

# New Technology Speeds Animal Disease Diagnosis



Erica Phillips prepares targets for MALDI-TOF.

**T**ime can make all the difference in animal disease diagnosis. Early diagnosis can protect herd health, give veterinarians more choices, and save lives.

For many diseases, it's a waiting game to pinpoint the exact bacteria causing the problem. Traditional diagnostics rely heavily on culturing bacteria in old-school petri dishes. That's still a tried-and-true method, but now scientists at the University of Kentucky College of Agriculture, Food and Environment's Veterinary Diagnostic Lab are hailing a new technology as a game changer for Kentucky animal health.

MALDI-TOF, formally Matrix Assisted Laser Desorption/Ionization-Time of Flight, has been used in human medicine for years. Now, veterinary labs across the country are using the technology to help identify bacteria.

"Let's say a dog is sick; it's having respiratory distress," said Erdal Erol, DVM, PhD, UKVDL microbiologist. "The veterinarian wants to know how to treat the animal, so he or she sends us a sample. We grow the bacteria for 24 to 48 hours. Then we place the bacteria on a target, use the MALDI-TOF machine, and we can give them an almost immediate answer."

One metal-plate target can hold as many as 48 isolated bacteria. The scientist places the target at a slight angle at the bottom of the machine. The machine creates a vacuum and fires a laser at each sample to ionize the bacteria. Then it's a race up the machine's tube to determine the time of flight to the top. Obviously, heavier, bigger ions travel slower, and smaller ions travel faster. The machine measures highly abundant proteins, present in all microorganisms, and compares the results with the samples in the database to identify the bacteria.

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"In about 25 minutes we can get an answer that takes several days with traditional biochemical processes," said Erica Phillips, UKVDL research analyst. "Traditionally, you grow the bacteria, wait 24 to 48 hours to look at your plates, and see some bacteria growth. Then we'd begin other tests that can take up to 48 hours more."

In many cases, the animal does not receive treatment until the lab identifies the bacteria. The longer the animal has to wait, the more it suffers and the chance of disease spread increases. With MALDI-TOF, "they can go ahead and find out what we think is significant and begin treatment; several days can make a big difference," Phillips said.

Occasionally, the MALDI-TOF machine returns no reliable results because it can't find the bacteria in the database. At this point, Phillips can fall back on traditional methods.

"We may see many things here in Kentucky that they don't see other places around the country," she said. "But that's an opportunity also, because we save many samples that the machine doesn't identify, and we will be able to add to the database at some point, so that particular bacteria or strain can be available to other scientists across the United States."

Erol said the technology is currently only used to identify bacteria, but might help scientists diagnose other animal pathogens in the future. **UK**

>Aimee Nielson is an agriculture communications specialist in the College of Agriculture, Food and Environment.

## Horohov Named Chair of UK Veterinary Science, Director of Gluck Equine Research Center

The University of Kentucky College of Agriculture, Food and Environment has named David Horohov, PhD, chair of the Department of Veterinary Science and director of the Gluck Equine Research Center. His appointment will begin Sept. 23.

"We are extremely happy that David has joined the administrative team on a permanent basis," said Nancy Cox, MS, PhD, dean of the College of Agriculture, Food and Environment. "We are fortunate to have someone of his distinguished research reputation at the helm of this important department. Even more important, David's dedication to supporting Kentucky's signature industry promises a focus on relevant research with high impact."

Horohov has served as the interim chair of the Department of Veterinary Science and the interim director of the Gluck Equine Research Center since September 2014. A professor and Jes E. and Clementine M. Schlaikjer Endowed Chair, Horohov specializes in equine immunology research. He joined the Gluck Center in 2003. Previously, he was a professor of veterinary immunology within the Department of Pathobiological Sciences at Louisiana State University's School of Veterinary Medicine.

Horohov earned his bachelor's degree in entomology from Penn State University, his master's in insect pathology from Purdue University, and his doctorate in immunology from the University of Tennessee, Knoxville. He completed a post-doctorate in cytokine biology with the Food and Drug Administration.

"I am humbled and excited by this opportunity I have

been given to be the chair of the Department of Veterinary Science and the director of the Gluck Equine Research Center," Horohov said. "I truly believe that this program offers exceptional opportunities, and I hope to continue our successes and accomplishments during my tenure as chair. I greatly appreciate the support I have received from Dean Nancy Cox, the faculty, and our stakeholders. I very much look forward to working with all of them, as we move this program forward."

He will oversee the department's three entities—the Animal Genetics Testing and Research Laboratory, the Gluck Equine Research Center, and the Veterinary Diagnostic Laboratory.

The Department of Veterinary Science's mission is to assure the health and viability of animal agriculture through teaching, discovery, research, and service.

The mission of the Gluck Center, a UK Ag Equine program in the College of Agriculture, Food and Environment, is scientific discovery, education, and dissemination of knowledge for the benefit of the health and well-being of horses. The Gluck Center faculty conducts equine research in six targeted areas: genetics and genomics, infectious diseases and immunology, musculoskeletal science, parasitology, pharmacology/toxicology, and reproductive health.

For more information on the Department of Veterinary Science, visit [ca.uky.edu/gluck](http://ca.uky.edu/gluck). **UK**

>Jenny Evans, MFA, is the interim executive director of the Gluck Equine Research Foundation and the marketing/promotion specialist senior of the Gluck Equine Research Center.



MATT BARTON

ALEXANDRA BECKSTETT



Never feed moldy hay to horses.

## Timely Topic: A Connection Between Moldy Hay and Heaves

Horse owners know you can't underestimate the power of being prepared. As such, most of us start to stock our winter hay supply in the summer, which is also the time when producers are harvesting and putting up new hay. According to the National Weather Service, Central Kentucky experienced higher-than-average rainfall in the early summer months of 2015 (especially in April, May, and June). While that amount of rain, combined with warm spring and summer temperatures, allowed for green pastures, it also posed a significant challenge for hay producers.

Much of the hay produced this year might have been put up with a higher degree of moisture concentration and, therefore, is at risk of becoming moldy. Never feed moldy hay to horses, as it can cause several respiratory problems, the most important of which is heaves. Heaves is a chronic performance-affecting respiratory disease in horses that begins as an allergic reaction to eating moldy hay and breathing in other organic particulates.

We suggest you pay close attention to your hay and dispose of any moldy bales you find. While it might be too late to test your summer-purchased hay for moisture content, you can invest in a hay moisture tester for future hay purchases, so you never again have to buy hay that was baled too wet.

The following University of Kentucky publication provides more information about heaves: <http://www2.ca.uky.edu/agc/pubs/asc/asc172/asc172.pdf>. **UK**

>Fernanda C. Camargo, DVM, PhD, associate professor and equine Extension specialist in the University of Kentucky College of Agriculture, Food and Environment's Department of Animal and Food Sciences, provided this information.

## Bennie and Cheryllee Sargent Named 2015 Friend of UK Ag Equine Programs

There are friends, and then there are longtime friends—the kind who were friends well before a program ever existed. Bennie and Cheryllee Sargent, who were collectively recognized as the 2015 Friend of the University of Kentucky's Ag Equine Programs during its Equine Science and Management program reception Sept. 8 at Spindletop Hall, are those longtime kinds of friends.

Based out of Paris, Kentucky, the Sargents of Sargent Quarter Horses have been supporting UK's equine programming efforts for nearly 20 years, from Bennie serving as coach of the UK Equestrian Team, western division, to the couple hosting and helping with numerous 4-H activities and extension programs.

"UK's equine program is unique across the country because of where we are located and the great support we receive from industry professionals like Bennie and Cheryllee Sargent," said Bob Coleman, PhD, director of undergraduate studies in Equine Science and Management and equine extension professor. "They are truly our friends, and it is great to have them recognized for all they do."

Coleman, who also serves as UK Equestrian Team faculty adviser, nominated the couple for the honor.

The Sargents have helped raise Kentucky's profile in the world of American Quarter Horses through their years of service to the Kentucky Quarter Horse Association. Bennie has been a successful trainer for more than 35 years and was named the 2006 AQHA Horseman of the Year. He has trained and shown horses to multiple versatility championships, AQHA championships, and Honor Roll honors in several events including halter, reining, working hunter, and trail.

"We benefit greatly from the willingness of some of the best people in the industry to invest in our students and



MATT BARTON

Bennie and Cheryllee Sargent were recognized as the 2015 Friend of UK Ag Equine Programs.

our program," said Jill Stowe, PhD, director of UK Ag Equine Programs and associate professor in agricultural economics. "Bennie and Cheryllee Sargent have exemplified that generosity over many years by sharing their knowledge and expertise with our students, along with youth in general. They are investing in the industry's leaders of tomorrow, and we are so appreciative of their support."

Western Equestrian Team student president AnnMarie Kadnar wrote a letter supporting the Sargents' nomination, thanking the couple for giving their time to the student riders on the team, both in practices and in devoting many weekends to team competitions. In addition, she expressed appreciation for the expertise they have shared over many years and in the generosity Bennie exhibits by letting riders use his personal horses for practice and competition. Cheryllee got special recognition for providing students home-cooked meals several times a semester and for ensuring that UK's shows routinely offer prizes that are the envy of other programs.

Coleman said the Sargents have supported the 4-H Horse Program for nearly 20 years, from supplying horses for judging contests to giving horse judging clinics to youth. In collaboration with extension personnel at UK, the Sargents installed high-traffic pads at their previous Georgetown facility to

## Masthead

### University of Kentucky Ag Equine Programs

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### The Horse: Your Guide to Equine Health Care

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## STUDENT SPOTLIGHT

### CHARLOTTE HANSEN

**From:** Falls Church, Virginia

**Degree and institute where received:**

**BS in Geography and a minor in Agricultural Economics, Virginia Tech, 2008**

**Currently working on MS in Agricultural Economics from the University of Kentucky**



Charlotte Hansen chose to attend the University of Kentucky for her master's degree after a former advisor from Virginia Tech told her she should apply to UK to focus her studies on the equine industry. Taking that advice to heart, she contacted Jill Stowe, PhD, director of UK Ag Equine Programs and associate professor of agriculture economics at UK, a few years ago with some general questions about focusing her studies on agricultural economics with an equine emphasis.

When the time was right, and after a few e-mail conversations over the years, Hansen came to UK to pursue her degree in agricultural economics and said she believes this is the best decision she has ever made. Not only is she pursuing her degree and working with wonderful faculty, she is also able to experience the horse industry firsthand while working on an equine-oriented thesis.

"This is the breath of fresh air I needed to pursue my equine dreams," Hansen said.

Hansen's current research with Stowe focuses on the economic considerations of different treatment strategies for the equine influenza virus. Zoetis Inc. funds the research. When the first symptoms of post-flu exposure occur, horse owners and managers have the option of delaying treatment to see whether a secondary bacterial infection occurs or to treat aggressively at the outset to potentially ward off any secondary bacterial infections. The economic considerations of the "treat now" versus "wait and see" alternatives include explicit treatment costs as well as nonmonetary costs the owner or manager bear when caring for an ill horse. The first part of the study collects data from field practitioners to estimate the cost of treatment strategies under different scenarios. The second part consists of a questionnaire presented to horse owners and managers and includes four questions regarding alternative treatment strategies. The treatment strategies vary depending on the length of time the horse is ill, his appetite, and cost of treatment. This conjoint analysis (how people value different attributes) approach allows Hansen and Stowe to estimate respondents' willingness to pay for different elements of a treatment strategy.

This research is important to the equine health care field because it provides preliminary information about the decision-making process of one of the horse's most important caregivers—its owner or manager. In other words, what factors impact health care decisions that owners make for their horses? Are they price-sensitive? Are they willing to pay to avoid loss of training time or even to avoid seeing their horse feel poorly? Using this research, pharmaceutical companies and veterinary practitioners can better understand what drives the health care decisions horse owners and managers make for their horses.

In addition to her thesis research, Hansen is in the process of submitting an article for publication about the determinants of stud fees for the first five years of a sire's breeding career. This paper, which is in collaboration with Stowe and Sayed Saghaian, PhD, associate professor of agricultural economics at UK, estimates the determinants of freshman sire stud fees and the factors that adjust a stud fee's value as more information about his quality becomes available. Results from this study are useful for breeders and stallion managers in making pricing and purchase decisions. Hansen's future work at UK includes teaching geographic information systems (to utilize her geography degree) to students and park rangers in Africa to better handle illegal activities such as poaching and illegal grazing or fishing.

Hansen will graduate within two years. She said her time here has flown by, and research is not as scary as she originally thought. Hansen believes the networks she has formed will stay with her and that research is continually evolving and leading her forward. After Hansen finishes her degree, she hopes to work in an agricultural field related to equines, disease, and geography, whether in the field of transportation, marketing, or management. **UK**

>Charlotte Hansen provided this information.

### Bennie and Cherylee Sargent

alleviate the footing problems associated with highly concentrated horse traffic, a problem many horse owners face. University experts documented that process and have used it to showcase best practices in managing high-traffic areas.

"Bennie and Cherylee have opened up their farm, horses, and their hearts to UK. You don't visit Bennie's farm without seeing UK students learning horsemanship and training," said Nancy Cox, PhD, dean of the College of Agriculture, Food and Environment. "I visited recently when our own UK President Eli Capilouto came out for a riding lesson. I watched four or five team members being coached by Bennie, on his own horses. He is a consummate teacher, and there is no greater family deserving of this award."

The Friend of UK Ag Equine Programs was created in 2005, when the program was called the Equine Initiative, to recognize a member of the public who had provided advocacy, funding, or other extraordinary support for the UK College of Agriculture, Food and Environment's equine programs or a college or university employee who had generated an exceptional relationship with stakeholders that manifested into a new program, new advocacy success, or new resources for the program.

Past Friends of UK's Ag Equine Programs include Stuart Brown, DVM, a Lexington-based veterinarian specializing in equine reproduction with Hagyard Equine Medical Institute; Norm Luba, executive director of the North American Equine Ranching Information Council and current chair of the UK College of Agriculture, Food and Environment's Equine Advisory Committee; Dan Rosenberg of Rosenberg Thoroughbred Consulting; Northern Kentucky county extension agent trio Don Sorrell of Campbell County, Dan Allen of Kenton County, and Jerry Brown of Boone County; and David Switzer, former executive director of Kentucky Thoroughbred Association/Kentucky Owners and Breeders Association.

For more information about UK's Ag Equine Programs, visit [www.ca.uky.edu/equine](http://www.ca.uky.edu/equine). **UK**

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



## Your Guide to Horse Hay

### Hay Types

**Grass** The grass family, *Poaceae*, contains many common forages for horses. Grasses are herbaceous (not woody) with parallel leaf veins, fibrous root systems, and will bear seed on an elongated seed stalk.

Grasses can be subdivided into two groups:

**Cool-season** These grasses grow best at temperatures between 60° and 80°F. They're prevalent in the central and northern regions of the United States where cool temperatures and consistent rainfall are common. Examples include smooth brome grass, tall fescue, Kentucky bluegrass, orchardgrass, and timothy.

**Warm-season** These grasses grow best at temperatures between 85° and 95°F, and they thrive in the south where high temperatures are common. Warm season grasses use water more efficiently and generally yield more than cool season grasses, although protein values are often lower. Bermudagrass is a common warm season grass.

Some grasses have been bred for seed production and are now commonly called cereal grains. These grasses, such as oat, wheat, rye, and barley, are usually harvested for grain (seed), and the remaining stubble can be used for straw. However, if harvested at an earlier stage, these grasses can also make good hay for horses and other livestock. Most cereal grasses are cool season grasses.

**Legume** Legumes are members of the *Fabaceae* family; they have a netted leaf venation, produce seed in a pod, and usually have a taproot system. Legumes can also be subdivided into warm and cool season plants. They can interact

with the bacteria *Rhizobium*, which converts nitrogen from the air into a usable form in the plant. This contributes to the higher protein values often seen in well-managed legume stands. Common legumes for horses include alfalfa and red and white clover.

**Mixed** "Mixed hay" is a common term seen in the commercial hay market. This generally means the hay contains both grasses and legumes, with orchardgrass/alfalfa being the most common mixture. Some grasses, such as bermudagrass and timothy, do not grow well in mixtures. Many grass hays are sold as a mixture of several grasses, such as tall fescue, orchardgrass, and

Kentucky bluegrass. White clover rarely makes up a significant fraction of hay because yields are very low.

### Common Hay Species

- Alfalfa is the most economically important hay crop to the horse industry. This cool season legume has adapted to a good portion of North America. If well-managed, alfalfa hay is very high in protein and calcium. It is very palatable and digestible to horses.
- Bermudagrass is a warm season grass that is very high yielding and palatable to horses. It is common in the south, and its low protein levels makes it ideal for many classes of horses.
- Clovers are generally cool season legumes with high forage quality and palatability. Red clover is the most common type used for hay due to its high yield. White clover is the most common in pastures but due to low yield is not common in hay.
- Kentucky bluegrass is rarely grown as a pure stand. It is a cool season grass that matures early and is low yielding. As hay, it has a fine texture with low to average protein.
- Oat is usually harvested as a cereal crop, but if harvested in early maturity can be a useful hay for horses. It's of average quality and reasonably palatable to most horses.



### UK at Draft Horse Field Day

The 11th annual U.S. Horse Plowing Competition was held in conjunction with Asbury University's annual Draft Horse Field Day Sept. 5. Educational exhibits there included several from the University of Kentucky. Pictured here is one of the teams at the event.

## Guide to Horse Hay

- Orchardgrass is a very common cool season grass similar to timothy. It has average protein and is very palatable to horses. It also grows well in mixtures, such as with alfalfa.
- Ryegrass is one of the highest quality cool season grasses used for horses; however, it is used in a pasture setting more than for hay. Ryegrass (not to be confused with cereal rye) can also be infected with a toxic endophyte similar to tall fescue, so care should be taken when feeding to pregnant mares.
- Smooth bromegrass is a cool season grass found in northern regions of the United States. It is often higher quality than other cool season grasses and is very palatable.

- Tall fescue is a cool season grass common throughout the southeastern United States. Naturally occurring tall fescue is often rough in texture and can be infected with a fungal endophyte dangerous to pregnant mares. However, newly developed varieties are softer in texture and have reduced or eliminated toxicity. These generally have average protein values and are suitable for many classes of horses.
- Timothy is a cool season grass that is an excellent horse hay. Timothy is soft leafed, making it very palatable. Well-managed timothy will have average protein and fiber levels, making it ideal for many classes of horses.

### Hay Quality

Regardless the type of hay you choose, its nutrient level will depend on its stage of maturity at harvest.

The earlier the maturity, the softer and leafier the hay and the higher its protein and nutrient levels. Early to mid-maturity hays are good choices for horses with higher energy demands, such as lactating mares or young, growing horses.

Late-maturity hays are coarse, stemmy, and have low nutrient levels. These are ideal for adult, idle horses.

Visual and tactile inspection of the hay can give you clues as to the maturity at harvest, but a nutrient analysis performed at a lab will provide you with a more accurate estimate of your hay's nutrient levels, which also vary by region.

### Take-Home Message

Because different horses (growing, breeding, performance, maintenance) have different nutrient requirements, work with a veterinarian or equine nutritionist to determine which type of hay meets your horse's individual needs. **UK**

This piece originally appeared on TheHorse.com/35709, by Alexandra Beckstett, managing editor of *The Horse*. Ray Smith, PhD, professor and forage extension specialist in plant and soil sciences at UK, and Krista Lea, MS, assistant coordinator of UK's Horse Pasture Evaluation Program, contributed.

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## Ambitious Undergrad: Sarah Sivinski

Undergraduate students have the opportunity to pursue research projects at the University of Kentucky's College of Agriculture, Food and Environment. Sarah Sivinski, an undergraduate in Equine Science and Management with a minor in Biology, is taking full advantage of this opportunity.

Sivinski is in the honors program and is required to complete an individual research project. During her sophomore year, she joined the Research in Equine and Agricultural Disciplines (R.E.A.D.) club, which connected her to Kristine Urschel, PhD, assistant professor of equine science.

Through Urschel, Sivinski began her own research project looking at muscle metabolism of horses at various stages of life (yearlings, 2-year-olds, and mature horses 20 years and older) and at

## Sarah Sivinski

different feeding stages. She worked with Sara Mastellar, PhD, instructor at South Dakota State University, to look at AMP-activated protein kinase (AMPK), which inhibits protein synthesis by indirectly inhibiting the mTOR protein pathway as well as activating protein degradation.

The study found that AMPK was not higher in fasted or more mature horses that do not require as much muscle accretion as young horses. The results were not significant but could indicate there are more vital molecules to muscle metabolism or that the study could be repeated with different time parameters.

At the same time as her individual research project, Sivinski began to volunteer for graduate student Caroline Loos in the equine nutrition lab. Urschel hired Sivinski as an intern in the laboratory and on research projects at UK's Maine Chance Farm. As an intern, she took samples, collected and analyzed results, then quantified the data. Sivinski used techniques such as high-performance liquid chromatography, assisted in a

digestive trial, and performed individual research on the Western blot, a technique used to analyze protein sequences.

This summer, Sivinski became a research intern for Ben Goff, PhD, in UK's Department of Plant and Soil Sciences, and worked at Spindletop Farm as well as in a laboratory on campus. In this position she was again able to perform her own studies, but this time she was responsible for the entirety of the research and troubleshooting her own projects. Her research focus was on condensed tannin and ergot alkaloids, but she also helps apply fertilizers, take forage samples, and run equipment.

"I have gained invaluable experience throughout my time as an undergraduate researcher," Sivinski said. "In addition to learning the material, I learned how to conduct experiments, analyze statistical data, comprehend scholarly articles, write professional research papers and abstracts, troubleshoot, manage my time efficiently, speak scientifically and professionally, and lastly, how to accept insignificant results."

As an undergraduate researcher, Sivinski was able to present in the undergraduate competition at the

Equine Science Society meeting in May, a trip funded by Urschel's lab. She also received assistance to attend the American Dairy Science Society-American Society of Animal Science Joint Annual Meeting in July. Both meetings provided opportunities to network with professional researchers and graduate schools, ultimately landing her several opportunities to attend graduate school. These opportunities not only represent the ability to work alongside successful researchers in the equine industry, but also that there is support and opportunity for undergraduate researchers.

After graduation in May 2016, Sivinski will be attending graduate school to pursue a master's degree in agricultural research and potentially a doctoral degree after that. Sivinski plans to pursue a career in academia as a professor, extension agent, or researcher, but she is also interested in industry animal health and nutrition. **UK**

>Hannah Forte is a communication intern with the UK Ag Equine Programs and Gluck Equine Research Center and undergraduate student majoring in community and leadership development at UK.

## Q&A: Preventing Hay Fires

**Q** As several hay fires and the loss of barns and other property made the news recently, an inquiry came into the UK Ag Equine Programs office: What information is available about the prevention and control of hay fires? Can that information be made available publicly?

**A** According to Ray Smith, PhD, professor and forage extension specialist at the University of Kentucky, and a publication he helped author while he was a faculty member at Virginia Tech University, hay moisture concentration has a major effect on the microbial activity that can lead to hay fires.

Smith said producers should cure hay to the proper

moisture concentration prior to baling—a concentration of 20% or less for small rectangular bales and 18% or less for large or round bales. (Note, however, that experts caution that a moisture concentration greater than 16.5% in square bales puts those bales at a greater risk of mold during storage).

Many of the hay fires that occur happen within six weeks of baling, when hay spontaneously combusts. Kentucky and several states in the Southeast had a wetter-than-average late spring, which affected many farmers' hay baling schedules as well as the quality of some of the hay that was put up.

While the threat of hay fires is often greater in the late spring and early summer months, it can affect

hay storage anytime hay is put up with high moisture concentrations.

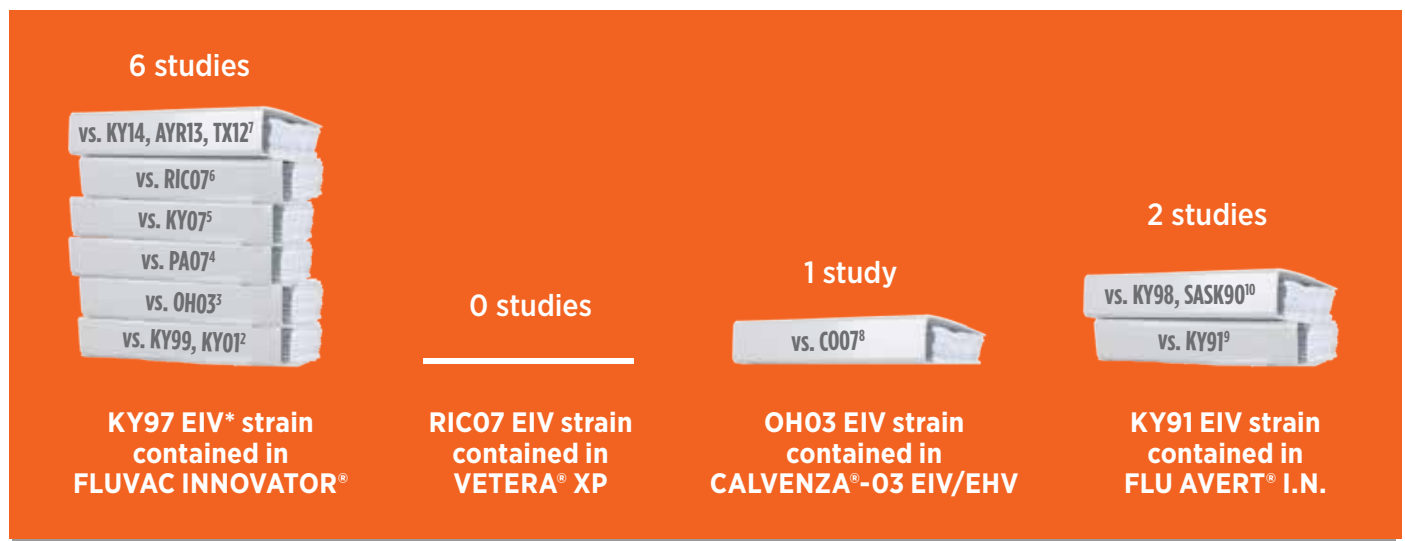
Smith recommends farmers or horse owners check the temperatures of hay that has been baled at a higher-than-desirable moisture concentration twice a day during that six-week post-baling window. If temperature readings are lower than 130°F, continue monitoring them twice per day. If those temperatures reach the 130-140°F range, Smith recommends rechecking that reading in a few hours. If the temperature is measured at 150°F, it is likely that number will continue to rise. At that point, he recommends moving the hay to allow air circulation and cooling and to monitor temperatures every few hours. (Note that experts also suggest moving affected hay with a fire department close at hand in

case the increased oxygen serves as the tipping point to fire.) If temperature readings are greater than 175°F, it is likely that a hay fire is imminent or already occurring. At that point, call the fire department immediately.

You can monitor temperatures inside hay using a probe and a thermometer. Commercial temperature probes are available but are often too short to monitor the maximum interior temperature. The Virginia Tech educational paper about hay fire prevention and control describes how to make a simple temperature probe with an iron pipe. It can be found in its entirety at <http://pubs.ext.vt.edu/442/442-105/442-105.html>. **UK**

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

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<sup>1</sup> West Nile-Innovator and Fluvac Innovator MDI Sales Data as of 12/31/14. Zoetis. Dec. 2014.

<sup>2,7</sup> Data on file, Study Report No. 671-02-001R, 671-08-004.R, 766-09-002.R, 100REQBIO-01, 140REQBIO-1 and 15EQRGBIO-02, Zoetis Inc.

<sup>8</sup> Calvenza vs. CO07 ACVIM 2011 abstract reference.

<sup>9</sup> Townsend HGG, Penner SJ, Watts TC, Cook A, Bogdan J, Haines DM, Griffin S, Chambers T, Holland RE, Whitaker-Dowling P, Youngner JS, and Sebring RW: Efficacy of cold-adapted, intranasal, equine influenza vaccine: challenge trials.

<sup>10</sup> Chambers TM, Holland RE, Tudor LR, Townsend HGG, Cook A, Bogdan J, Lunn DP, Hussey S, Whitaker-Dowling P, Youngner JS, Sebring RW, Penner SJ and Stiegler GL: A new modified-live equine influenza vaccine: phenotypic stability, restricted spread and efficacy against heterologous virus challenge.

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# UK Gluck Center to Host Immunology Symposium in November

The University of Kentucky Gluck Equine Research Center will host a one-day symposium titled “Role of Immunology in Equine Health” on Saturday, Nov. 21 from 8 a.m. – 5 p.m. at the Embassy Suites in Lexington.

This symposium will focus on the immune system’s role in equine diseases caused by viruses, bacteria, and parasites. Scientific experts will specifically present information on the immune response to equine arteritis virus, respiratory disorders, parasitism, skin diseases, and immune changes in the foal. They will also discuss factors affecting the immune response to vaccines.

The symposium is targeted toward veterinarians, regulatory officials, farm managers, and breed registry representatives.

The symposium is partially funded by a USDA-NIFA-AFRI (United States Department of Agriculture-National Institute of Food and Agriculture-Agriculture and Food Research Initiative) grant titled “Identification of genetic factors responsible for establishment of equine arteritis virus carrier state in stallions.” However, registration is required, and the event costs \$25. To register, visit <http://immunologysymposium.eventbrite.com>.

Eight hours of Continuing Education is pending approval by the Kentucky Board of Veterinary Examiners for veterinarians and veterinary technicians. Attendees must sign CE sheets at the meeting to receive credit.

For more information, contact Jenny Evans at [jenny.evans@uky.edu](mailto:jenny.evans@uky.edu) or 859/218-1089.

>Jenny Evans, MFA, is the interim executive director of the Gluck Equine Research Foundation and marketing and promotion specialist senior at the Gluck Equine Research Center.

## SYMPOSIUM SCHEDULE

<b>8-8:30 a.m.</b>	Registration
<b>8:30-9:30</b>	An overview of the immune system — <i>Amanda Adams, UK Gluck Equine Research Center</i>
<b>9:30-10</b>	Immune control of vector-borne pathogens — <i>Robert Mealey, Washington State University</i>
<b>10-10:15</b>	BREAK
<b>10:15-11</b>	Immune response to EAV — <i>Udeni Balasuriya, UK Gluck Equine Research Center</i>
<b>11-noon</b>	Equine lymphoma: classification and an integrative approach to diagnosis — <i>Renaud Leguillette, University of Calgary</i>
<b>Noon-1 p.m.</b>	LUNCH and LECTURE: Trends in vaccine development — <i>Frank Cook, UK Gluck Equine Research Center</i>
<b>1-1:45</b>	Immune response of the uterus to sperm and bacteria — <i>Robert Causey, University of Maine</i>
<b>1:45-2:30</b>	Immune response of the foal — <i>David Horohov, UK Gluck Equine Research Center</i>
<b>2:30-2:45</b>	BREAK
<b>2:45-3:30</b>	Immunodiagnosics and molecular diagnostics of equine lymphoma — <i>Peter Moore, University of California, Davis</i>
<b>3:30-4:15</b>	Immune response to parasites — <i>Don Knowles, Washington State University</i>
<b>4:15-5</b>	Local and systemic immune response to bacterial infection — <i>John Timoney, UK Gluck Equine Research Center</i>
<b>5-5:15</b>	CLOSING REMARKS

## Upcoming Events

### Sept 30-Oct. 3

UK College of Agriculture, Food and Environment Round Up, Good Barn, UK campus

### October 24-31

Breeder’s Cup Festival, Downtown Lexington

### October 29, 4 p.m.

Seminar Series, UK Veterinary Diagnostic Laboratory, Frank Andrews, DVM, MS, Dipl. ACVIM, from Louisiana State University will speak about gastric ulcers.



## Be sure to follow us on Social Media

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

Follow the UK Ag Equine Programs on Twitter at UKAgEquine. The UK Maxwell H. Gluck Equine Research Center is also on Twitter at UKGluckCenter.

Got Facebook? Like these pages administered by us:

### University of Kentucky Ag Equine

**Programs:** UK Ag Equine Programs is an overarching framework for all things equine at the University of Kentucky, including the undergraduate degree program, equine-related student organizations, equine research, and outreach activities.

**University of Kentucky 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.

**University of Kentucky Horse Pasture Evaluation Program:** The University of Kentucky Horse Pasture Evaluation Program is a service program offered to horse farms in Kentucky with the goal of overall improved pasture management. Regardless of breed or discipline, the programs goals are to: provide detailed pasture management recommendation to horse farm owners and managers; help improve pastureland to increase quality and quantity of pasture as a feed source and reduce the need for stored feeds such as hay and grain; and assess the potential risk of fescue toxicity of individual pastures to pregnant broodmares.