

How Scientists Count Equine Parasites with a Cell Phone

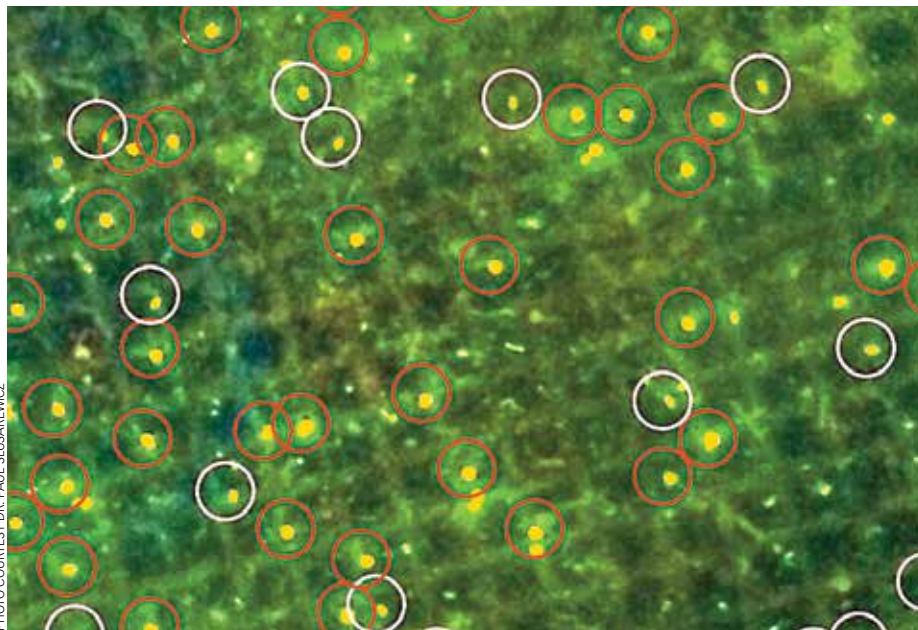


PHOTO COURTESY DR. PAUL SLUSAREWICZ

An example of a fecal egg count taken with an imaging unit and an iPhone, then counted by the Parasight app. Ascarid eggs (red circles) are identified separately from strongyles (blue circles).

In recent years equine veterinarians have lauded the benefits of fecal egg counts (or FECs) for designing targeted equine deworming programs. While these tests are already fairly simple—collect sample, submit to lab, and await results (which typically arrive in a few days to weeks, depending on the laboratory)—researchers have developed an even easier way: Collect the sample and let your veterinarian’s cell phone do the counting.

At the 2015 American Association of Equine Practitioners’ Convention, held Dec. 5-9 in Las Vegas, Paul Slusarewicz, PhD, shared how he and colleagues determined this was possible and what steps went into developing the final product. Slusarewicz is an adjunct associate professor at the University of Kentucky’s (UK)

Gluck Equine Research Center and the chief scientific officer and co-founder of MEP Equine Solutions, both in Lexington.

Fecal egg counts are a mainstay of clinical parasitology. They help veterinarians and horse owners confirm a horse’s parasite burden and shedding status, allowing them to deworm

based only on need. But these tests have remained relatively unchanged despite a recent revolution in molecular science, Slusarewicz explained. He and his colleagues sought to explore this technology and create a stall-side test to detect eggs in feces.

The first step, he said, was to identify a universal egg marker (UEM), which is present on all parasite eggs, that would allow software to detect the eggs amidst the rest of the debris in a sample. Slusarewicz determined that a carbohydrate called chitin—which is also present in shellfish, insects, and fungi, he said—could potentially serve as that UEM, but no one had suggested it could be a universal component of parasite eggs.

To test chitin’s usefulness, the team attached fluorescein dye (the fluorescent green substance your veterinarian uses to check for abrasions in your horse’s eye) to a naturally occurring protein that can bind tightly to chitin. They then stained the eggs and viewed the fecal sample under a fluorescence microscope, using different optical filters to block out the background debris and see if the eggs stood out. The eggs appeared fluorescent, indicating that, indeed, chitin can be used as a UEM.

Slusarewicz said the next step was to determine whether a computer running special software could count the eggs automatically once they’ve been stained and photographed with a microscope. The answer, again, was yes, but he pointed out one little hiccup: “The kind of microscope we

In This Issue

Kentucky Mosquitoes' Impact on Horses	02
The Grass Guide: Bahiagrass	05
Preventing Horse-Related Injuries to Humans	07

Counting Equine Parasites

used (to capture the image) costs about \$100,000," making it impractical for use in the field and cost-prohibitive for many practitioners.

So the team decided to test whether a less expensive and more mobile device—and one that most practitioners already have—could be effective for not only capturing an image but also running the egg-counting software they developed. They selected an iPhone with an added macro lens (designed for use in taking pictures of subjects up close) and found that it successfully captured usable images from a properly prepared sample.

After confirming that their counting method was feasible, it was time to see how well the software worked. Slusarewicz and colleagues collected eight fecal samples, counted them manually using the traditional McMaster method, and then ran a count using their iPhone and software system. He said the two correlated rather well, but the iPhone method needed some streamlining. So the team designed and built an imaging unit that includes the macro lens and optical filters needed to obtain the image. They've tested the software and imaging unit on three phones with cameras of different megapixels, Slusarewicz said, and even the lowest-resolution device gave very good results.

After making those adjustments, the team tested the system on five more fecal samples. This time, they found it more precise and sensitive than the McMaster method, he said.

They also determined that the software can distinguish between differ-

ent types of parasite eggs, "because horses have more than just strongyles," Slusarewicz said, referring to ascarids, the other clinically important internal parasite of horses. He showed that the app could accurately count both strongyle and ascarid eggs in a sample containing both. McMaster tests, on the other hand, are used most commonly to identify large and small strongyles.

Moving forward, the team is carrying out full validation studies and finalizing the system—dubbed Parasight—before it becomes available for purchase. "The Parasight System will not require specialized training and is anticipated to be available to veterinarians in the second half of 2016," he added.

"With the Parasight System," Slusarewicz said, "veterinarians will now have a portable, simple, rapid, and convenient test to replace the fecal egg count which can be conducted on-site. This will allow vets to once again take the lead in responsible parasite control strategies. Putting an end to the practice of prophylactic rotational deworming will not only reduce the amount of drugs given unnecessarily to horses, but also the alarming trend of increasing parasite resistance to all current classes of deworming medicines."

Slusarewicz said the development of the Parasight System was a cross-organizational collaboration between MEP Equine Solutions, the UK's College of Agriculture, Food and Environment and Gluck Center, the USDA (via a Small Business Innovation Research Grant), and Zoetis. **UK**

>Erica Larson is the News Editor at *The Horse*: *Your Guide to Equine Health Care* and *TheHorse.com*.



Kentucky Mosquitoes' Impact on Horses

Kentucky is home to more than 50 species of mosquitoes with a range of breeding sites and survival strategies. Some thrive when above-normal rainfall creates temporary ground pools; others develop in small accumulations of stagnant water during dry periods.

Many of our mosquito species spend the winter as freeze-resistant eggs that can survive prolonged harsh conditions. A few, such as the house mosquito (*Culex pipiens*), spend the winter as adults in protected places. They are vulnerable to severe cold, but like most insects have the reproductive capacity to build numbers by late summer, even if winter mortality is high.

Several mosquito species feed on horses with varied effects that range from adverse skin reactions to disease transmission. Proteins injected in mosquito saliva can

Masthead

University of Kentucky Ag Equine Programs

Jenny Evans, MFA, co-managing editor and interim executive director of the Gluck Equine Research Foundation, jenny.evans@uky.edu

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

Bluegrass Equine Digest Advisory Board

Bob Coleman, PhD, PAS, associate professor, director of undergraduate studies for equine science and management and extension horse specialist

David Horohov, MS, PhD, chair of UK's Department of Veterinary Science and director of the UK Gluck Equine Research Center

Ray Smith, PhD, professor and forage extension specialist in the department of plant and soil sciences

Jill Stowe, PhD, director of UK Ag Equine Programs and associate professor in the department of agricultural economics

Bluegrass Equine Digest Editorial Committee

Craig Carter, DVM, PhD, Dipl. ACVPM, director and professor of the UK Veterinary Diagnostic Laboratory

Laurie Lawrence, PhD, professor in the department of animal and food sciences

Krista Lea, MS, coordinator of UK's Horse Pasture Evaluation Program in the department of plant and soil sciences

William W. Witt, PhD, professor emeritus in the department of plant and soil sciences

The Horse: Your Guide to Equine Health Care

Alexandra Beckstett, Managing Editor
Brian Turner, Layout and Design

The Bluegrass Equine Digest is a registered trademark of the University of Kentucky Ag Equine Programs and Gluck Equine Research Center. The Bluegrass Equine Digest is produced by the University of Kentucky in partnership with TheHorse.com and sponsor Zoetis. It is published monthly to provide up-to-date information on equine research from the University of Kentucky's College of Agriculture, Food and Environment. Research material is meant to be shared. However, materials are copyrighted and require reprint permission from UK Ag Equine Programs. Past issues of the Bluegrass Equine Digest are available at www2.ca.uky.edu/equine/bed.

Kentucky Mosquitoes

produce irritating bites that can cause skin reactions in sensitive individuals. The inland floodwater mosquito (*Aedes vexans*) is a widespread pest that can develop in any ground pool that lasts 10 to 14 days. It causes a significant and chronic problem in some parts of the state and can give rise to several generations each year. Females rest on vegetation and shaded grass during the day and bite viciously at dusk and after dark. They can live for several weeks and may travel several miles during that time. Feeding by large numbers of these mosquitoes at night can produce dermatitis and itching in horses on pasture.

Feeding habits, the ability to sustain and pass viruses, and host preferences for blood meals affect the potential for some mosquito species to serve as disease vectors. Some mosquito species feed primarily on mammals, others on birds, and some are opportunistic. Ornithophilic mosquitoes (*Culex pipiens* group) can maintain an avian cycle of Eastern equine encephalitis, Saint Louis encephalitis, and West Nile viruses among various bird species. Some of these mosquitoes serve as bridge vectors for viruses when they initially feed on infected birds and then take blood meals from mammals.

The rapid spread of West Nile virus across the U.S. required quick action to manage vector mosquitoes in an effort to protect equines and humans. Mosquito management takes a multi-pronged approach including source reduction, screens, and protection using repellents and insecticides. Fortunately, a combination of factors—selection for immunity in the avian population, development and registration of a vaccine, and mosquito management—were instrumental in quickly reducing the annual number of equine cases from a high of 513 in 2002 to eight in 2004. A few cases have been diagnosed each year since 2004, but vaccination has played a significant role in keeping the incidence low. A sound prevention program, which includes mosquito management is an important part of keeping the disease in check.

The Zika virus and yellow fever mosquito (*Aedes aegypti*) have captured the headlines in recent weeks. The yellow fever mosquito is not a part of

COMMENTARY

You Can't Believe Everything You Read, Hear, or See

Critical thinking is more important than ever, and I am continually amazed at the erroneous, misleading information to which we are exposed.

Always be wary of grandiose statements.

When Zika virus made the headlines in the U.S., an "expert" on the national news stated "all we have to do is kill the mosquitoes" to keep the disease out of North America. And, he wasn't making a joke.

One only has to look online at news reports from late 1999 to find reassurances by public health officials that citizens didn't need to worry about the "new" West Nile virus returning in summer 2000 due to a full-scale campaign to spray insecticides to kill mosquitoes. Look how well that worked.

Mosquito-borne illnesses are difficult to control because of the resilience and breeding efficiency of these insects. While there is no evidence that Zika virus affects horses, other mosquito-transmitted viruses such as WNV affect hundreds of horses each year, despite available effective vaccines and annual reminders to horse owners about mosquito control.



More grandiosity ...

A national Sunday newsmagazine supplement recently published an article stating that Good Samaritan laws in every state protect people against liability if they try cardiopulmonary resuscitation (CPR) on a person. The article also went on to state that "you can't be sued for trying [CPR]." Both statements are completely wrong. Kentucky law (for example) does not protect everyone who attempts CPR, and lawyers can sue for anything. Learn how to perform CPR and know the laws and liability protections in your state.

Who is a veterinary "specialist?"

I've seen several websites that tout the sponsoring veterinarian as a "specialist in sport horse medicine" (for example). According to the American Veterinary Medical Association, a veterinary specialist is a veterinarian "who has completed additional training in a specific area of veterinary medicine and passed an examination that evaluates their knowledge and skills..." Considering the rigorous training involved in obtaining "Diplomate" status, veterinary specialists almost always include this in their educational background, such as Diplomate, ACVS for veterinary surgeons, or Dipl. ABVP (Equine) for American Board of Veterinary Practitioners in Equine Practice. The term "specialist" means additional education, training, rigorous examination, and continuing education. Many exceptionally skilled veterinarians have practices that involve primarily sport horses. However, if they are not board certified, they are not "specialists."

Let's talk about "certifications." Business cards or websites for some people boast an impressive list of certifications and letters after the individuals' names. But, are they legitimate, meaningful indications of advanced, specialized education or experience? Or simply that the person paid money for a weekend's worth of training that barely scratched the surface, but resulted in being presented with a "certificate?" Investigate the organization online to determine what training, testing, and "certification" was actually involved. You may be surprised.

Critically evaluate what you read, see, and hear. Ask questions. Assume nothing, and if it is too good to be true, it usually is (but find out anyway).

CONTACT: Dr. Roberta Dwyer; rmdwyer@uky.edu; 859-218-1122

Department of Animal and Food Sciences, University of Kentucky, Lexington, Kentucky

This was published in Lloyd's Equine Disease Quarterly, April 2016, Volume 25, Number 2

Kentucky Mosquitoes

Kentucky's mosquito population, and there is no indication that Zika virus affects equines. However, there are human health concerns. The larvae of

this mosquito can develop in small accumulations of water (as little as ¼ inch deep) in artificial or natural containers. It is an aggressive day biter that is most active in early morning and late afternoon. Usually, it moves only 100 to 300 yards from its breeding site, so breed-

ing-site reduction can be an important aspect of managing this species. Repellents containing DEET are very effective at protecting people from being bitten in late August, when this mosquito is most abundant. **UK**

CONTACT: Dr. Lee Townsend; Lee.Townsend@uky.edu; 859/257-7455; Department of Entomology, University of Kentucky, Lexington, Kentucky.

This was published in Lloyd's Equine Disease Quarterly, April 2016, Volume 25, Number 2

GRAD STUDENT SPOTLIGHT

MELISSA SIARD

From: Knoxville, Tennessee
Degrees and institute where received:
BA in Chemistry, Asbury University,
Wilmore, KY



Melissa Siard participated in summer research at the University of Kentucky Gluck Equine Research Center as part of her undergraduate program requirements. That experience motivated her to pursue her PhD at the Gluck Center under Amanda Adams, PhD, assistant research professor at the Gluck Center. Siard's doctoral program is in veterinary science with an emphasis on equine immunology.

"I appreciate immunology specifically because it is such a broad, multifaceted field that is key to the health and well-being of our animals and ourselves," Siard said.

Her doctoral research focuses on characterizing the contribution of peripheral blood mononuclear cells (PBMC) to inflamm-aging of senior horses. PBMC (which consist of T-cells, B-cells, and monocytes) are critical to the immune system fighting infection. Inflamm-aging is the chronic, low-grade systemic inflammation that occurs in aging horses. The research examines factors related to this occurrence, including determining mechanisms of action, relationships with other health parameters, season/weather, and the impact of anti-inflammatory compounds.

Aside from looking at the "what" and "when" of inflamm-aging, Siard's research also investigates the potential of polyphenols as anti-inflammatory treatments. Polyphenols are phytonutrients, or substances found in certain plants that are believed to be beneficial to health.

"The senior horse population is large and growing, and we want to keep them healthy as long as we can," Siard said. "If effective, curcumin may be able to modulate the inflamm-aging response and mitigate symptoms of age-related diseases such as arthritis."

In addition to her own research, Siard has worked on approximately a dozen other projects, most of which involved the senior horse. Siard said this gave her comprehensive experience and knowledge on senior horse care and organization/management of studies.

In her time at UK, Siard said she learned the importance of communication and initiative, both of which she considers valuable skills in research. In the past year she has been able to take on more of a leadership role when developing contacts, whether it be companies or professors. She identifies concise and thorough communication among everyone involved as vital to the success of research.

Siard said the resources and opportunities at UK (such as conferences and presenting research) have been valuable to her education.

"Nowhere in the world has the extensive research and farm facilities we do, giving us the opportunity to perform well-controlled studies with large numbers of horses to yield good data with statistical power," Siard said.

After completing her degree, Siard plans to pursue a post-doctoral position to gain more research experience before ultimately finding a role as a professor where she can both teach and conduct research. **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.

Thirty-Five Countries Gather for Infectious Diseases Conference in Argentina

More than 400 attendees from 35 countries convened at the 10th International Equine Infectious Diseases Conference (IEIDC X), held April 4-8 in Buenos Aires, Argentina, to present and discuss the latest topics and trends of infectious diseases in all species of equids.

Held every four years in a different country, the conference focuses on emerging, re-emerging, and other frequently encountered infectious diseases that affect equine populations throughout the world.

The conference kicked off with a Practitioners' Day, sponsored by the American Association of Equine Practitioners Foundation, and was followed by a second Practitioners' Day session and the beginning of the "full conference" with the first day of oral abstract presentations.

Oral and poster presentations focused on 10 topics: biosecurity, diagnostics, emerging and re-emerging diseases, gastrointestinal, neurological, other system diseases, parasitology, reproduction, respiratory, and working equids. There was also a special session on the international movement of horses, which was chaired by Peter Timoney, MVB, MS, PhD, FRCVS, Frederick Van Lennep Chair in equine veterinary med-



Infectious Diseases Conference

icine at the University of Kentucky Gluck Equine Research Center, that focused on High Health, High Performance.

The Practitioners' Day sessions offered a broad overview and featured talks about all the topics. A common theme throughout the presentations was that while there is a lot known in the realm of infectious diseases research, there is a lot more unknown and more studies are needed moving forward. Below is a recap of some of the selected presentations from the Practitioners' Day sessions.

Macarena Sanz, DVM, MS, Dipl. ACVIM, PhD, an assistant professor at Washington State University, presented on *Rhodococcus equi* and equine coronavirus.

She gave a brief overview of *R. equi* from selected publications from the past three years. She mentioned one study conducted while she was a doctoral student at the Gluck Center. In that study researchers discovered that foals three weeks or older have a decreased susceptibility to *R. equi*. Sanz said

there is a short window of time to react and treat foals once they are infected. One unanswered question that needs more discovery: What makes one foal susceptible to *R. equi* and another not?

During her equine coronavirus talk, Sanz said there has not been a lot of research documented, but this is one of her currently funded projects that she

Fatality rates are up to 10% in some strangles outbreaks

hopes will provide more data soon.

Andrew Waller, BSc, PhD, head of bacteriology at the Animal Health Trust, in Newmarket, United Kingdom, gave an overview of strangles and its history. Strangles occurs worldwide, except for in Iceland, which has not imported horses for more than 1,000 years. It is the most frequently diagnosed contagious equine disease worldwide, and fatality rates are up to 10% in some outbreaks.

John Prescott, MA, VetMB, PhD, an emeritus professor at the University of Guelph, in Ontario, discussed clostridial enterocolitis. During his talk, he said between 65% and 70% of equine colitis cases have no identified causes and have severe colitis characteristics of toxigenic (clostridial) infections. Moving forward, Prescott said a meta-genomic approach could help characterize the microbes present in colitis feces to identify causative bacteria.

Other topics covered included rotovirus in foals, bacteria, viruses, and placentitis associated with reproductive activity; equine arboviral encephalitides; equine infectious anemia; equine protozoal myeloencephalitis (EPM); equine herpesvirus myeloencephalopathy (EHM); leptospirosis; hepatitis; glanders; salmonella; piroplasmosis; dourine; and equine vaccines and neurologic diseases caused by viruses. The second Practitioners' Day session concluded with three parasitology talks on anthelmintic resistance seen worldwide and the need for more diagnostic surveillance and tools to identify resistant animals.

Plans for the next conference, including the location, will be forthcoming by the end of 2016.

THE GRASS GUIDE

BAHIAGRASS (*PASPALUM NOTATUM*)

Life cycle: Warm-season perennial

Native to: Southern United States

Uses: Pasture

Identification: Folded, sparsely hairy leaves, tapering at the tip, inserted into a flat shaft

Desired for close grazing, bahiagrass is a hardy grass species tolerant of drought and poorly drained soils of any type. It can grow in low fertility soils, as well. Bahiagrass is a good species to use for erosion control in pastures that are severely sloped due to the plant's extensive root system. Bahiagrass' primary limitations are its low forage quality and that it will not survive winters above the southeastern coastal states. **UK**



UNIVERSITY OF ARKANSAS FORAGE ID WEBSITE

The seedheads of bahiagrass



Bahiagrass leaves



Bahiagrass leaf base



For a recap of the social media coverage during the event, see <https://storify.com/JennyEvans/10th-international-equine-infectious-diseases-conf>. **UK**

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

UK Gluck Foundation Seeks Equine Research Hall of Fame Nominations

The University of Kentucky Gluck Equine Research Foundation is pleased to announce the call for nominations to the Equine Research Hall of Fame, which recognizes individuals who have had a distinguished career in equine research.

The Hall of Fame is located at the UK Gluck Equine Research Center. The Hall of Fame was established to honor those individuals who have dedicated their careers to expanding the body of knowledge in some field of equine science through their contributions to basic or applied research. The Hall of Fame is a lasting tribute to those internationally renowned for their endeavors as equine researchers.

All nominations will be submitted to an international review committee comprised of current living members of the Equine Research Hall of Fame, who will recommend to the Foundation's Hall of Fame Committee nominees they consider qualified for this unique distinction. The UK Gluck Equine Research Foundation will announce those selected for induction.

Those eligible for consideration must have contributed very significantly to the field of equine research over an extended period. Nominees can be active, retired, or deceased (posthumous award).

Nomination forms are available by contacting Jenny Evans at jenny.evans@uky.edu. Nominations must be submitted to Evans by email no later than June 6, 2016. **UK**

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

Cicada Emergence This Spring, Little Impact Expected for Kentucky

Brood V of the 17-year periodical cicada (Figure 1), which is comprised of three separate species, is due to emerge this spring. The green-shaded area of the map (Figure 2) shows where they are expected. None of the *Kentucky Pest News* articles from 1999 provided information on activity in Kentucky, but a report by Kritsky et al. (1999) described the brood as "strong" in southeastern Ohio.

There are indications that the western boundary of Brood V in Ohio is at least 10 miles east of its 1914 distribution, and the insects have disappeared from some northern counties. Apparently, small pockets outside of the general brood area can survive for centuries. Therefore, you might see isolated pockets of them along the Ohio River, possibly in Boyd, Greenup, Lawrence, and Lewis counties in Kentucky.



Figure 1. Periodical cicada.

DR. LEE TOWNSEND

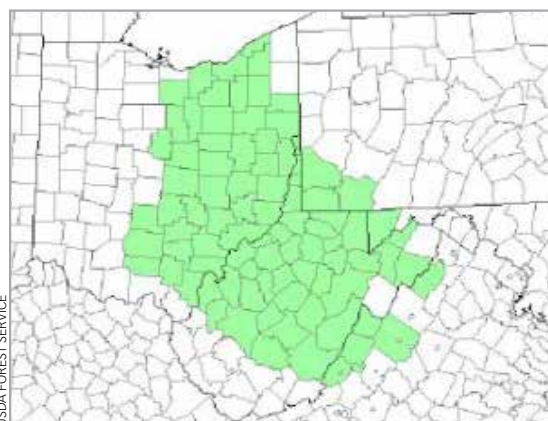


Figure 2. Brood V periodical cicada expected emergence map from 1999 (shaded green)

Learn more at <https://kentuckypestnews.wordpress.com/2016/03/08/periodical-cicadas-in-northeastern-kentucky>. **UK**

>Lee Townsend, PhD, a University of Kentucky College of Agriculture, Food and Environment entomologist, provided this information.

Members of the Equine Research Hall of Fame

1990

W. R. "Twink" Allen – England
John T. Bryans – United States
William Wallace Dimock – United States
Elvis Roger Doll – United States
J. Harold Drudge – United States
O. J. Ginther – United States
Harold Hintz – United States
Frederick Hobday – England
Robert M. Kenney – United States
Peter D. Rosedale – England
Clyde Stormont – United States
Sir Arnold Theiler – South Africa

1991

Philip R. Edwards – United States
Leo B. Jeffcott – England/Australia

1992

Harold E. Garner – United States

1995

Baltus Erasmus – South Africa

2005

Travis C. McGuire – United States
C. Wayne McLwraith – New Zealand

2007

Edward L. Squires – United States

2009

Doug Antczak – United States
I.G. "Joe" Mayhew – New Zealand
Alan Nixon – United States
Peter J. Timoney – United States

2012

Eugene T. Lyons – United States
George P. Allen – United States
Stephanie J. Valberg – United States

2014

Michelle LeBlanc – United States
Ernie Bailey – United States
Elwyn Firth – New Zealand

Preventing Horse-Related Injuries to Humans

Amy Lawyer, MS, equine extension associate in the Department of Animal and Food Sciences at the University of Kentucky, gave a talk regarding Saddle Up Safely and the prevention of horse-related injuries to humans at the 5th Annual UK Equine Showcase, held Jan. 29 in Lexington, Kentucky.

Saddle Up Safely is a coalition of 40 medical, public health, and horse organizations in the United States and Canada involved in raising awareness of horse riding and handling issues and educating equestrians on how to practice safer horsemanship.

In a recent study, researchers found that 14% of individuals in emergency rooms were admitted for a horse-related injury. The actual number of people seen was lower than many other sports, but the percent of people admitted was higher, indicating



In a recent study, researchers found that 14% of individuals in emergency rooms were admitted for a horse-related injury.

ISTOCK.COM

that the chance of receiving a severe injury from horse activity was higher than other sports.

The researchers also found that individuals who were at the greatest risk of a serious injury, medical care that resulted in hospitalization, surgery, or

permanent disability tended to be instructors or professionals. The biggest cause of injuries were from falling from a horse, followed by being kicked by a horse.

Of the 342 people that answered an online survey and shared their stories of personal horse-related accidents, 53% were intermediate riders, followed by

beginner, advanced, professional, and novice. Of those individuals, 28% did not seek medical attention for their horse-related injury, while 26% were hospitalized. A total of 66% of survey respondents said that their accident/injury could have been prevented. The most common cause of injury is due to the horse spooking. Injuries were also caused by broken tack, a saddle slipping, no safety check, and incorrect leading of the horse, all of which could be avoided with safety and horsemanship training.

Lawyer said educational efforts should include teaching people about equine behavior and about how people need to behave around horses; encouraging people to ride or perform activities with horses that are suitable for their own individual ability and training level; educating riders to always perform equipment checks prior to each ride; and not coaxing a green horse into performing a maneuver that is beyond his or her skill set. **UK**

>Alexandra Harper, MBA, is the Operations and Communications Coordinator for the UK Ag Equine Programs.



Nielsen Publishes Three Parasitology Papers in *Equine Veterinary Journal* Issue

Martin Nielsen, DVM, PhD, Dipl. EVPC, ACVM, assistant professor of equine parasitology at the University of Kentucky Gluck Equine Research Center, will have three papers published in the May 2016 issue of *Equine Veterinary Journal*.

The first paper, "Non-strangulating intestinal infarction associated with *Strongylus vulgaris* in referred Danish equine patients," evaluated the role of

the equine bloodworm, *Strongylus vulgaris*, in various types of colic in referred Danish equine patients.

"We used our serum ELISA specific for *S. vulgaris* on several hundreds of samples taken from horses admitted to the veterinary teaching hospital at the University of Copenhagen veterinary school," Nielsen said. "We found a significant association with a certain type of colic involving non-strangulating intestinal infarction. That is dead (necrotic) sections of the intestine, which can be caused by the parasite due to the blood clotting triggered by the migrating bloodworm larvae."



Denmark was chosen as the study site because the bloodworm parasite has been found to be endemic in the horse population there. Nielsen said this is the first study to document this relationship in an epidemiological study.

To read the full-text article, visit ncbi.nlm.nih.gov/pubmed/25604521.

The second paper, "An ultrasonographic scoring method for transabdominal monitoring of ascarid burdens in foals," is aimed at developing and validating a transabdominal ultrasound

KEEP YOUR HORSE IN THE PICTURE.

Although not well-known, *Leptospira interrogans* serovar Pomona can cause devastating problems. *L. pomona* can colonize in the kidneys, be shed in the urine and the horse can become septicemic, which can potentially lead to abortion, uveitis and acute renal failure. LEPTO EQ INNOVATOR[®] is the first *Leptospira* vaccine developed specifically for horses to help prevent leptospirosis caused by *L. pomona*. It also helps prevent infections of the blood, which could, but has not been demonstrated to, help reduce the potential risk of equine recurrent uveitis, abortion or acute renal failure caused by *L. pomona*.^{*} An efficacy trial demonstrated LEPTO EQ INNOVATOR safely helps prevent *L. pomona* infections and urinary shedding.¹ A safety trial showed it was 99.8% reaction-free.^{2,3} To learn more, visit LEPTOEQINNOVATOR.com.

^{*}Currently, there are no vaccines available with USDA-licensed label claims against equine abortions, uveitis or acute renal failure due to *L. pomona*.

¹ Data on file, Study Report No. B850R-US-12-011, Zoetis Inc.

² Data on file, Study Report No. B951R-US-13-043, Zoetis Inc.

³ Data on file, Study Report No. B951R-US-13-046, Zoetis Inc.

Nielsen Publishes Papers

technique for assessing the size of the ascarid burden in foals.

"This is important because a large ascarid burden puts the foal at risk for small intestinal impactions," Nielsen said. "This leads to a very painful colic with a poor to reserved prognosis for survival. We successfully developed the technique and performed some cost-benefit analyses of the potential value of implementing it as a routine screening method on farms."

To read the full-text article, visit ncbi.nlm.nih.gov/pubmed/26122402.

ncbi.nlm.nih.gov/pubmed/26122402.

After each paper was accepted, Nielsen was invited by Celia Marr, BVMS, MVM, PhD, DEIM, Dipl. ECEIM, MRCVS, editor of *Equine Veterinary Journal*, to write an editorial piece to discuss the appropriate treatment for cases of diagnosed *S. vulgaris* and ascarid (*Parascaris* spp.) infections as referenced in the two papers. Nielsen then invited a group of leading scientists with expertise in equine parasitology as well as surgery and medicine to contribute to the article.

"We make evidence-based treatment recommendations for each of the two

scenarios," he said in the editorial.

He added that treating these specifically diagnosed clinical cases is different than typical routine deworming on farms, as the goal is to minimize the risk of adverse reactions in the horse while eliminating the targeted parasite.

To read the editorial, visit <http://onlinelibrary.wiley.com/doi/10.1111/evj.12550/abstract>. **UK**

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



PHOTO COURTESY CHRISTIE OLIVER, KWRI

activities, and coordinating the College of Agriculture, Food and Environment's involvement with various local, state, and federal government agencies and departments. He presents environmental material for the Master Cattleman and Master Stocker Programs, and he managed the Cane Run Watershed Project, which resulted in initial implementation of a watershed-based plan to reduce the effects of non-point source pollution and improve the water quality of the Cane Run in northern Fayette County, Kentucky.

During his time at the University of Kentucky, Higgins has established the University of Kentucky's College of Agriculture and Experiment Station as leaders

Higgins Receives Bill Barfield Award

Stephen F. Higgins, PhD, received the 2016 Bill Barfield Award for Outstanding Contributions in Water Resources Research from the Kentucky Water Resources Research Institute, an organization housed within the University of Kentucky, whose mission covers research, education, training, and technology transfer.

Higgins is the Director of Animal and Environmental Compliance for UK's Agricultural Experiment Station. In this position his responsibilities include research and demonstration on nutrient management, soil conservation, and water quality issues, as well as animal care and safety. He spends his time writing publications for the Kentucky Cooperative Extension Service, providing leadership for the collecting and organizing of data for nutrient management and water quality plans, organizing interdepartmental research

in compliance-related activities and has provided a new way of thinking for managing UK's Experiment Station farms. By publishing extension articles and giving presentations and demonstrations throughout the state, Higgins shares his unique perspective and working knowledge of water quality and nutrient management issues with Kentucky land owners, farm managers, and other stakeholders. His recent projects at the Kentucky Horse Park, Eden Shale, and the Blue Grass Stockyards speak to his continued involvement with guiding best management practices at agricultural businesses that are economically significant to the Commonwealth. **UK**

>Story published by UK's Biosystems and Agricultural Engineering Department within the College of Agriculture, Food and Environment.

UK's Veterinary Science Department Hosts Three-Minute Thesis Competition

The University of Kentucky Department of Veterinary Science hosted its inaugural Three-Minute Thesis (3-MT) competition, where nine PhD candidate (i.e., post-qualifying examination) graduate students presented their research projects on March 31 in the UK Gluck Equine Research Center auditorium.

Daniel Howe, PhD, professor and director of graduate studies in the UK Department of Veterinary Science, said the purpose of the 3-MT competition was to “encourage the students to develop skills in communicating their research in a very concise and efficient manner.”

The rules of the 3-MT, which was 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.).

The presenters, along with their presentation title and advisor, were:

- Emma Adam, “Unique patterns of gene expression in articular chondrocytes: important insight for joint surface lesion repair and cell-based therapies”; Advisor: James MacLeod
- Jennifer Bellaw, “Characterizing the equine ‘nemabio-ome’ using Next-Generation sequencing”; Advisor: Martin Nielsen
- Mariano Carossino, “Dynamics of persistent equine arteritis virus infection in the reproductive tract of carrier stallions”; Advisor: Udeni Balasuriya
- John Eberth, “Dwarfism in miniature horses—Reflections on selection criteria”; Advisors: Teri Lear and Ernest Bailey
- Sarah Elzinga, “Inflammatory and metabolic responses of EMS horses”; Advisor: Amanda Adams
- Carleigh Fedorka, “Biologic therapeutics as a treatment

for endometritis: a novel idea”; Advisor: Mats Troedsson

- Gloria Gellin, “The many faces of leptospirosis”; Advisor: Craig Carter
 - Allison Sparling, “A tale of four unique genes in the horse”; Advisors: Teri Lear and Ernest Bailey
 - Parvathy Thampi, “Role of the skeletal paracrine milieu on interzone cells”; Advisor: James MacLeod
- Three faculty members from the UK departments of Veterinary Science, Animal and Food Sciences, and

Microbiology, Immunology, and Molecular Genetics judged the competition. The top three finishers were Thampi, Fedorka, and Adam.

“We had a great turnout for this first competition, and it is something we will continue for our post-qualifying graduate students in the future,” Howe said.

To see a recap of the social media coverage of the competition, visit <https://storify.com/JennyEvans/uk-gluck-center-three-minute-thesis>. **UK**

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

UNIVERSITY OF
KENTUCKY[®]

COLLEGE OF AGRICULTURE,
FOOD AND ENVIRONMENT
www.ca.uky.edu

UKAg
EQUINE

www.ca.uky.edu/equine
equine@uky.edu

UK Ag Equine Programs




The horse is at the heart of everything we do.

- World-class research in equine health, nutrition, economics, forages and more
- Undergraduate and graduate opportunities and seven student teams and clubs
- Year-round programs and educational materials for horse owners, farm managers and equine professionals





The College of Agriculture, Food and Environment is an Equal Opportunity Organization.

Inaugural UK Equine Nutrition Short Course to be Held May 14

An inaugural University of Kentucky Equine Nutrition Short Course will be held from 8:30 a.m. to 4 p.m. on May 14. The event is for horse owners interested in understanding how nutrition can affect their horses' health and longevity. The event is presented by UK Ag Equine Programs' equine nutrition working group within the College of Agriculture, Food and Environment.

"There has been increasing interest in how feeds and feeding management affect the risk for metabolic and digestive diseases in horses," said event organizer Laurie Lawrence, PhD, a professor and equine nutrition researcher in the college's Department of Animal and Food Sciences. "The nutrition working group has assembled a group of outstanding speakers and innovative, hands-on activities that will give horse owners practical information about desirable and undesirable feeding practices."

UK equine faculty and graduate students, as well as industry practitioners, will present morning session lectures, which will be held at the UK Veterinary Diagnostic Laboratory at 1490 Bull Lea Road, in Lexington. Topics include cracking the code on nutrition-related diseases; equine digestion—colic, ulcers, and other digestive disorders; how calories affect body weight and body condition; what's in horse feed; and horse nutrition myths and mysteries.

Afternoon labs, which will be held at UK's Maine Chance Farm, include pasture plant identification; tapes, weights and body condition; the right feed in the right amount; pasture management; and feeding management tips and tools.

Space is limited. The cost is \$75 and includes lunch. Those interested in attending can register online at <https://UKEquineNutrition.Eventbrite.com>. Registration deadline is May 1.

Through the mission areas of a land-grant institution, UK Ag Equine Programs serves as the front door to equine in the college and represents the breadth of equine offerings at UK and the college's long-term commitment to serving the state's signature equine industry. [UK](#)

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

Upcoming Events

April 30, 9 a.m. – 4 p.m.

Equine Science and Management Alumni Tailgate at Rolex Kentucky Three Day Event, Kentucky Horse Park

May 4-5

31st Annual National Conference on Equine Law, Keeneland, http://128.163.184.63/ukcle/Equine/2016/Equine2016_Brochure.pdf

May 14

Equine Nutrition Workshop for Horse Owners, VDL & Maine Chance Farm, all day, cost is \$75 and includes lunch. Register online at <https://UKEquineNutrition.Eventbrite.com> by May 1.

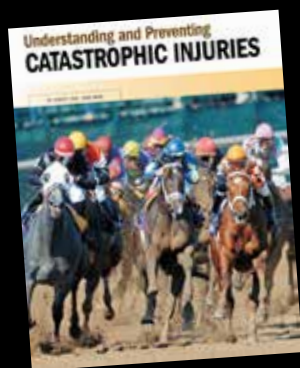
May 17, 6 p.m.

Kentucky Equine Networking Association (KENA) meeting, Fasig-Tipton

June 30, 4 p.m.

UK Department of Veterinary Science Equine Diagnostic and Research Seminar Series, UK Veterinary Diagnostic Laboratory.

Download These ***FREE*** Special Reports Today



■ **Catastrophic Injuries**

■ **Equine Herpesvirus**

Both Sponsored By Zoetis

Others available at

theHORSE.com
YOUR GUIDE TO EQUINE HEALTH CARE

