthead

University of Kentucky Ag Equine Programs

Jenny Evans, MFA, co-managing editor and senior veterinary science marketing and promotion specialist, jenny.evans@uky.edu

Holly Wiemers, MA, APR, co-managing editor and communications director of UK Ag Equine Programs, holly.wiemers@uky.edu

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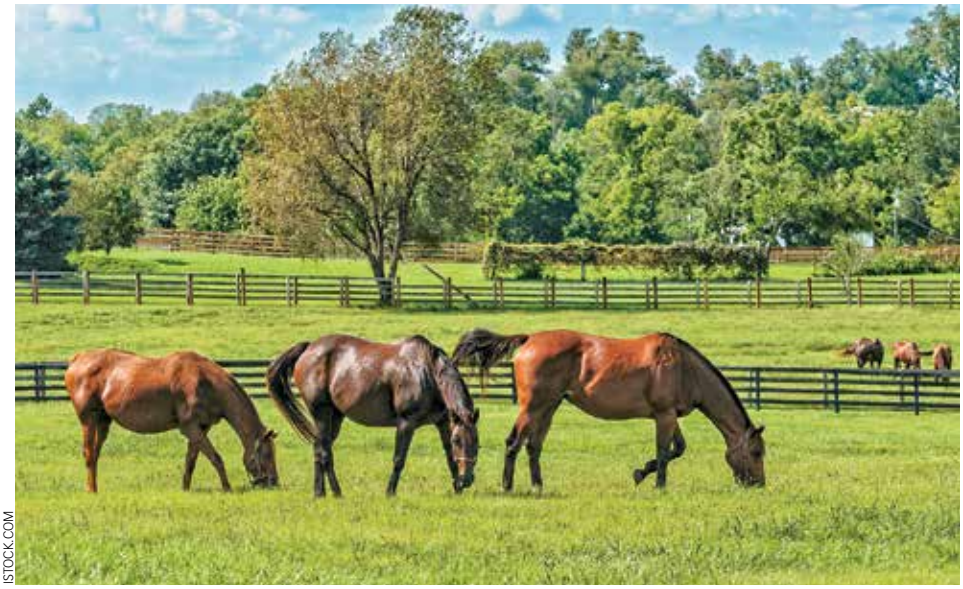
Fedorka Starts Crowdfunding Campaign for Hormone Therapy Research



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Researchers estimate that one in three mares will receive hormone therapy at some point in her life.

Carleigh Fedorka, PhD, a postdoctoral scholar at the UK Gluck Equine Research Center, has started a crowdfunding campaign for her equine hormone therapy research.

The study, "Hormone Therapy: Suppressing your mare's estrous, or suppressing her immune system?" is part of the Horse Nation Equine Research Challenge Grant on experiment.com, a crowdfunding platform specifically for scientific research. Fedorka hopes to raise $4,500 by June 8.

Fedorka said this research is important because scientists believe one in three mares will receive a hormone therapy at some point in her life.

"In order to improve the overall health of our sport horses, broodmares, and racehorses, it is imperative that we understand the effects of these medications in other parts of the body," she said. "Data from our lab indicates that altrenogest does have an effect on the immune system, but we have not studied MPA (medroxyprogesterone acetate) or the receptors and pathways through which they both function. Improved knowledge on how they work and the effects that they have will lead to management changes that improve the general health of our horses."

Watch a video of Fedorka explaining her project and support her research at experiment.com/projects/hormone-therapy-suppressing-your-mares-estrous-or-suppressing-her-immune-system. UK

>Jenny Evans, MFA, PhD candidate, is the senior veterinary science marketing/promotion specialist at the UK Gluck Equine Research Center.

Researchers Examining Effects of Indoor Arenas on Horse, Human Health

While many riders dream of having an indoor arena at their disposal for warmer winter or cooler summer riding, little research has been conducted on indoor riding environments. Specifically, it's not clear how riding in enclosed structures impact horse and rider health.

To remedy this gap, a graduate student in the UK College of Agriculture, Food and Environment's Department of Biosystems and Agricultural Engineering is conducting a survey to learn more.

Master's degree candidate Staci McGill intends to gather information on how environmental exposures and arena design impact heat transfer, air quality, and horse and rider health. The survey will be available through July 24 at uky.az1.qualtrics.com/jfe/form/SV_cGxVEkR25RbJdmR.

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Researchers hope to learn more about how riding in enclosed structures impacts horse and rider health.

The survey asks owners, managers, and riders about air quality, conditions, arena footing, and associated health outcomes in horses and humans. It also includes questions about arena design, such as footing, maintenance, number of windows and doors, the arena environment, and if horses are stabled in the same building.

"I am a rider who has always been conscious of the fact that our horses are athletes," McGill said. "We ask them to do so much for us, and yet I've seen so many who are coughing or tripping and just not performing to the best of their ability. I wondered if the environment they are in affects them, and I wanted to learn more."

McGill said she will examine if there are common characteristics or designs used in the construction of

Indoor Arenas

indoor riding arenas, determine what ventilation is used, and identify areas of concern from a health perspective. The accumulated data will ultimately result in advice on better design to provide the healthiest environment for horses, riders, trainers, instructors, and spectators of equine sports, she said.

"We suspect there are some common environmental challenges in arenas like dust levels and moisture management," said Morgan Hayes, PhD, PE, livestock systems extension specialist and McGill's advisor. "Quantifying the percent of arena owners and occupants with environmental concerns will assist with prioritizing research needs."

"We suspect there are some common environmental challenges in arenas like dust levels and moisture management."

MORGAN HAYES, PHD, PE

Another of McGill's committee advisors, Mick Peterson, PhD, director of UK Ag Equine Programs, explained the importance of the research: "In spite of the association of horse arenas with human and equine health, they continue to be built based on experience rather than science. This engineering research will help inform efforts within the industry to develop a more systematic understanding of the materials and designs of equine arenas."

Kimberly Tumlin, PhD, assistant dean in the UK College of Public Health and another of McGill's master's degree committee members, added, "Environmental and occupational health are fundamental aspects of public health, and this research touches on both in the equestrian population. I am delighted to collaborate on a project that will provide a framework to potentially improve health outcomes across both occupational and recreational use of indoor equestrian arenas.

"This survey combines one of the first lines of assurance of environmental and occupational health, the design and engineering controls to minimize or eliminate environmental exposures," she said. "The participants in this survey will help us understand how design factors impact health outcomes, particularly in temperature and respiratory exposures."

McGill's area of concentration is livestock systems engineering and controlled environment engineering. Other advisors on McGill's committee include Joseph Taraba, PhD, bioenvironmental engineering extension specialist, and Bob Coleman, PhD, extension horse specialist. UK

>Holly Wiemers, MA, APR, is communications and managing director for UK Ag Equine Programs.

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Affected foals have extremely fragile skin and abnormal joint laxity.

Researchers Evaluating Warmblood Fragile Foal Syndrome Test

The University of Kentucky's Genetic Testing at Gluck laboratory is working to validate a test for Warmblood fragile foal syndrome after several stallions were identified as carriers of the mutation in the LH1 gene (also known as PLOD1).

This autosomal recessive disorder, which results in extremely fragile skin and abnormal joint laxity, occurs, as the name suggests, primarily in Warmbloods. A foal must inherit the mutation from both parents to be affected. The KWPN-NA (the North American Dutch Warmblood studbook) recently established a mandatory testing policy for stallions; find more information about that rule at kwpn-na.org/about/new-policy-for-stallions-regarding-warmblood-fragile-foal-syndrome-wffs.

The test will identify carriers so breeders can avoid pairing two carriers. Animals carrying one copy of the mutation are apparently unaffected.

The test can be performed using hair samples. Cost will be $40 per sample, with special pricing available through Genetic Testing at Gluck contract registries.

For more information contact Kathy Graves, PhD, director of Genetic Testing at Gluck, at 859/218-1193 or ktgraves@uky.edu, or visit getgluck.ca.uky.edu. UK

>Jenny Evans, MFA, PhD candidate, is the senior veterinary science marketing/promotion specialist at the UK Gluck Equine Research Center.

Female Equestrian Health Community of Practice Established at UK

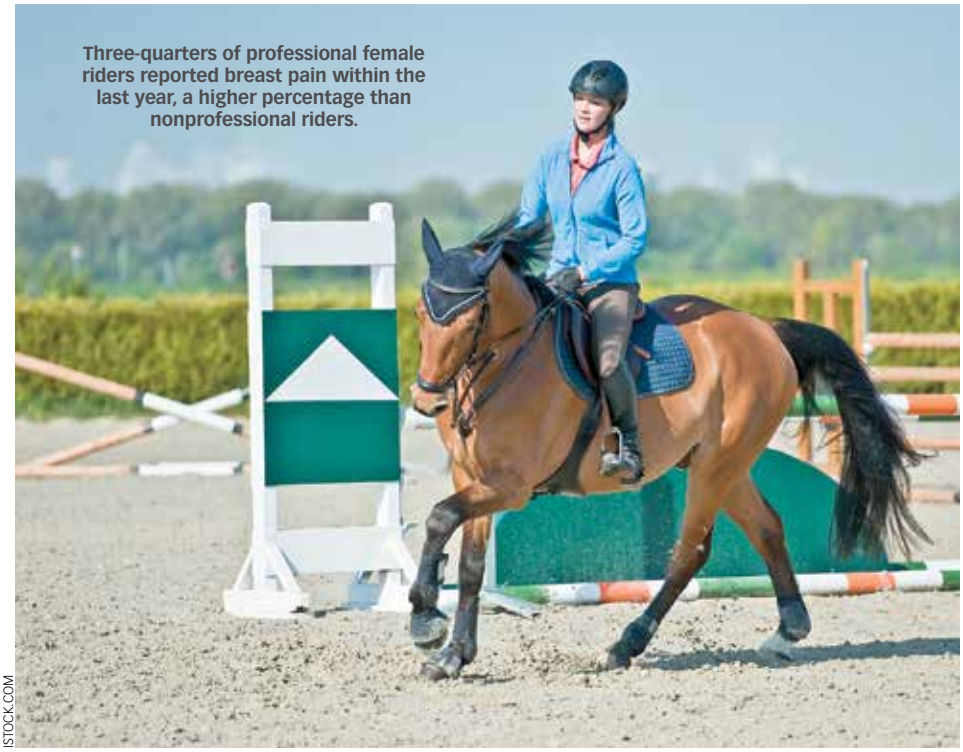
Researchers have conducted a large amount of research on horse health and well-being and on rider injury and injury prevention. However, they've conducted less research on female equestrian health and wellness over riders' lifespans. An international group of researchers and experts aim to fill this knowledge gap by participating in a community of practice (CoP).

The idea for a CoP stems from research by Karin Pekarchik, who conducted a survey in the spring of 2017 on female equestrian breast discomfort/pain and other health issues. She and her research collaborator Kimberly Tumlin, PhD, of the UK College of Public Health, have been working with British researchers Jenny Burbage, PhD, of the University of Portsmouth, and Lorna Cameron, of Sparsholt Centre College, both in England, to better understand breast health and discomfort that limits riding.

As Pekarchik and Tumlin first reported at the 7th Annual UK Equine Showcase, 75% of all professional female riders who participated in the survey reported breast pain within the last year, a higher percentage than nonprofessionals, and riding activity resulted in a higher proportion of professional equestrians with small cup sizes reporting pain.

From these data and the initial collaboration, Pekarchik and Tumlin recognized that additional aspects of female equestrianism were underresearched. That inspired them to start the CoP. By connecting researchers and industry experts globally, they believe a collective understanding of the influences on equestrian health and wellness can be established and sustained through collaborative funding efforts and educational outreach to promote both horse and human health.

Organized and moderated by Pekarchik and Tumlin, the Female Equestrian Health and Wellness CoP has more than 26 members, including experts from the U.S., Canada, Ireland, England, and Australia. The CoP will meet six times a year to share information on ongoing trends and research discoveries within different areas of emphasis, including engagement in equestrian sport, cumulative injuries, environmental exposures, occupational safety, pain and quality of life considerations, breast biomechanics, and systems designs and engineering.



Three-quarters of professional female riders reported breast pain within the last year, a higher percentage than nonprofessional riders.

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The CoP's first meeting took place on May 15. At the conclusion of the first year, the CoP will publish a white paper that will delineate areas of strengths and weaknesses and identify research priorities for the female equestrian.

Visit www.uky.edu/equestrians or e-mail karin.pekarchik@uky.edu or kimberly.tumlin@uky.edu for more information. UK

>Karin Pekarchik, a senior extension associate for Distance Learning within UK's Biosystems and Agricultural Engineering, provided this information.

Mineral of the Month: Iron

If you lived sometime before the 17th century, there is a good chance you'd be convinced that an iron (Fe) deficiency caused baldness. One of the suggested treatments at the time was consuming iron-tempered wine, produced by placing Fe filings or a rusty knife in a glass of wine. Later in the 17th century, doctors began using Fe to treat anemia. Today Fe's role in oxygen transport is well-understood, and researchers estimate that as much as 60% of the body's Fe can be found in blood hemoglobin (a protein in red blood cells that circulates oxygen throughout the body).

Although Fe content varies by geographic location, it remains one of the most abundant metals in soil and rock. Plant Fe content tends to reflect that of the soil, but soil type can affect the Fe availability. When taking pasture samples for nutrient analysis purposes, especially if Fe is a nutrient of interest, it is important to collect the samples with care. Including soil in your sample will result in an inflated Fe concentration in the final nutrient analysis report, not reflecting your pasture's true Fe concentration.

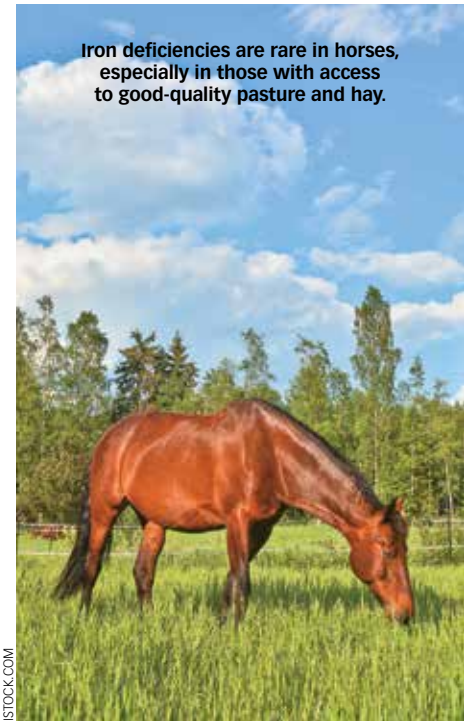
Typically, forages contain sufficient Fe to meet a horse's Fe requirement (recommended by the National Research Council, authors of *Nutrient Requirements of Horses*, 2007) of 400 milligrams per day for a 500-kilogram (1,100-pound) horse in light exercise. Horses in more intense exercise, broodmares in late pregnancy or lactation, and growing horses have a higher Fe requirement than horses at rest.

Mineral of the Month

Overall, Fe deficiency in horses is rare, especially for those with access to pasture and hay. However, foals, similar to other young nursing animals and children, are more susceptible to Fe deficiency than adult horses due to their rapid growth rates. The foal's digestive tract is efficient at absorbing Fe, and additional Fe supplementation in young foals should only be provided under veterinary supervision. It is thought that a true Fe deficiency or anemia in an adult horse would more likely be due to prolonged or excessive blood loss than insufficient dietary Fe intake.

Different forms (i.e., inorganic and organic) of Fe supplements are available and can be incorporated into commercial horse feeds (don't worry, you don't have to give your horse iron-tempered wine!) However, the body is efficient at regulating Fe absorption according to its requirements. Excessive amounts of dietary Fe can also interact with other minerals in your horse's diet. Therefore, contact a nutritionist to help you assess your horse's diet and specific nutrient requirements should you have questions about his or her Fe intake. UK

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



Iron deficiencies are rare in horses, especially in those with access to good-quality pasture and hay.

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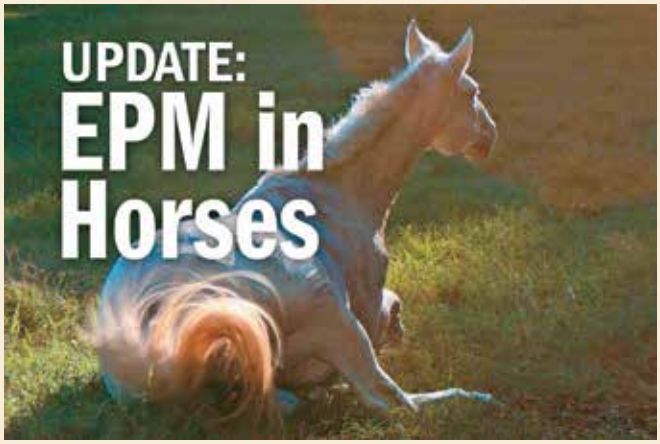
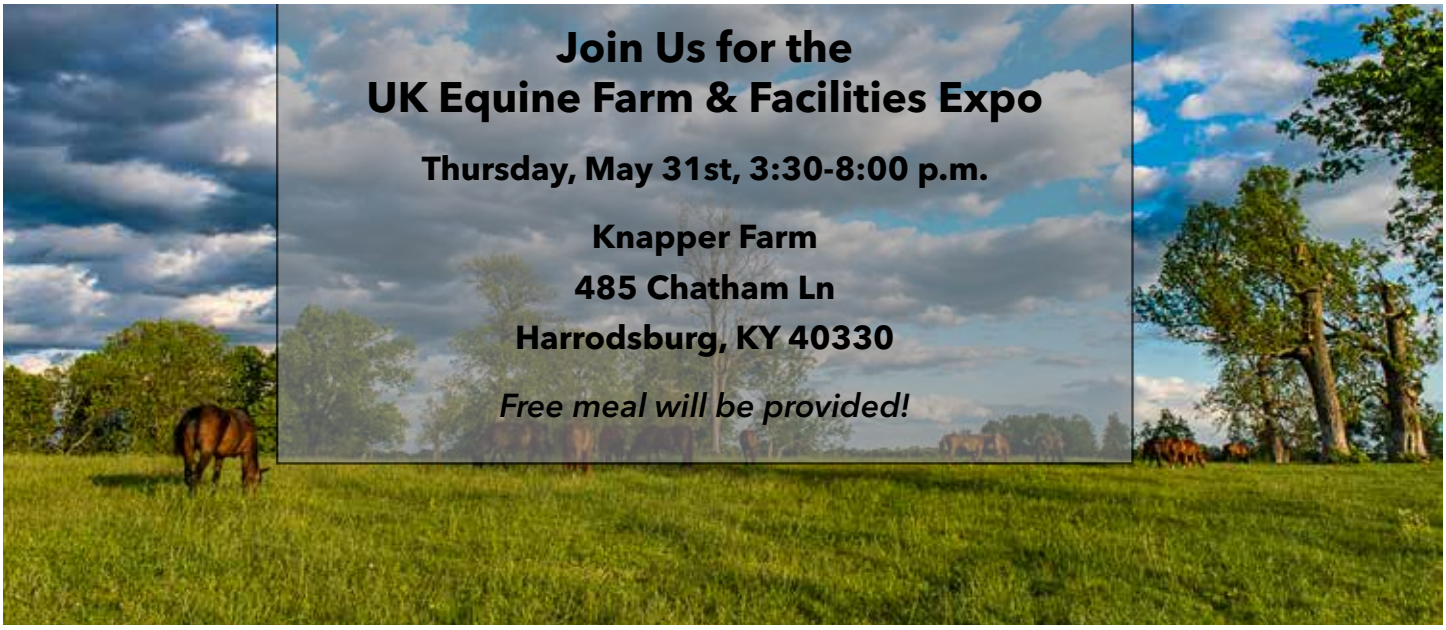


thehorse.com/features/epm-in-horses

Update: EPM in Horses

Here's what we know about this equine neurologic disease and where the research is headed.

Dan Howe, PhD, professor at UK's Gluck Equine Research Center, is one of several researchers interviewed in this special feature about equine protozoal myeloencephalitis.



Program

3:30 – Registration

4:00 - Exhibitor Booths

5:00 – Welcome, Dinner provided by the Mercer County Cattlemen's Association

5:30 – **Keynote Speaker: Utilizing Cost Share to Improve Grazing, Profitability and Resource Protection on Horse Farms**, *Adam Jones, NRCS State Grazing Specialist*

6:00-8:00 Educational Sessions, concurrently every half hour:

- **Weed Control Following a Wet Spring**, *Dr. Bill Witt and Keenan Bishop*
- **Implementing Rotational Grazing on Horse Farms**, *Steve Musen and Dr. Bob Coleman*
- **Ryegrass to the Rescue! Quick Fixes for Mud, Toxic Tall Fescue and Overgrazing**, *Dr. Ray Smith*
- **Maintaining a Healthy Horse**, *Dr. Justin Murray*

Paul and Melita Knapper run a small Thoroughbred breeding and layup operation just south of Shaker Village of Pleasant Hill. They are also the first of three established demonstrations farms showcasing federal cost share opportunities on equine operations in Kentucky.

RSVP requested to equine@uky.edu or 859-257-2226

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College of Agriculture, Food and Environment

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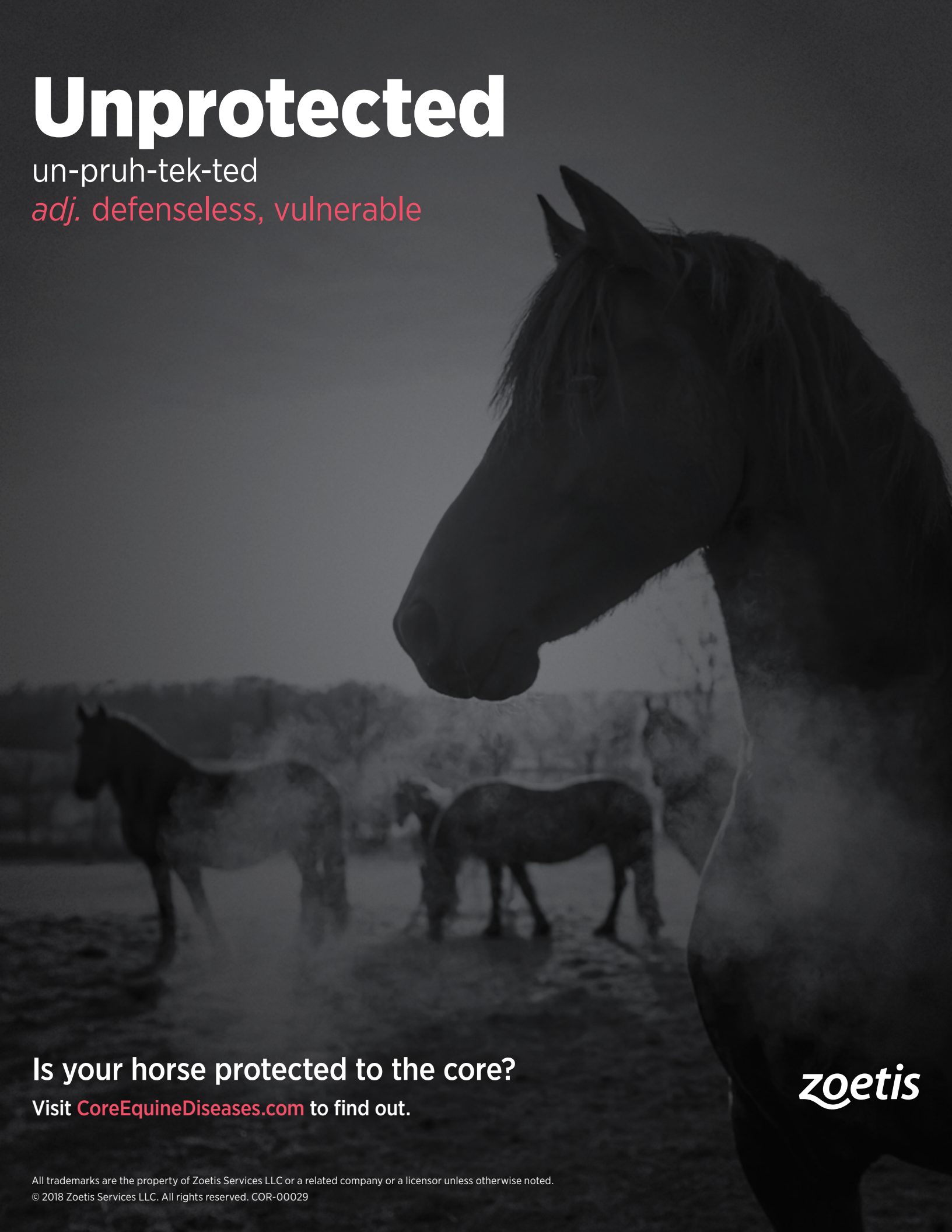

Upcoming Events

May 31, 3:30-8 p.m.

UK Equine Farm & Facilities Expo
Knapper Farm, 485 Chatham Ln, Harrodsburg, KY
Meal and educational topics provided.
Find more information at TheHorse.com/157464 and RSVP to equine@uky.edu.

June 28, 4-5 p.m.

UK Department of Veterinary Science Equine Diagnostic and Research Seminar Series
Topic: A Matter of Life and Death: Equine Neutrophil Apoptosis in Inflammatory Conditions of the Intestinal Tract
Speaker: Stacy Anderson, DVM, MVSc, PhD, Dipl. ACVS-LA, Lincoln Memorial University, Harrogate, Tennessee
Location: UK Veterinary Diagnostic Laboratory

Stay socially connected to UK Ag Equine Programs

The UK College of Agriculture, Food and Environment has several equine-related social media pages featuring the latest news and events information.

Follow us on Twitter:
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UK Maxwell H. Gluck Equine Research Center:
@UKGluckCenter
UK Veterinary Diagnostic Laboratory:
@UKVDL

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UK Ag Equine Programs: An overarching framework for all things equine at UK, including the undergraduate degree program, equine-related student organizations, equine research and outreach activities.

UK Equine Alumni: A community established for the alumni of UK's equine programs, including ESMA, graduate students and clubs and teams' members.

UK Maxwell H. Gluck Equine Research Center: The mission of the Gluck Center is scientific discovery, education and dissemination of knowledge for the benefit of the health and well-being of horses.

UK Veterinary Diagnostic Laboratory: The Veterinary Diagnostic Laboratory's mission is to develop and apply state-of-the-art diagnostic methodology to improve animal health and marketability, to protect the public health and to assist in the preservation of the human-animal bond through the principles of One Health.

UK Horse Pasture Evaluation Program: A service program offered to horse farms in Kentucky with the goal of overall improved pasture management.

Saddle Up SAFELY: A rider safety awareness program sponsored by UK HealthCare, UK College of Agriculture, Food and Environment and many community organizations. It aims to make a great sport safer though education about safe riding and horse handling practices. UK