

Necropsies Teaching About Catastrophic Racehorse Injuries

Researchers are making steady progress toward understanding catastrophic fractures and, ultimately, how to prevent them.

“Every racehorse that dies on the track is a tragedy,” said Laura Kennedy, DVM, Dipl. ACVP. But each of those horses, she said, is an opportunity to learn, collect data, and educate about what happened.

As part of the Kentucky Horse Racing Commission’s (KHRC) Necropsy Program, Kennedy, an assistant professor and veterinary pathologist at the University of Kentucky (UK) Veterinary Diagnostic Laboratory (VDL), in Lexington, examines every racehorse that dies or is euthanized at any KHRC-regulated property. During each necropsy, she records detailed information about the horse with the hope that she and her colleagues can, eventually, eliminate catastrophic injuries from racing. And while the end goal remains a long way off, Kennedy and her coworkers have made substantial progress in understanding catastrophic fractures and why they happen. She presented an update on

the program and her work Oct. 13 at UK’s Gluck Equine Research Center.

Program History

Kennedy said the KHRC’s necropsy program is largely based on the California Horse Racing Board’s “flagship program,” which aimed to study the nature of the fatal injuries, determine the reasons behind them, and eventually develop preventive strategies.

The KHRC’s necropsy program was launched in January of 2009 for two reasons, Kennedy said. One reason was that a number of high-profile racehorses, including Barbaro and Eight Belles, had suffered catastrophic injuries in recent years. But the main catalyst behind it, she said, was a higher-than-normal number of breakdowns at Turfway Park, in Northern Kentucky, in December 2008.

“Eight horses died in four weeks,” she said. “But today, Turfway Park is consistently among the safest race-tracks in the United States.”

Prior to 2009, fatal racehorse injuries were simply documented. From 2009 to 2012, all horses that suffered

fatal injuries during races underwent necropsies, during which the pathologist documented the nature of the injury in detail and examined the contralateral limb (the one opposite the injured limb; so, the left forelimb is the contralateral limb when the right fore is injured).

In 2012, the program expanded to include any horse that died or was euthanized, regardless of the reason, at any KHRC property. Additionally, Kennedy and her coworkers began performing extensive examinations on the contralateral limb and documented the structure in detail. This procedure remains in place; the only change is that Kennedy developed a 0 to 3 scoring system for pre-existing pathology identified in the contralateral limb, which she began using in 2015. A score of 0 represents little to no anomalies, and a 3 reflects serious pre-existing pathology.

How It Works

Kennedy said the necropsy program actually begins before races. The KHRC staff reviews each horse’s past performances, watches workouts, and notes any anomalies they identify and takes special care to examine those horses closely even before the pre-race exam all competitors must undergo.

“In most cases, those horses are cleared to race and do so uneventfully,” she said.

Any horse that dies on KHRC property, regardless of cause, becomes

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Catastrophic Injuries

property of the KHRC, Kennedy said. This isn't to take the owner out of the picture, she said, but to ensure each body is handled and each necropsy is conducted in the same manner.

Kennedy said control horses—those that die from non-musculoskeletal causes such as colic, laminitis, or illness—are just as important as the horses with catastrophic injuries. Such horses lived and trained in the same general environment, she said, but did not suffer catastrophic injury.



ANNE M. EBERHARDT/THE HORSE

Eight Belles suffered catastrophic compound fractures of both front legs while galloping out after finishing second in the 2008 Kentucky Derby. Her death was one of the catalysts behind the KHRC necropsy program.

Once the body is assigned a unique identifier, Kennedy and her team conduct a routine necropsy, then collect the injured and contralateral limbs, removing them from the body above the hock or knee. The team takes radiographs of each limb to compare to their findings when they dissect and examine each limb closely.

"Sobering" is how Kennedy described the differences between what's typically visible on radiographs and the damage actually present in the limb. Radiographs don't generally appear abnormal until there's very serious damage to the bony and soft-tissue structures, she said.

After the KHRC finalizes their mortality review, Kennedy said they review the findings with the horse's connections with a focus on education rather than reprimand.

The "Bad Step" Myth

For years, many racing industry

members have believed in the so-called "bad step" myth—that a completely healthy horse can take a single bad step and suffer a catastrophic injury.

"It sort of excused us from responsibility and lent credence to the belief that racing injuries were inevitable," Kennedy said. "But in the vast majority of cases, it's just not true."

She and colleagues have confirmed that catastrophic fractures occur in consistent sites with consistent patterns and that everything is bilaterally symmetrical—the contralateral limb will have pre-existing pathology in the same location that the fracture occurred.

Fracture Findings

Since the program began in 2009, Kennedy estimates she's examined more than 300 horses. In that time, she and her colleagues have observed a number of trends. She said horses that suffered catastrophic injury aren't the only ones with pre-existing pathology in their bones and joints—control horses generally do, as well. This, of course, leads to more questions.

"What's normal wear and tear, and what's abnormal? Where do you draw the line?" Kennedy said. "Some control horses have more significant damage than fracture horses. Is that damage pathology or normal adaptation?"

Sesamoid fractures Fractures of the small bones on the back of the fetlock are the most common, but also the least rewarding, Kennedy said.

"They're the least understood, there's the least research on them (of any fracture type), and they're the most confusing," she said. "They're a total enigma."

Kennedy said there appear to be two types of sesamoid fractures: ones that result from suspensory ligament (which runs behind the sesamoids and supports the limb) failure and those that have primary sesamoid bone pathology. However, it's still challenging to differentiate between the two, she added.

Common pre-existing pathology include cartilage loss and marginal (bone edge) remodeling.

Masthead

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Catastrophic Injuries

Condylar fractures These fractures occur at the bottom of the cannon where the bulbous end of the bone meets the fetlock joint. Lateral condylar fractures (those that occur on the outer half of the bone) are much more common than medial fractures (which occur on the inner side of the leg), Kennedy said.

Lateral fractures don't cross the bone's midline, but travel up about 8 to 12 centimeters, on average, and exit on the same lateral side as the fracture.

Medial fractures tend to spiral, Kennedy said. They typically originate in the parasagittal groove (a depression on either side of the ridge in the fetlock joint), cross the midline of the bone within about 2 centimeters of the origin, and travel up the bone to the knee. The carpal (knee) joint generally isn't involved in these fractures, she said.

With both types of condylar fracture, there's typically pre-existing damage to the parasagittal grooves, she said.

"We know the pathology is bilateral and symmetric, but we still aren't sure which limb is more severely affected," Kennedy said. "Is it the limb that fractured? Or is it the contralateral limb, and the horses are overloading the limb that ultimately fractures?"

Common pre-existing pathology includes flattening of the normally round condyles, damage to the subchondral bone (located just under the cartilage), cartilage loss, and parasagittal groove scoring (most horses will have mild lines at the groove).

Pastern fractures Long pastern fractures aren't as common as sesamoid or condyle injuries, Kennedy said. "Conditions evaluated in the first phalanx (the

long pastern bone) include thickening of the joint capsule, fibrosis (scarring) of the soft tissues surrounding the fetlock, and palmar arthrosis—damage to the cartilage of the first phalanx, which may or may not include abnormal proliferation of bone along the front of the fetlock joint," she said.

Combination fractures Kennedy also sees combination fractures of the sesamoids, condyles, and/or pasterns.

Diaphyseal metacarpal fractures (cannon fractures) These fractures occur in the middle of the shaft of the bone and do not impact the fetlock or knee. Kennedy said these result from bucked shins, a common condition that she said isn't always treated as seriously as it should be.

"They're microfractures of the bone," Kennedy said, adding they need to be taken seriously and the horse should be treated appropriately.

She said horses with diaphyseal metacarpal fractures almost always have evidence of unhealed bucked shins on the contralateral leg.

Other fractures Less common injuries include fractures of the carpus, humerus, scapula, and pelvis, she said.

Case Studies

Kennedy closed her presentation with two examples of cases the KHRC has investigated with the necropsy program.

Case 1 involved a 6-year-old gelding that began race training in the summer of his 5-year-old year. He won his first start in January of his 6-year-old year and suffered a fatal diaphyseal metacarpal fracture in his second start.

The necropsy revealed that the key in this case was the horse's age when he started training.

"A 5-year-old horse's bones aren't able to adapt to race training," Kennedy

said, emphasizing the importance of starting training young so bones can effectively remodel and become stronger.

The horse's trainer was unaware of the risk posed by the horse's history, she added, so the KHRC educated the individual on how to ensure such a case doesn't happen in the future.

Case 2 involved a 4-year-old mare that was a homebred by her owner. She started race training at the appropriate time and raced regularly with some success. Eventually, she suffered a carpal fracture.

In this case, the KHRC investigators determined that the mare, as part of her routine care, received phenylbutazone, a step her trainer always took because it's what he'd been taught was acceptable when administered at "safe" doses and not within the recommended withdrawal times before races. As a result, the mare's lameness exams were compromised and she was declared sound when, in fact, an underlying injury had developed.

The trainer, devastated by the loss, learned about the dangers of long-term medication administration masking injuries from the commission.

Take-Home Message

While there's still much work to be done, Kennedy and her colleagues are making steady progress toward understanding catastrophic fractures and, ultimately, how to prevent them.

In closing, Kennedy shared that one of her colleagues believes it's a good thing such injuries don't occur out of the blue: "If their legs just (broke), what would we do? It's good news that we have a problem we can solve. We have something to make better." **UK**

>Erica Larson is the news editor for *The Horse*.



Carrier stallions maintain infectious agents in the breeding population from one season to the next.

The Asymptomatic Carrier Stallion

A range of venereally transmissible agents—viral, bacterial, and protozoal—have long been known to establish persistence or the carrier state in stallions, mares, or both. Some of these agents (e.g., *Pseudomonas aeruginosa*, certain capsule types of *Klebsiella pneumoniae*, and *Streptococcus zooepidemicus*) are commonplace in most domesticated horse populations. Others such as equine herpesvirus-3, equine arteritis virus, *Taylorella equigenitalis*, or *T. asinigenitalis* are less frequently encountered. Of additional significance is *Trypanosoma equiperdum*, the causal agent of dourine, which though rarely reported nowadays, is

Carrier Stallions

reputedly still present in certain regions and countries of the world.

Even though some, but not all, of the foregoing agents can establish persistent infection in both the stallion and the mare, it is the carrier stallion that plays a more important role in the epidemiology of the respective infections. Not only has it the potential to disseminate a particular infectious agent among the mares to which it is bred, but of even greater long-term significance, it ensures the transfer of infection from one breeding season to the next.

While some of these agents, such as equine arteritis virus and *T. equigenitalis*, can be transmitted either through natural service or artificial insemination, the risk of more widespread transmission is much greater through the practice of artificial insemination with fresh-chilled or frozen semen from a carrier stallion. This was borne out in the course of the 2006 equine viral arteritis disease event in the United States, when fresh-chilled semen from a well-known Quarter Horse stallion in high commercial demand was responsible for spreading the virus to breeding stock in 18 states and two provinces in Canada,

all within a two- to three-week period. This resulted in outbreaks of equine viral arteritis, abortion in naive pregnant mares, and establishment of the carrier state in a variable number of exposed stallions.

It must be emphasized that stallions that continue to harbor equine arteritis virus, equine herpesvirus-3, or *T. equigenitalis* are asymptomatic or clinically inapparent carriers. With the exception of infection with *T. equiperdum*, there is no means of knowing whether a stallion is a carrier of a particular venereal pathogen or not without subjecting it to appropriate testing protocols for whatever the agent under consideration might be. Regardless of what venereal infection is being screened for, however, it is critically important that such testing is carried out by a reputable veterinary diagnostic laboratory with an established record of competency and experience in testing for that infection. The reliability of laboratory testing is crucially important to the success of any prevention and control program especially in the case of equine viral arteritis and contagious equine metritis.

A further confounding factor when dealing with stallions that are asymptomatic carriers of equine arteritis virus or *T. equigenitalis* is the fact that the majority of naive mares to which they

are bred subsequently exhibit minimal, if any, clinical evidence of infection. This leaves the breeders and mare owners unaware that transmission of infection has occurred and that the stallion in question is a carrier of either of these two venereal pathogens.

This could have significant consequences in the case of equine arteritis virus should such an acutely infected mare be pastured with naive pregnant mares. The 2008-2010 CEM event in the United States illustrated how easily a stallion that was a carrier of *T. equigenitalis* could escape detection at time of importation and ultimately be responsible for the very costly event that first came to light in 2008.

Past and recent experiences underscore the importance of screening breeding stallions regardless of breed, for presence of the carrier state. This applies especially to equine arteritis virus. Moreover, the responsibility for ensuring the safety of breeding stallion populations ultimately resides with the equine industry.

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>This is an excerpt from *Equine Disease Quarterly*, funded by underwriters at Lloyd's of London.

UK Saddle Up Safely Representatives Present at International Concussion Conference

Representatives from Saddle Up Safely, a rider safety awareness program sponsored by UK HealthCare and UK College of Agriculture, Food and Environment, presented at the 5th International Sports Concussion Consensus Conference Oct. 27-28 in Berlin, Germany.

This was a joint effort by representatives of the university's College of Medicine; HealthCare; College of Agriculture, Food and Environment; Sports Medicine Research Institute; Kentucky Neuroscience Institute;

Spinal and Brain Injury Research Center; College of Health Sciences; and Saddle Up Safely.

As a result of the increasing focus on head and brain injuries, the International Ice Hockey Federation, the International Olympic Committee, Fédération Internationale de Football Association, World Rugby, and the Fédération Equestre Internationale have taken lead roles in organizing the conference into the world's most influential process for policymakers on concussions in sports.



Scientists hope to find more accurate ways to recognize when a concussion has occurred.

Conference attendees had several key goals, including finding ways to recognize

when a concussion has happened more accurately, developing more effective

International Concussion Conference

treatments, revising return-to-play guidelines, and understanding the long-term consequences of repeated concussions so guidelines can be created to determine when an athlete should no longer participate in sports.

Saddle Up Safely was represented at the conference, which occurs every four years, by Carl Mattacola, PhD, ATC, FNATA, professor and associate dean for academic and faculty affairs in UK's College of Health Sciences; Dan Han, PsyD, chief of UK's Neuropsychology Service and director of neurobehavioral studies at the

UK Sports Medicine Research Institute; Fernanda Camargo, DVM, PhD, associate professor and equine Extension specialist in the Department of Animal and Food Sciences; and Bill Gombeski, senior advisor at UK HealthCare. The group presented these five abstracts in the equine section, which will be published in the May 2017 issue of the *British Journal of Sports Medicine*:

- Clinical Effect and Sensory Correlates in Adolescent Sports Concussions, presented by Han;
- Concussion Characteristics in Horse Racing, presented by Mattacola;
- Effect of Repeated Testing on Equine Helmet Impact Attenuation, presented by Mattacola;
- Irritability and Aggression in Persistent Youth Concussions, presented by Han; and
- Saddle Up Safely Guidelines for Return to Horse-Related Activities After Concussion, presented by Camargo.

Han said the "return to riding guidelines and concussion assessment protocol were well-accepted by those who came by to discuss our abstracts."

Camargo added, "The most beneficial part of the conference was the fact that they reiterated that a thorough physical examination by a specialist is paramount to diagnosing and treating the concussion."

The organizing committee will compile the overall consensus from the conference and publish it next year. They are currently developing a standardized tool, known as SCAT 4, for evaluating injured athletes for concussion.

"During the conference a number of contacts were made and ideas were generated for getting our latest Saddle Up Safely booklet, *Safe Return to Riding*, out to appropriate stakeholders," Gombeski said. "UK seemed to be ahead of other sports organizations in that we had a very concrete return to riding protocol for injured concussed riders and their caregivers to use."

For a copy of the return-to-riding guidelines, concussion assessment protocol, and more information on Saddle Up Safely, visit ukhealthcare.uky.edu/saddleup. UK

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

A thorough exam by a specialist is paramount to diagnosing and treating concussions.

THE GRASS GUIDE

KENTUCKY BLUEGRASS (*Poa pratensis* L.)

Life Cycle: Cool-season perennial

Native to: Europe

Uses: Pasture

Identification: Boat-shaped leaf tip

Bluegrass is synonymous with Kentucky and for good reason. Kentucky bluegrass is well adapted to the cool, humid growing conditions found in Kentucky and throughout the transition zone of the eastern United States and most northern states. It grows well in a wide variety of soils.

Kentucky bluegrass is very winter hardy but does not tolerate hot, dry summers found further south. It is low-growing and, therefore, low-yielding. As such, it is not an ideal forage for hay, but is excellent for horse pasture. It is highly nutritious, very palatable, and tolerant of close, frequent grazing. Kentucky bluegrass also forms a tight sod, providing good pasture footing. This grass species is slower to germinate than most cool season grasses, taking at 7 to 21 days.

Detailed seeding dates and rates can be found in the Grain and Forage Crop Guide for Kentucky (AGR-18) at www.uky.edu/ag/forages or by contacting your local county Extension office. UK



Kentucky bluegrass is a low-growing, sod-forming cool season grass.

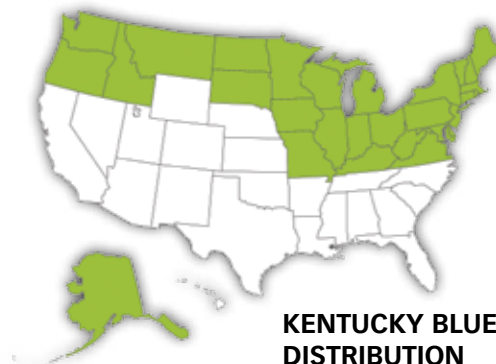


The seedhead of Kentucky bluegrass.



Kentucky bluegrass is easily identified by dark, narrow leaves with tips shaped like a boat's bow.

>Information provided by AnnMarie Kadnar, graduate student; Krista Lea, MS, coordinator of the UK Horse Pasture Evaluation Program; and Ray Smith, PhD, professor and forage extension specialist. All three are part of UK's Department of Plant and Soil Sciences.



KENTUCKY BLUEGRASS DISTRIBUTION

The Importance of Cleaning to Disinfection

Cleaning and disinfecting stalls is critically important for biosecurity, especially in controlling disease outbreaks. However, much misinformation exists.

The average 1,000-pound horse produces 50 pounds of manure and urine per day. Add on to that other body fluids that potentially contain pathogens (nasal discharges, abscess material, blood, etc.), and a significant organic load exists in the average horse stall. Any surface that needs to be disinfected (treated with chemicals in order to kill pathogens) must be cleaned of dirt and organic material first.

Cleaning a stall takes detergent and manual labor. Power washers should not be used to avoid aerosolizing pathogens. Despite advertising claims, no “one-step” product exists that can be sprayed on a dirty stall and effectively kill pathogens. Surfaces must be scrubbed with a detergent or cleaning agent to loosen and remove as much organic matter as possible.

Detergents are cleaning agents that emulsify (loosen) organic matter without forming a “soap-scum” residue. A detergent should be used to scrub stall surfaces followed by rinsing to physically remove dirt and organic matter. Only after surfaces have been cleaned should they be sprayed with a disinfectant.

Studies have shown that over 90% of bacteria are removed from surfaces that are thoroughly cleaned first. Considering that equine herpesviruses, influenza viruses, and equine arteritis virus are lipid-enveloped, cleaning surfaces with detergent will disrupt this envelope, helping to render these viruses inactive.

While bleach is an effective disinfectant on “hard, non-porous, previously cleaned surfaces,” horse stalls on farms are rarely constructed of such materials. Bleach is also rapidly inactivated by organic matter.

Disinfectant labels state that “it is a violation of Federal law to use this product in a manner inconsistent with its labeling.” Users should understand and follow label instructions and call the

manufacturer with any specific questions. If the label states “dilute ½ ounce of disinfectant concentrate in one gallon of water,” use that dilution. Increasing the amount of chemical assuming it will overcome a dirty surface is a waste of time and money and could pose health hazards to people and animals.

Never mix different disinfectants together. For example, bleach combined with ammonia or strong oxides can produce lethal gas and dangerous chemical compounds. Every approved disinfectant in the United States has a safety data sheet (previously known as a material safety data sheet) which is available from the manufacturer and contains valuable information.



THE HORSE STAFF

Appropriately cleaning a stall takes manual labor.

Additionally, the statement “proven effective against the following organisms,” followed by a long list of pathogens, is on many disinfectant labels. However, in the fine print is how this list was generated. Most disinfectants have been tested in the presence of 5% serum as the “organic” load. A feces-stained stall wall has an organic load much higher than 5% serum, which is why cleaning is critical to the effectiveness of any disinfectant.

Excellent infection control and disinfectant information is available at cfsph.iastate.edu and aaep.org.

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>This is an excerpt from *Equine Disease Quarterly*, funded by underwriters at Lloyd’s of London.

Gluck Center Doctoral Candidate Wins Campus-Wide 3MT Competition

Carleigh Fedorka, a doctoral candidate at the UK Gluck Equine Research Center, won UK’s Three Minute Thesis (3MT) competition on Nov. 15, in the Gatton College of Business and Economics’ Kincaid Auditorium.

Fedorka was one of nine graduate students who made it to the finals. She received a \$1,000 prize and an all-expense-paid trip to the Southern Council of Graduate Schools Regional Competition to be held March 2-5, 2017, in Annapolis, Maryland.

The 3MT rules, which were originally developed at a university in New Zealand, allow students three minutes to discuss their research using only one presentation slide and no gimmicks (e.g., props, costumes, songs, etc.).

Fedorka’s presentation was titled “The dirty broodmare ... cleaned up.” She first gave her presentation on biologic therapeutics as an endometritis treatment during the Department of Veterinary Science’s 3MT competition in April where she was among the top three finalists. For the campus-wide competition Fedorka was among the top 15 selected for the first round that was narrowed down to eight before moving on to the finals.

“I think the ability to take research and make it understandable to the masses is essential, as well as the skill of public speaking,” Fedorka said.

On top of taking home the grand prize, Fedorka was also selected as the “People’s Choice” favorite and received another \$125. **UK**

>Taylor Pence is a marketing and communications intern at the UK Gluck Equine Research Center, a senior marketing major at UK, and president of the UK Dressage and Eventing Team.

GRAD STUDENT SPOTLIGHT

ASHTON MILLER

From: Charlottesville, Virginia
Degree and institute where received: BS in health services administration and a minor in business, James Madison University

Ashton Miller chose to come to the UK to pursue her doctoral degree in veterinary science because the program blends her two passions—horses and science.

"UK's Veterinary Science department is unique in that its research is focused on the horse," she said. "There are very few places in the world where so many people are gathered in one location to investigate equine health ... and equine health only."

Miller is currently working in the laboratory of Amanda Adams, PhD, assistant research professor at the Gluck Equine Research Center. Miller's research is focused on the immune systems of geriatric horses, particularly those with pituitary pars intermedia dysfunction (PPID)—a common endocrine disease in older horses, which is commonly referred to as equine Cushing's disease.

"In horses with PPID, I am especially interested in how their endocrine dysfunction affects their local and systemic immune responses," Miller said.

In addition, Miller is working in collaboration with the UK VDL on a retrospective epidemiological study focused on diseases associated with geriatric horses.

When asked what her most valuable takeaway from the program is so far, Miller said, "The veterinary science department at UK is full of researchers with different specialties, but all of them are focused on progressing our knowledge of health and medicine in the horse.

"Frequently, diseases and conditions overlap, and you need someone else's expertise to advance" in research or with a case, she continued. "The veterinary science department at UK has shown me how valuable this is, and will continue to be, and how to put it into practice. In today's ever-expanding scientific world, it is critical to have top-notch collaborators who are excited about their work. The ability to successfully and efficiently collaborate will be an extremely valuable skill in my future endeavors."

Miller plans to graduate in 2018 and, at this point, is keeping options open for her future career plans. **UK**

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



UK College of Agriculture,
Food and Environment

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Dallisgrass Makes a Rare Impact on Kentucky Horse Operation

Scientists believe a batch of grass hay containing dallisgrass recently caused neurologic problems in horses residing in Bell County, Kentucky, located in the southeastern part of the state on the Tennessee border.

One affected horse was reportedly staggering and displaying a wide stance, muscle trembling, and difficulty balancing. The animal's clinical signs subsided after the hay was removed from his diet, but a similar series of events followed when another animal consumed the same hay.

Ray Smith, PhD, forage Extension specialist at UK, examined the hay. He found that it contained up to 20% dallisgrass (*Paspalum dilatatum*) and many of the seedheads were anomalous, appearing swollen and rusty or dark in color. While no laboratory tests are available, a careful visual inspection indicated that seedheads were infected with the endophytic fungus *Claviceps paspali*.

Megan Romano, DVM, a veterinary toxicology resident at the UK VDL, shared some information about dallisgrass that horse owners should be aware of:

Dallisgrass is a warm-season tufted perennial grass. Like bermudagrass (*Cynodon dactylon*) and perennial rye (*Lolium perenne*), dallisgrass can cause "stagers" in horses and cattle.

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¹ Cortese V, Hankins K, Holland R, Syvrud K. Serologic responses of West Nile virus seronegative mature horses to West Nile virus vaccines. *J Equine Vet Sci.* 2013;33:1101-1105.

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Dallisgrass



STACY WHITE

Infected dallisgrass seedheads are often swollen and rusty or black in color.

It has been traditionally found in the southeastern United States, but as climate change has led to increasingly warmer temperatures, its range has expanded to include parts of Kentucky. Currently the USDA plants map shows dallisgrass in at least 22 Kentucky counties.

Staggers occur when animals graze on seedheads infected with the *C. paspali*. Fungal spores can overwinter on the ground and become airborne in the spring. They attach to dallisgrass spikelets at the time of flowering, sending hyphae into the plant. Sclerotia, or masses of fungal tissue, are similar in size and shape to uninfected dallisgrass seeds but are much darker. Where unaffected seeds are light brown to tan, sclerotia turn dark brown to black and harden in texture. Normal seeds and sclerotia mature and drop off the seedheads at the same time; the fungal spores persist on the ground over the winter and the cycle begins anew. Because the potential for toxicity is unchanged with drying or storage, dallisgrass hay poses a risk, as does pasture.

Affected cattle and horses typically appear clinically normal at rest initially. Signs often begin with fine tremors of the head and twitching of the neck and shoulders, becoming more pronounced as the disease progresses. Animals often stand base-wide in the hind limbs. Moving or exciting affected animals can cause more severe signs—including ataxia (incoordination), staggering, seizures, and collapse—to appear.

There is no effective medical treatment for staggers, and diagnosis is made by clinical signs and history

UKVDL Announces Holiday Hours, Altered Testing Schedule

The UK VDL will have modified hours and a slightly altered testing schedule for the upcoming holidays. The laboratory will be closed Nov. 24 (Thanksgiving), Dec. 25 (Christmas), and Jan. 1 (New Year's Day).

The holiday hours are as follows:

Thanksgiving	Thursday, Nov. 24	CLOSED
	Friday, Nov. 25	*9:00 – Noon
	Saturday, Nov. 26	*9:00 – Noon
	Sunday, Nov. 27	*1:00 – 5:00
Christmas	Saturday, Dec. 24	*9:00 – Noon
	Sunday, Dec. 25	CLOSED
	Monday, Dec. 26	*9:00 – Noon
New Year's	Saturday, Dec. 31	*9:00 – Noon
	Sunday, Jan. 1, 2017	CLOSED
	Monday, Jan. 2, 2017	*9:00 – Noon
Martin Luther King Jr. Day	Monday, Jan. 16, 2017	*9:00 – Noon

* Open to receive animals for necropsy and specimens only, no test results available.

Additionally, some testing schedules have been altered due to the holidays. EVA-VN and VS-VN tests will not be set on Dec. 23 or Dec. 30. Instead, EVA-VN tests will be set on Dec. 20, 27, and Jan. 3, and VS-VN tests will be set on Dec. 21, 28, and Jan. 4. [UK](#)

of grazing infected grasses or eating infected hay. Removing animals quietly and slowly from the infected pasture or removing hay that contains infected grass remain the only treatment. Every effort should be made not to cause stress or excitation, as this will worsen the signs and potentially cause animals to injure themselves, herdmates, or handlers.

To prevent dallisgrass staggers, check horses' pasture and hay sources for

infected grass. Because the fungus is present in the seedheads, infected grass can be mowed to remove seedheads. Another option is to maintain high grazing pressure to prevent the grass from going to seed. Because the fungus is an endophyte, and therefore present within the plant tissue itself, neither cleaning the hay nor separating affected and unaffected plant material is effective at removing toxin. Infected hay must be removed from animals' diets

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Dallisgrass

and replaced with uncontaminated hay.

As noted, dallisgrass is not yet common throughout Kentucky, but it is slowly encroaching into the area. Pastures containing dallisgrass should be kept mowed to remove seedheads and reduce the risk of *C. paspali* infections. Hay harvested from pastures containing dallisgrass should be carefully inspected for signs of infections and destroyed if sclerotia bodies are found.

Smith said he believes this to be an isolated event in Kentucky and not a widespread challenge to the area. Still, horse owners should be vigilant and check hay and pastures regularly for dallisgrass. As there are numerous causes of tremors and neurologic abnormalities in horses, owners should

contact their veterinarian immediately if they notice any animals showing neurologic signs. **UK**

>Information provided by Megan Romano, DVM, a veterinary toxicology resident at the UK Veterinary Diagnostic Laboratory; Krista Lea, MS, coordinator of UK's Horse Pasture Evaluation Program; Cynthia Gaskill, DVM, PhD, clinical veterinary toxicologist at the UKVDL; and Ray Smith, PhD, forage Extension specialist at UK.

Upcoming Event

Jan. 27-28, 2017

UK Equine Showcase and Kentucky Breeders' Short Course, Fayette County Extension Office. For more information and to register, visit 2017ukshowcaseshortcourse.eventbrite.com.

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- **UK Equine Alumni** A community established for the alumni of the UK equine programs, including ESMA, graduate students and clubs and teams' members.
- **UK Maxwell H. Gluck Equine Research Center** The Gluck Center's mission is scientific discovery, education, and dissemination of knowledge for the benefit of the health and well-being of horses.
- **UK Horse Pasture Evaluation Program** A service program offered to Kentucky horse farms 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 through education about safe riding and horse handling practices. **UK**



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