

HIGHLIGHTING RESEARCH
AND OUTREACH EFFORTS AT
THE UNIVERSITY OF KENTUCKY

SUMMER 2022
ISSUE #0023

EQUINE SCIENCE REVIEW

CA.UKY.EDU/EQUINE
[@UKAGEQUINE](#) ON FACEBOOK/TWITTER

**mRNA BIOMARKER RESEARCH INTO
PREVENTING CATASTROPHIC INJURIES, 3**
Researchers recently began a large
study to validate previous research.

2022 KY EQUINE SURVEY UNDERWAY, 5
UK Ag Equine Programs, KY
Horse Council again partnering on
statewide comprehensive survey.

LESSONS LEARNED FROM ROTAVIRUS B, 6
During the 2021 foaling season
in KY, area farms experienced an
outbreak of neonatal foal diarrhea.

**UK AG EQUINE PROGRAMS WINS AT
AMERICAN HORSE PUBLICATIONS, 9**
The Equine Science Review won in
the newsletter business category.



College of Agriculture,
Food and Environment

WRITER, EDITOR AND LAYOUT

Holly Wiemers, MA, APR communications and managing director; UK Ag Equine Programs | holly.wiemers@uky.edu

EDITORIAL ADVISORY BOARD

Emma Adam, DVM, PhD, DACVIM, DACVS, assistant professor, research and industry liaison, Gluck Center

Bob Coleman, PhD, PAS, Dip. ACAN, associate professor and equine extension specialist, Animal and Food Sciences

Dan Howe, PhD, acting chair, Veterinary Science, acting director, Gluck Center

Laurie Lawrence, PhD, professor, Animal and Food Sciences

Krista Lea, MS, coordinator, UK Horse Pasture Evaluation Program, Plant and Soil Sciences

James N. MacLeod, VMD, PhD, director, UK Ag Equine Programs and John S. and Elizabeth A. Knight chair, Gluck Center

Martin Nielsen, DVM, PhD, Dipl. ACVM, Schlaikjer professor of Equine Infectious Disease, associate professor, Gluck Center

Mick Peterson, PhD, professor, Biosystems and Agricultural Engineering

Ray Smith, PhD, extension professor, Plant and Soil Sciences

Jill Stowe, PhD, associate professor, Agricultural Economics

DESIGN

Jordan Smith, marketing manager, UK College of Agriculture, Food and Environment

Equine Science Review is a monthly College of Agriculture, Food and Environment newsletter that highlights important equine work happening at the University of Kentucky.



Photo courtesy Dr. Jimmy Henning.

RACING INDUSTRY PARTNERS JOIN WITH UK TO SUPPORT PROMISING mRNA BIOMARKER RESEARCH INTO PREVENTING CATASTROPHIC RACEHORSE INJURIES

Catastrophic injuries in Thoroughbred racehorses are a top concern for the industry and for its fans. Researchers at the University of Kentucky's Gluck Equine Research Center share that sentiment and recently began a large study to validate previous research suggesting it is possible to detect specific markers that indicate an injury before it becomes career- or life-ending.

According to project lead Allen Page, DVM, PhD, staff scientist and veterinarian at the Gluck Center, and project collaborator Emma Adam, assistant professor and industry liaison at the Gluck Center and UK Veterinary Diagnostic Laboratory, the end goal is to be able to conduct an inexpensive and straightforward pre-race blood test identifying horses at risk of catastrophic injury, possibly allowing for intervention before those injuries happen. Previous research has shown that a majority of catastrophic injuries occur in horses with underlying or pre-existing musculoskeletal pathology, leading to the theory that catastrophic racing and training injuries are due to the accumulation of damage over time at a rate that exceeds the healing capacity of affected tissues.

Based on prior work in both human and equine athletes, Page and his colleagues have developed an approach for identifying this underlying damage using mRNA expression analysis of blood samples. The team has shown that horses with catastrophic injuries have significantly altered expression of IGF-1, IL1RN and MMP2 when compared to non-injured control horses. The researchers also recently found three new mRNA biomarkers that show fur-



PHOTO COURTESY MARK PEARSON PHOTOGRAPHY.

ther promise to predict injury.

To validate these findings, a new study began in February and will run for 12 to 16 months, utilizing 15,000 blood samples taken pre-race at three Southern California tracks. Samples are being drawn in tandem with standard pre-race testing, helping to make collection for the large research study more efficient. Initially, all samples will be stored before those from injured and select non-injured horse samples are analyzed and differences compared between the two groups.

Based on previous data and the planned collection of the samples, the research team anticipates they will test 10-15 catastrophically injured horses during the study.

According to Page, the blood test looking at the significant mRNA markers is correct 75-80 percent of the time when trying to identify a horse that will have an injury. The end goal for the team is the development of an easy-to-use and affordable blood test to help owners, trainers, veterinarians and

others make informed decisions benefiting the welfare of the horse.

"We appreciate our partners who have helped us do this large and complex project for the benefit of safety on the racetrack and to protect our human and equine athletes," said Nancy Cox, vice president for land-grant engagement at UK and dean for the College of Agriculture, Food and Environment.

"The collaborative support from the racing industry for this groundbreaking research resulting from this project is evidence of its significant contribution toward protecting our equine racing athletes," said Stuart Brown, veterinarian, vice president for equine safety with the Keeneland Association and Gluck Equine Research Foundation Board chair. "Dr. Page and the team of the Gluck Center have endeavored to provide those of us entrusted with the safety of the racehorse with a tool that can be utilized to objectively assess the individual horse for biomarkers contributing to our understanding

of an individual risk profile for that specific horse. The commitment from this team over the course of several studies while collecting samples across multiple jurisdictions represents a remarkable alignment of interests around the need to further our understanding of musculoskeletal injury in the racehorse.”

Funding for the current phase of the research has been provided by the Kentucky Horse Racing Commission’s Equine Drug Research Council, Keeneland Association, The Stronach Group, New York Racing Association, Breeders’ Cup Limited, Thoroughbred Owners and Breeders Association, Kentucky Thoroughbred Association, Del Mar Thoroughbred Club and the Thoroughbred Owners of Cali-

fornia. Additionally, the California Horse Racing Board, the Thoroughbred Owners of California and the California Thoroughbred Trainers are also owed a special note of gratitude for their support of the project and for helping to enable the project’s undertaking.

“Not surprisingly, a study of this size is both logistically challenging and expensive,” Page said. “That we have such outstanding financial and logistical support from leaders in the racing industry speaks not only to the wide-reaching impact of catastrophic injuries, but also to the industry’s hope that this project will provide a real-world solution to preventing injuries.”

“Multi-year support is essential to sustaining our research produc-

tivity,” said Dan Howe, interim director of the Gluck Center and interim chair for the UK Department of Veterinary Science. “As such, the Gluck Center is grateful for the Kentucky Horse Racing Commission’s investment in the first two phases of this project and to the broader consortium within the equine industry that has committed resources to complete the final phase of this important study aimed at safeguarding the health of racehorses. We are very enthusiastic about this specific project and the positive impact it will have for the horseracing community.”

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

INFLAMMATION AND ITS ROLE IN HEALTH AND DISEASE

We are all familiar with the classic symptoms of inflammation: redness, pain, swelling and heat. This reaction occurs in response to tissue injury caused by infection or physical damage.

While inflammation is often viewed as a pathologic condition, its purpose is to reinstate physiologic homeostasis in response to damage. The initial, or acute, inflammatory response is necessary to begin the healing process by eliminating debris and promoting cellular regeneration and replacement. Chronic or persistent inflammation, by contrast, can lead to a worsening of the pathology and further debilitation.

As such, the mechanisms underlying the initiation and resolution of inflammation are tightly regulated. A number of pro-inflammatory cytokines, which are proteins used for cellular communication, are involved in the induction of this response. Likewise, anti-inflammatory cytokines and other mediators serve to dampen and resolve the response once the noxious stimulus is removed. Therapeutic intervention can hasten this process by blocking some of the key intermediaries of the inflammatory response.

While nonsteroidal anti-inflammatory drugs (NSAIDs) are highly effective in limiting and resolving inflammatory conditions, they do not address the underlying cause of the inflammatory response. They can also interfere with the restorative aspects of the inflammatory response and delay the return to homeostasis. This, in addition to their other known side effects on gastric mucosa, warrants careful consideration prior to use. Nevertheless, NSAIDs are some of the most widely used medications in veterinary medicine.

Alternative approaches, including the use of nutritional supplements with anti-inflammatory properties, are widely available and heavily promoted. While some contain ingredients with anti-inflammatory properties, limited data is available regarding dosing, effectiveness and safety, especially for horses.

This issue of the *Equine Disease Quarterly* contains two articles addressing inflammatory responses. Allen Page’s article on the identification of biomarkers to predict injury risk for Thoroughbred racehorses is based on the observation that exercise-induced inflammation is exacerbated in horses at risk for musculoskeletal injury. Exercise is known to induce a certain degree of inflammation required for the repair of skeletal and muscle damage induced by the physical forces of exercise. However, exaggerated expression of some of these pro-inflammatory mediators and other related molecules likely signifies a situation where the damage is exceeding the capacity of repair mechanisms leading to a worsening condition and the possibility of a catastrophic failure. While NSAIDs may be used to treat post-exercise soreness, their impact on the restorative aspect of the inflammatory response is unknown.

| *Source: July Equine Disease Quarterly, David W. Horohov, PhD, Emeritus Professor, UK Gluck Equine Research Center*

2022 KENTUCKY EQUINE SURVEY UNDERWAY

University of Kentucky's Ag Equine Programs and the Kentucky Horse Council are again partnering on the 2022 Kentucky Equine Survey, a statewide comprehensive survey of all horse breeds. The study is in conjunction with the Kentucky field office of the U.S. Department of Agriculture's National Ag Statistics Service and is a follow-up to the study completed 10 years ago.

The USDA's National Agricultural Statistics Service is selecting 15,000 "horse-holds" to provide vital data about Kentucky's equestrian industry. Organizers urge those receiving a survey in the mail to promptly complete and return the information. There is an online option to completing the survey as well. For those who haven't completed the survey online or via the questionnaire, phone calls will also be made.

"If you receive a questionnaire in the mail, please complete it. It will take some time and effort, but the information that is collected is important to the future of our state's signature industry," said Jill Stowe, PhD, UK agricultural economics professor and project leader. "We are excited that the time has arrived, and we look forward to a strong response from Kentucky's horse operation owners."

The study seeks to obtain an accurate inventory of all equines in the state by breed and use. Horses, mules, donkeys and ponies being inventoried include those on owned farms as well as those being boarded at equine boarding and breeding facilities.

According to Sarah Coleman, executive director of the Kentucky Horse Council, accurate counts equines in Kentucky will improve equine health care, inform workforce development, aid in supporting proposals for business ventures and grants, identify emerging markets, and empower state and local policy makers with critical information to make informed decisions.



PHOTO COURTESY HANNAH WAROWAY.

KENTUCKY HORSE COUNCIL

UK Agriculture, Food and Environment

2022 EQUINE SURVEY

Help us protect our unique equine community!

All farm and individual names are confidential and will not be available to any state or federal agency, nor to UK or the Kentucky Horse Council. Stowe said they expect to have summary results from the survey in December, with in-depth results arriving in early 2023.

The study was partially funded by a Kentucky Agricultural Development Fund grant; additional funding has been secured by UK's

College of Agriculture, Food and Environment, the Kentucky Horse Council and a myriad equine industry supporters.

More information about the Kentucky Equine Survey can be found [here](#) or at the [Kentucky Horse Council](#).

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

BIOSECURITY ON EQUINE BREEDING FARMS: LESSONS LEARNED FROM ROTAVIRUS B

During the 2021 foaling season in central Kentucky, area farms experienced an outbreak of neonatal foal diarrhea. A novel equine rotavirus group B pathogen was implicated in the disease based on compelling genetic sequencing evidence coupled with the clinical scenario of a highly contagious pathogen that causes diarrhea in foals under 4 days of age.

A PCR test for the pathogen was quickly developed at the University of Kentucky, and testing information was shared with labs in the US, England, Ireland, France, Argentina and Japan. Unfortunately, the development of an efficacious vaccine has lagged behind, and disease control has focused on prevention through the implementation of increased biosecurity protocols.

The value of obtaining an accurate diagnosis can never be underestimated even when there are no available cures or protective vaccines. A confirmed diagnosis is vital to guide mitigation strategies, develop and fund vaccine research and leverage for increased biosecurity measures and compliance.

Biosecurity refers to measures aimed to prevent the introduction of pathogens and spread of infectious diseases. There are numerous resources referring to cleaning and disinfecting protocols, the use of personal protective equipment and the optimal movement of foot and vehicular traffic. Biosecurity protocols are never “one size fits all.” The principles are inviolate but the nuances and application to any particular farm or horse environment requires a tailored approach to ensure the plan is adapted to that farm. Developing a biosecurity plan is typically the easiest part

of the equation, but application and adhering to the protocol can be much more difficult.

Workflow, management culture and practices should be adapted to meet the needs of a particular location. Over and above determining the correct cleaning process, disinfectant choice, application technique or protective equipment is the process of understanding how a farm and its

crew work as a team. Biosecurity is as much about leadership as it is about the actual protocol itself. Time and again we see the heart-breaking results of a farm crew worn down by long hours tending sick animals and adhering to a protocol, only to find one member of the team who does not “buy in.” One breakdown in that team can be ruinous to the control of an outbreak and disastrous for morale.

Farm visits are a challenge in the face of an outbreak as we limit vehicular and foot traffic in vulnerable areas, such as the foaling barn. However, it is on these visits, observing how people interact with each other and their charges, that the key to success can be unlocked.

Development of a biosecurity protocol is a team effort where all members contribute thoughts on how to make a workable plan. This can be very hard to do, and suggestions from a third-party can often be beneficial. Outside personnel can often bridge gaps and identify



PHOTO COURTESY DR. LAURIE METCALFE, ROOD AND RIDDLE EQUINE HOSPITAL.

overlooked commonalities that can help bring everyone to the table, develop a plan and communicate the practicalities of a workable biosecurity plan. Creating cohesive units of people to care for groups of geographically isolated horses can be a helpful component of the plan.

Most people recognize the backbone of a biosecurity plan includes wearing gloves, using dedicated cleanable or disposable footwear and footbaths with appropriate disinfectant to prevent tracking of pathogens. Some factors can be more difficult to implement, such as limiting visitors and not using leaf blowers in barns.

Foaling outside with minimal contact with the newborn foal has been a tremendous help in stopping the transmission of disease from foal to foal. Where farms have adopted this practice, they have embraced it and found it to be beneficial on many levels, from foals getting better traction when attempting to stand, faster resolu-

tion of any post-partum perineal swelling in the mare and an overall calmness of the mare and her new foal, to mention but a few. Farms that have successfully adopted this practice are keen to share their learning curve as they encourage others to try it.

Disinfectants will not work effectively in the face of organic material (e.g., feces, dirt, bedding). By simply removing organic material, the pathogen load can be decreased by up to 90%. Stalls and floors typically require scrubbing with a detergent prior to application of a disinfectant unless a combination product is being used. Similarly, foot baths with disinfectant will only work when they are clean and changed regularly with the correct dilution of disinfectant product.

Items used in multiple stalls should be discouraged, but at a minimum they should be disinfected between animals and at the end

of the day. All staff and vehicular movements in the barn should proceed from clean to dirty, and foals showing signs of diarrhea should receive extra care in biosecurity. Aerosolization of infectious particles may occur with pressure washing or with the use of leaf blowers, so these practices should be avoided if there are animals in the barn or if the stall is expected to be occupied shortly after cleaning. Rotaviruses may survive up to nine months in the environment and therefore farms should not spread contaminated bedding or manure onto their pastures.

The goal of any biosecurity program is to reduce the exposure of animals to disease, requiring a multifaceted approach and collaboration between farm personnel, visitors and veterinarians. All farms should have basic biosecurity practices in place each foaling season and a plan to rapidly increase biosecurity in the event of

an infectious disease event. Until an efficacious vaccine is available for rotavirus group B, farms will continue to rely heavily on biosecurity practices to slow the spread of this highly contagious disease.

Caring for our horses is a team effort and the research performed at the UK Department of Veterinary Science is a vibrant collaboration between academia and industry stakeholders – we have to help each other. At the Gluck Equine Research Center, led by Feng Li, PhD, we are actively working towards the development of an equine rotavirus group B vaccine for the health of our foals and our industry, locally and globally.

| *Source: July Equine Disease Quarterly. Emma Adam, DVM, PhD, DACVIM, DACVS, is an assistant professor and research and industry liaison at the Gluck Equine Research Center.*

EQUINE INNOVATORS PODCAST: HORSE TRANSPORT AND STRESS



the HORSE PRESENTS EQUINE INNOVATORS PODCAST

It's summer, and many people are transporting their horses more frequently, whether to trail ride or compete. We know long-distance travel stresses our bodies—and our horses'—but what about the shorter trips to a nearby trailhead or to a show venue just a few hours away?

In this [episode](#), Amanda Adams, PhD, MARS Equestrian Fellow and associate professor at the Gluck Equine Research Center, and her graduate student Erica Jacquay, describe new research on how horses of all ages respond to transport—even just 1.5-hour trips across town. They also preview the results of a survey of U.S. horse owners and their trailering practices. We talk about:

- How transport is the most stressful event in a horse's life besides weaning.
- Adams' star herd of senior and juvenile horses and their important roles in this research.
- How Adams and Jacquay measured stress levels in these horses before and after transport.
- What they are learning from a survey of owners transporting their horses short distances.
- What you must keep in mind if you're shipping a horse to the veterinarian for endocrine function tests (as in pituitary pars intermedia dysfunction, or equine Cushing's).
- What types of field studies might be ahead, considering variables such as tying horses versus leaving them loose in the horse trailer.

Listen to the podcast [here](#). You can find Equine Innovators on TheHorse.com, Apple Podcasts, Spotify, Stitcher and Google Podcasts.



PHOTO COURTESY ERICA JACQUAY.

PASTURE RENOVATION IMPROVES FORAGE QUALITY FOR SCHOOL'S HORSES

Horses at a Central Kentucky career and technical high school have lush paddocks to graze on this school year thanks to help from the University of Kentucky College of Agriculture, Food and Environment.

Locust Trace AgriScience Center is a school in Lexington that introduces high school students in Fayette and Woodford counties to many agriculture disciplines. Equine science is one of the more popular areas. During the school year, horses on loan to the school graze the four on-campus paddocks when they are not interacting with students. But with more horses than paddocks, the fields were overgrazed, and it was time to improve them.

“Last year, I served as the farm manager, and I knew these paddocks were pretty thin on forages for our horses,” said Nicki Jones, Locust Trace co-op facilitator. “With no students being on campus, we saw it as the prime opportunity to call on the people at the University of Kentucky to walk us through a renovation.”

The school contacted Krista Lea, MS, UK Horse Pasture Evaluation Program coordinator, and Jimmy Henning, PhD, UK forage extension specialist. They advised school personnel to kill out the existing vegetation and guided them through reseeding the pastures and managing them for the future.

Lea suggested they reseed the paddocks in a tall fescue that could handle the high grazing pressure. Through a donation from Pennington Seed, they secured Lacefield Max Q II, a tall fescue variety developed at UK that contains a novel endophyte. The novel endophyte allows animals to graze



A HORSE GRAZES ON A NEWLY RENOVATED Paddock AT LOCUST TRACE AGRISCIENCE CENTER IN LEXINGTON. PHOTO BY KATIE PRATT, UK AGRICULTURAL COMMUNICATIONS.

the grass without having adverse health effects. Gabriel Roberts, UK field technician, helped the school sow the grass seed.

“I like the fact that I can look out and I can see that the horses we have are on good grass,” said Fallon Jackson, Locust Trace equine sciences instructor. “They are getting what they need, and I don’t have to worry about body condition scores going down because the forage that they are eating is not good enough.”

Lea continues to advise the school on ways to use pasture rotation to give the pastures ample time for recovery and regrowth.

“Each pasture will have a fair number of horses on it with pretty high grazing pressure for a couple of weeks. Then the horses will be rotated off for two to four weeks, and hopefully that will give the pastures plenty of time to regrow,” Lea said. “Even though they are going to have high grazing pressure, by using good management, a dry lot and even feeding some

hay in stalls, they should be able to maintain it reasonably well. “The new grass also will provide teaching opportunities on the importance of quality forages to equine health.

“I think it will be a good opportunity to teach the students about the importance of rotation and not overgrazing and that what you do in the wintertime is going to affect what happens in the spring,” Jones said.

| *Katie Pratt is an agricultural communications specialist within the UK College of Agriculture, Food and Environment.*

UK'S EQUINE SCIENCE REVIEW WINS NEWSLETTER CATEGORY AT 2022 AMERICAN HORSE PUBLICATIONS ANNUAL MEETING

UK Ag Equine Programs Equine Science Review: Highlighting Research & Outreach Efforts at the University of Kentucky won top honors at the 2022 American Horse Publications' annual media awards competition. The Equine Science Review won in the newsletter business category.



CONVERSION OF TOXIC TALL FESCUE TO NOVEL ENDOPHYTE TALL FESCUE

Successful conversion from toxic KY-31 to novel endophyte tall fescue begins much earlier than most people anticipate. Seedheads need to be clipped before maturation, the existing stand needs to be sprayed out in July/August and reseeding needs to be in early September. Check out this simple checklist below for how to make the transition this summer and fall.



PHOTO COURTESY UK COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT.

REPLACEMENT PROTOCOL

Spring

Soil sample; adhere to lime and fertilizer recommendations

1. Take soil sample in May.
2. Follow recommendations in soil test.

Remove/prevent all tall fescue seed heads in the spring via mowing or early hay cutting

1. Clip/mow the pasture in early May as low as possible.
2. Clip/mow the pasture a second time in late May to remove tall fescue seed heads (Note: Fescue seed can be viable 15-20 days after pollination and then germinate in the fall).

Mid-Late Summer

Herbicide spray to kill out existing stand before planting novel endo-

phyte tall fescue or other forages

1. Graze tall fescue heavily during periods of growth.
2. Stop grazing and allow tall fescue to regrow to five to six inches in height.
3. Spray with glyphosate four to six weeks before planting – mid to late-July.
4. Allow weeds and toxic tall fescue to germinate or re-grow from escapes.
5. Re-spray glyphosate before planting – early September

Early-Fall

Plant novel endophyte tall fescue seed

1. In early to mid-September, just after last weed spray, plant a novel tall fescue variety using a no-till seed drill.
2. No-till drill at 20 lbs/ac, and ¼ inch deep. To achieve better

ground cover, set drill at 10 lbs/ac and go over field twice, the second pass perpendicular to the first pass.

Late Fall or early next Spring

Tall fescue seedling management

1. Low rates of N can be used to enhance stand establishment (~40 lbs/N/ac)
2. After planting, wait until tall fescue seedlings reach the 4-leaf stage (4 to 5 inches tall) before weed control.
3. If needed, apply Weedmaster (2,4-D and dicamba) or similar herbicide to control broadleaf weeds.
4. Allow good sod development before grazing next spring. Ideally, wait until plants are 8 inches tall and flash graze (a large number of animals for half a day) or mow at 4 inches residual height or simply cut for hay in the spring (4 inch stubble height).

| *S. Ray Smith, PhD, professor and forage extension specialist, and Krista Lea, MS, Horse Pasture Evaluation coordinator, both of the UK Department of Plant and Soil Sciences, provided this information. Source: KY Forage News, June 1, 2022.*

DON'T LOSE SLEEP OVER FALL ARMYWORMS

Last year, Kentucky was one of the many states impacted by a historic outbreak of fall armyworms. Much of the eastern U.S. was eaten up by these hungry, hungry caterpillars with lawns and fields on the menu. While things eventually settled down and areas have been renovated, you can sense tension in the air this year with many wondering if it will happen again.

The short answer is that we (UK entomologists) do not anticipate 2022 featuring the same level of pest pressure as last year. That being said, there are reasons to keep your eyes and ears open to see if things change.

Fall armyworm does not overwinter in Kentucky. Its usual winter hangouts are in southern Florida and southern Texas. These spots stay warm enough for them to persist and then mate to start the generations that will migrate northward. They usually move from these areas into states like Mississippi and Alabama in April and May, arriving next in Tennessee by May or June. Typically, they start to appear in Kentucky by June.

UK entomologists trap for pests like the fall armyworm using pheromone traps in Princeton and Lexington to help us track their arrival. In 2020, the first captures occurred June 14. In 2021, our first indicator that something would be amiss was that adults were first captured May 7, over a month earlier than usual. As of June 7, 2022, we have not yet captured migrating adult fall armyworms in Princeton or Lexington.

Because of the lack of adults here, we feel that this year should be more normal when compared to last year. We checked in with Katelyn Kesheimer, PhD, assistant

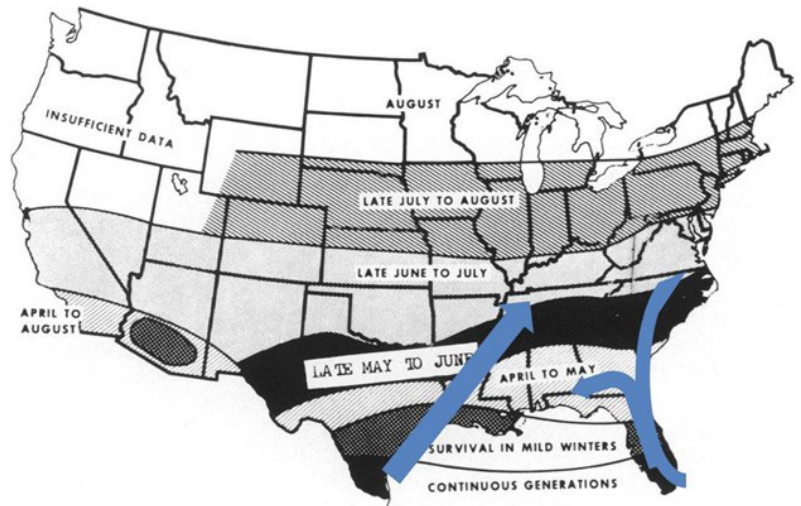


FIGURE 1: HISTORICALLY, FALL ARMYWORM MIGRATION STARTS IN THE DEEP SOUTHERN TIPS OF FLORIDA AND TEXAS. BY LATE JUNE SUCCESSIVE GENERATIONS WILL HAVE MIGRATED TO KENTUCKY. (GRAPHIC ADAPTED FROM: SPARKS, A. 1979. A REVIEW OF THE BIOLOGY OF THE FALL ARMYWORM. FLA. ENTOMOL. 62(2):82-87)

professor and extension specialist, Auburn University, about fall armyworm pressure there and she shared a photo of an egg mass taken last week (June 7), which lines up with our more normal timeline of events. She did share that numbers seemed above average but that they were nowhere near what she recorded in 2021.

Alfalfa growers and other agricultural managers that deal with this pest on an annual basis should prepare and act as they normally do.

Turf managers on the other hand, should not worry about the same level of damage occurring to lawns, sports fields, parks, and golf courses that we saw in 2021. If turf managers have used chlorantraniliprole (sold as Acelepryn or Scott's GrubEx most often) for grub control, their turf will be protected from possible fall armyworm problems as well. If an imidacloprid or clothianidin application was made for grubs instead, then watch for information coming out in the next month about

moth arrival in Kentucky and the anticipated caterpillar pressure. Depending on the next sequence of events, a treatment with cyfluthrin, lambda-cyhalothrin or bifenthrin could limit caterpillar problems. But, to prevent pesticide waste and a crunch on your budget, don't treat now for a pest we may not deal with.

| Source: Jonathan Larson, PhD, assistant extension professor, UK College of Agriculture, Food and Environment Department of Entomology, from Kentucky Pest News, June 14, 2022

RESEARCH TEAM AWARDED GRANT TO INTEGRATE LIVESTOCK PATHOLOGY REPORTS FOR IMPROVED BREEDING

A research team led by **Theodore Kalbfleisch, PhD and faculty member in the University of Kentucky's Gluck Equine Research Center**, was recently awarded a grant from the Agricultural Genome to Phenome Initiative (AG2PI) to create a service that can integrate pathology reports of aborted pregnancies in sheep, cattle and horses for use among breeders and the scientific community.

The project is one of nine seed grants awarded by AG2PI involving 27 institutions around the globe in the third and final round of grant competition. Awarded grant projects will address issues related to agricultural genome to phenome research such as developing solutions for research infrastructure needs and identifying opportunities for cross-kingdom synergies.

Funded by the U.S. Department of Agriculture's National Institute of Food and Agriculture, AG2PI is a three-year project ending in 2023. The goal of AG2PI is to connect crop and livestock scientists to each other and to those working in data science, statistics, engineering, and social sciences to identify shared problems and collaborate on solutions.

The Seed Grants span three levels of funding: emerging grants, enabling grants and establishing grants. Award amounts range from \$50,000–\$100,000, depending on the grant type and associated funding level. The projects begin in June and will run from six to 12 months.

Kalbfleisch will work with three groups of collaborators from five universities, including:



Agricultural Genome to Phenome Initiative

- Fiona McCarthy, University of Arizona
- Elaine Norton, University of Arizona
- **Jennifer Janes, University of Kentucky**
- Jessica Petersen, University of Nebraska-Lincoln
- David Steffen, University of Nebraska-Lincoln
- Brenda Murdoch, University of Idaho
- Darren Hagen, Oklahoma State University.

The team will collaborate on the Enabling Grant project, “A Genetic Data Portal to Enable Discovery of Deleterious Genetic Variants in Farmed Animals.” They intend to create a data management system that will integrate pathology reports as well as sequencing, analyzing and publishing data for aborted pregnancies in farm animals with no known causes. By having this information sharable, it could improve successful breeding opportunities for other researchers and animal scientists.

“We have gotten very good at being productive with high throughput genetic data in a research setting,” Kalbfleisch said. “The aim of this project is to build a conduit for producers and clinicians to submit samples, have them analyzed in a context of all existing genetic knowledge for the

respective species and breed, and have the results of these analyses reported back to them for productive use in their practices and breeding programs. It is an opportunity to tighten the feedback loop between animal scientists and animal producers, and we are excited for it.”

“The projects awarded in this final round of our seed grant program provide a clear illustration of the AG2PI project’s success,” said Patrick Schnable, AG2PI lead Principal Investigator and distinguished professor at Iowa State University. “Over the last year, AG2PI has awarded 27 seed grants for research projects, totaling \$1.1 million and involving more than 50 institutions, making an impact across the country. Many multi-disciplinary and multi-institutional collaborations are being enabled by these seed grants supported by USDA NIFA.”

For more information on the three rounds of seed grant projects as well as other grant opportunities, visit this [webpage](#).

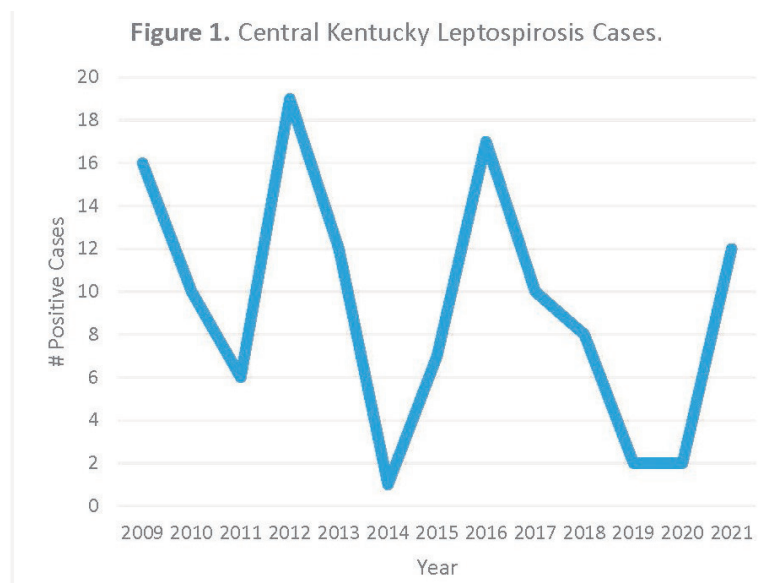
The AG2PI is funded by the U.S. Department of Agriculture’s National Institute of Food and Agriculture. The goal of AG2PI is to build communities that address the challenges of genome-to-phenome research across crops and livestock. The AG2PI partners include Iowa State University, University of Nebraska, University of Arizona, University of Idaho and the Iowa Corn Promotion Board.

| *Source: edited news release from AG2PI*

EQUINE LEPTOSPIRAL ABORTION IN CENTRAL KENTUCKY

Leptospire are zoonotic bacteria of worldwide distribution. Adult horses acutely infected with *Leptospira* develop clinical signs associated with acute liver and kidney failure. Additionally, a strong association has been identified with equine recurrent uveitis and leptospiral infection. In general, clinical signs of infection coincide with the bacteria's natural tropism to target and replicate within the bile tract, kidneys, blood, placenta and eyes. Animals are most commonly infected through contact with water or soil that has been contaminated with urine from an infected carrier animal, either through drinking a contaminated source or through open wounds. Leptospire can persist in the environment for weeks to months post exposure, which makes disease prevention and environmental control difficult. Infection of pregnant mares can result in abortion, stillbirth or birth of a weak foal.

Since 2009, the University of Kentucky Veterinary Diagnostic Laboratory (UKVDL) has diagnosed 122 cases of equine leptospirosis in fetuses or neonates. This represents roughly 1.8% of the total number of fetal cases submitted to the UKVDL during this time period. On average, the UKVDL diagnoses nine cases of leptospiral abortion a year, but yearly cases can range from one to 17. An increased incidence of leptospiral abortion can occur in years with heavy rainfall in the late summer and fall. Therefore, the incidence of leptospiral abortion and nocardioform placentitis can be inversely related. Of the 122 cases, 80% were diagnosed in Thoroughbreds and 6.5% were



diagnosed in Standardbreds, which directly mirrors the breed distribution in central Kentucky.

Leptospirosis commonly causes abortions during mid to late fetal gestation. Submissions to the UKVDL ranged in gestational age from 5 to 11 months, with an average gestational age of 8.59 months. Grossly, fetal and placental lesions can vary. When present, the most common gross lesions associated with abortion are icterus, an enlarged mottled yellow liver, petechial hemorrhages within the placenta and/or fetal mucous membranes and placentitis. Microscopic lesions include placentitis, hepatitis and nephritis. The organism is typically visible within the fetal and placental tissues using a silver stain or immunohistochemistry.

Leptospira is a large genus of bacterial organisms of which *Leptospira interrogans* is the most important in humans and animals. *Leptospira interrogans* has multiple serovars and specific serovars more commonly cause clinical disease in different domesticated animal. In horses, the serovars that

have been reported to cause abortion are Pomona, Grippotyphosa, Icterohaemorrhagiae, Kenewicki and Bratslava. Currently, Pomona is the most frequent serovar associated with abortion in Kentucky.

At the UKVDL, a combination of diagnostic tests is used to aid in the diagnosis of leptospiral abortion. Currently, the two most commonly utilized tests by UKVDL veterinary pathologists are the microagglutination test (MAT) and real-time polymerase chain reaction (q-PCR) assay. MAT testing is commonly performed on fetal heart blood or pericardial fluid and yields a titer indicating the fetus was exposed to leptospire during gestation. MAT is a highly sensitive test with relatively low specificity. In adult animals sequential MAT titers are utilized and a greater than fourfold increase in serial titers indicates recent infection in an unvaccinated animal. In fetal tissues, any MAT titer is considered significant. Of the 122 cases, 96.7% of the cases had a positive MAT titer and 90.4% of these cases had a positive MAT

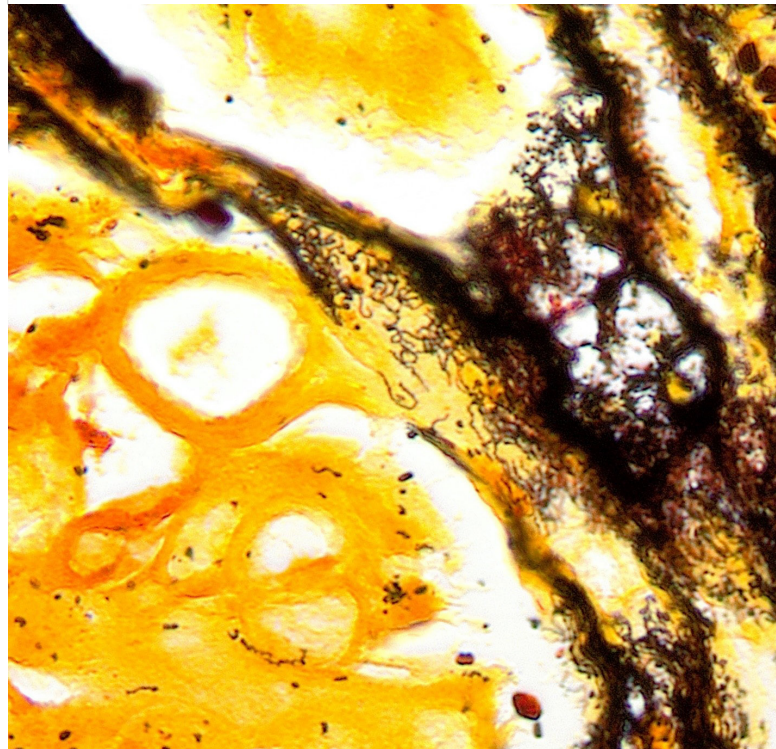
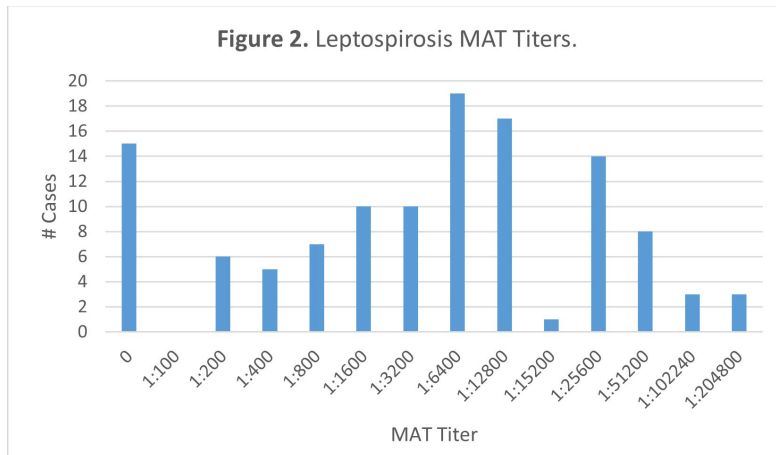


FIGURE 3. NUMEROUS LEPTOSPIRES ARE LOCATED WITHIN THE PLACENTAL STROMA. LEPTOSPIRES ARE BLACK AND HAVE A CORKSCREW TO WHIP SHAPE.

titer for either serovars Pomona or Grippotyphosa. Fetal titers ranged from 1:200 to 1:204,800 with the most frequent titer being 1:6,400. Most commonly, MAT titer results will be confirmed with either histologic lesions and a qPCR test. In 2012, the UKVDL implemented a qPCR assay for the detection of leptospires. PCR is a highly sensitive and specific diagnostic assay in which a positive result indicates the presence of the bacterial DNA within the sample. Of the 122 fetal abortions, 44 of these cases were qPCR tested and 95% of these cases tested positive via PCR analysis.

In conclusion, leptospiral abor-

tions represent an important cause of equine abortion in central Kentucky. Cases of leptospiral abortion are detected each year and farm personnel should be aware that the aborted fetal tissues and mare urine are infectious to other horses and pose a health risk to people coming in contact with them.

| *Melissa Swan DVM, MS, Dipl. ACVP Assistant Professor of Veterinary Pathology University of Kentucky Veterinary Diagnostic Laboratory. Source: April 2022 Equine Disease Quarterly*

EQUINE INNOVATORS PODCAST: DOES HOW YOU MANAGE YOUR HORSE FARM MAKE SENSE?



As horse owners, we have our rhythms and routines around the barn. But why do we do farm chores the way we do them, and could we—and our horses—benefit from changing our approaches?

In this episode Steve Higgins, PhD, director of animal and environmental compliance for the University of Kentucky's Agricultural Experiment Station, College of Agriculture, Food and Environment, describes ways horse farm owners and managers can optimize daily horse farm tasks for efficiency, cost-savings and environmental soundness.

Listen to the podcast [here](#).



About the researcher: During his time at UK, Higgins has helped establish the university's College of Agriculture, Food and Environment as a leader in animal welfare and environmental stewardship and has cultivated a new way of thinking for managing UK's Experiment Station farms. Through his extension publications, presentations and demonstrations throughout the state, Higgins shares his unique perspective and working knowledge of water quality, farm efficiency and resource management issues with Kentucky landowners and farm managers.

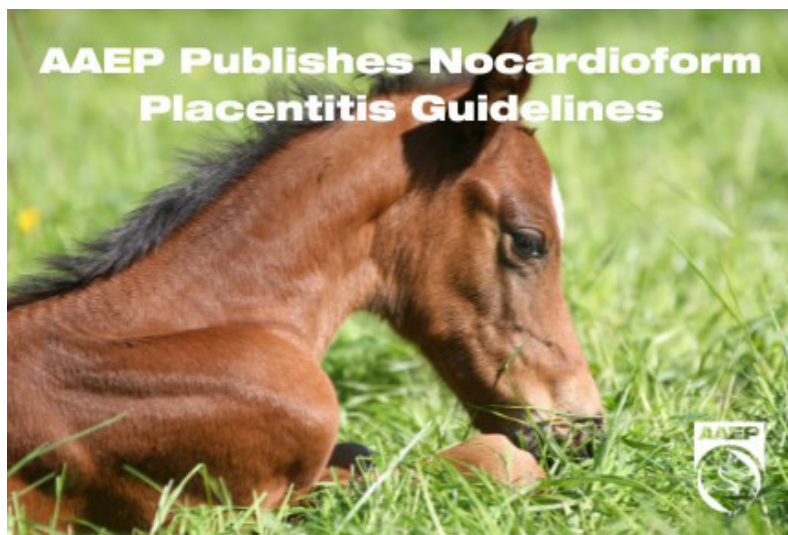
AAEP PUBLISHES NOCARDIOFORM PLACENTITIS GUIDELINES

Equine veterinarians can help protect their clients' broodmares and unborn foals from nocardioform placentitis (NP) with new disease guidelines published by the American Association of Equine Practitioners. The AAEP's Nocardioform Placentitis Guidelines present the clinical features, risk factors, treatment, control measures and more for a form of bacterial placentitis that can cause abortion, stillbirth, or delivery of a weak premature or term foal.

NP was first diagnosed in central Kentucky in the mid-1980s, and its occurrence since has varied from sporadic cases to outbreak years in the region. Outside of Kentucky and the United States, NP has been reported primarily as isolated cases and rarely as outbreaks. The suggested window from exposure to clinical signs is generally three to five months. In addition, there is a strong association between weather conditions during mid- to late-pregnancy and increased occurrence of NP, specifically exposure to low rainfall and high temperatures during August and September in central Kentucky.

"The insidious nature of NP makes the early diagnosis and onset of treatment rather challenging in clinical practice," said guidelines co-author Igor Canisso, DVM, MS, Ph.D., DACT, DECAR (equine reproduction), associate professor of theriogenology at the University of Illinois College of Veterinary Medicine.

Attempts to create experimental NP infection have been unsuccessful, limiting evidence-based assessment of therapy efficacy. Currently, mares suspected to have NP based on ultrasonographic



lesions are usually empirically treated with antibiotics (e.g., sulfa, doxycycline, or gentamicin), anti-inflammatories (flunixin or firocoxib), steroids (altrenogest and/or estrogens) and supporting medications (pentoxifylline and vitamin E).

Canisso co-authored the Nocardioform Placentitis Guidelines with Maria Schnobrich, VMD, DACT, shareholder and theriogenologist at Rood & Riddle Equine Hospital; Carleigh Fedorka, PhD, postdoctoral fellow at the University of Kentucky's Maxwell H. Gluck Equine Research Center; and Barry Ball, DVM, Ph.D., DACT, who recently retired as the Albert G. Clay Endowed Chair and Professor in Equine Reproduction at the Gluck Center.

View the Nocardioform Placentitis Guidelines or save them to your mobile device as a PDF file at <https://aaep.org/document/nocardioform-placentitis>. Besides Nocardioform Placentitis, AAEP guidelines for 23 additional equine infectious diseases can be found at

<https://aaep.org/guidelines/infectious-disease-control/using-guidelines>. In addition, five foreign animal disease guidelines are available at <https://aaep.org/infectious-disease-control/foreign-animal-disease-guidelines>.

Info for [NP](#).

ABOUT AAEP

THE AMERICAN ASSOCIATION OF EQUINE PRACTITIONERS, HEADQUARTERED IN LEXINGTON, KY., WAS FOUNDED IN 1954 AS A NON-PROFIT ORGANIZATION DEDICATED TO THE HEALTH AND WELFARE OF THE HORSE. CURRENTLY, AAEP REACHES MORE THAN 5 MILLION HORSE OWNERS THROUGH ITS OVER 9,000 MEMBERS WORLDWIDE AND IS ACTIVELY INVOLVED IN ETHICS ISSUES, PRACTICE MANAGEMENT, RESEARCH AND CONTINUING EDUCATION IN THE EQUINE VETERINARY PROFESSION AND HORSE INDUSTRY.

| *Source: Edited news release.*