

Exercised-Induced Inflammation and Injury in Racehorses

When 2010 Horse of the Year Zenyatta crossed the finish line for the last time, most race fans focused on the fact it was the first loss of her career. But what might be even more notable is that it was also her 20th start—unusual in an industry that has seen an overall decline in starts (down to 6.11 per horse in 2010).

One of the reasons researchers propose for this decline is the modern-day Thoroughbred's questionable durability. David Horohov, PhD, William Robert Mills Chair at the University of Kentucky's Gluck Equine Research Center, however, believes the breed is not necessarily becoming more fragile, but rather more susceptible to injury due to breeding strategies, training methods, and increased drug use. During the Veterinary Science Seminar "The Effect of Training and Nutritional Supplementation on Exercise-Induced Pro-Inflammatory Cytokine Gene Expression in 2-Year-Old Thoroughbreds," held March 20 in Lexington, Ky., he explained how we might ultimately be able to identify individuals at-risk for injury and, thus, try to prevent those

injury and training injuries from occurring in the first place.

The statistics in racehorse "wastage" due to injury are shocking: Less than 60% of 2-year-olds in training race, and less than 80% of those continue to race as 3-year-olds, said Horohov. Career-ending injuries are, for the most part, musculoskeletal and include bowed tendons, suspensory ligament injuries, fractures, splints, and osselots (traumatic fetlock joint arthritis), among others.

Horohov presented the theory that these injuries are often the result of mild to moderate damage occurring over time at a rate that exceeds the affected tissues' healing capabilities. He believes if researchers can develop a method to identify at-risk horses based on inflammatory response, they could prevent more injuries.

Inflammation (identifiable by swelling, pain, loss of function, and redness) occurs when tissue signals cells to respond to damage. Even a small amount of tissue damage can trigger this inflammatory response; thus, exercise itself can induce inflammation, Horohov explained. This exercise-induced tissue

damage is part of the musculoskeletal healing and repair process as an individual adapts to exercise.

"While some inflammation is necessary for tissue repair, exaggerated inflammatory responses are likely associated with injury," he said.

In his recent study, Horohov and his colleagues evaluated exercise-induced inflammation in young racehorses in training. He hypothesized that as the horses become better conditioned, their inflammatory responses will de-

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Dr. Horohov's goal is to identify racehorses at risk for injury based on inflammatory response.

Inflammation and Injury

crease and they will eventually reach an anti-inflammatory state. He added a nutritional supplement (by Equine Nutraceuticals) containing antioxidants and anti-inflammatory components as top-dressing to half the study horses' daily rations to determine whether it also helped reduce inflammation.

The study involved 25 2-year-old racehorses in training under one Maryland trainer. In the randomized, double-blind experiment, 12 horses received a placebo top-dressing and 13 received the supplement. All horses trained on a grass track at increasing speed and duration over an eight-week period. The researchers collected blood samples prior to exercise, immediately post-gallop, and two hours after exercise at the beginning of training and again at weeks 2, 6, 7, and 8. They then measured blood samples for lactic acid (which increases fatigue) and malondialdehyde (MDA, an indicator of oxidative damage to membranes) levels as well as pro-inflammatory cytokines (inflammatory mediators) and

lymphokine-activated killer cell activity induced by exercise.

Upon reviewing the results, Horohov observed a time- and intensity-dependent increase in lactate immediately after exercise. "Horses are, in fact, responsive to different intensity exercise," he said. Though not statistically significant, he also observed an MDA increase. The supplement appeared to have minimal effect on the results.

The blood samples taken two hours post-exercise also showed a time- and intensity-dependent increase, this time in inflammatory cytokine expression. Horohov noted that inflammatory response was less in horses given the supplement.

"As training continued, we saw a decrease in pre-exercise inflammatory cytokines (indicating adaption to exercise)," he explained. "The most profound effect was seen in the supplemented horses."

Horohov concluded that exercise results in characteristic changes in cytokine gene expression in acute and late response. He noted that racehorse owners and trainers could potentially use this information to identify successful

adaption to exercise. The supplement appeared to enhance the horses' adaption to exercise, perhaps by reducing inflammation and oxidative damage.

Of note, Horohov said three of the 25 study horses failed to finish the study due to injury. All three completed the third exercise test and developed lameness days later, after subsequent training. These horses all showed a significant increase in cytokine levels two hours post-exercise in comparison to the healthy horses. He noted that this information could be used to monitor horses in training for changes that could indicate impending injury, necessitating a break from training.

Horohov now intends to conduct another study of 100 2-year-olds in training to determine the relationship between cytokine gene expression and occurrence of specific training-related injuries. His ultimate goal is to use this technique to identify horses at risk of injury during training and on the racecourse. **UK**

>Alexandra Beckstett is the associate managing editor of *The Horse: Your Guide to Equine Health Care*.

Updating Equine Influenza

Equine influenza last made headlines in 2007 with the Australia epizootic that affected approximately 50,000 horses. Since eradicated from Australia, equine flu viruses still circulate in much of the world, including the United States. Antigenic drift, which produces new virus strains and gradually undermines existing vaccines' effectiveness, necessitates periodic vaccine updating to combat the new strains.

The vaccine manufacturers look to scientists to advise them on which vaccine virus strains need to be replaced and with what. In 1995 an ad hoc working group of equine flu scientists was founded for just this purpose. Called the Expert Surveillance Panel, this group includes scientists from the OIE (World Organization for Animal Health) reference laboratories for

equine influenza in England, Ireland, Germany, and the United States; other labs specializing in equine flu virus; and the World Health Organization.

Equine influenza in the exposed horse. Researchers at Cambridge University have developed a new technique called "antigenic cartography" that makes these analyses easier. Fortunately, in most years the Expert Surveillance Panel reports that the equine flu

and is typified by strains such as Richmond/07. Some older American strains such as Kentucky/97 are antigenically similar to Richmond/07. The branch called the "Eurasian lineage" circulated mainly from 1990 to 2005.

Because many horses travel internationally, the Expert Surveillance Panel's latest recommendation is that equine flu vaccines should contain strains of both the clade 1 and clade 2 branches. The panel has stopped recommending the Eurasian branch. The original equine flu branch, the A1 subtype represented by Prague/56, has apparently died out.

It is vitally important to the vaccine updating process that equine flu outbreaks are diagnosed properly and that virus specimens are collected by submitting nasal swabs from affected horses to veterinary diagnostic laboratories. From these swabs, scientists can isolate and compare

Scientists now recognize three surviving branches of the equine flu "family tree."

Each year the panel assembles and reviews evidence of equine flu activity worldwide, looking especially for cases of infection in vaccinated horses. It also reviews data comparing flu strains isolated from the past year's outbreaks with flu strains used in vaccines. The critical piece of evidence is how well the antibodies stimulated by vaccination will react with the circu-

vaccines are still working effectively. However, constant surveillance is critical.

Scientists now recognize three surviving branches of the equine flu "family tree," one of which currently circulates in the United States: the Florida clade 1 branch typified by strains such as Ohio/03. The Florida clade 2 branch constitutes the majority of recent isolates from Europe

Updating Equine Influenza

virus strains for their antigenic drift and potentially use them to make the next vaccine strain. Without virus isolates, the whole process of vaccine updating could break down from lack of information, putting even vaccinated horses at greater risk for equine influenza.

Information on collecting and submitting nasal swabs is available at www.ca.uky.edu/gluck/servFlu.asp.

The Expert Surveillance Panel's 2011 report is online at OIE Bulletin, issue 2011 #2: www.oie.int/fileadmin/Home/eng/publications_&_Documentation/docs/pdf/Bull_2011-2-eng.pdf. **UK**

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Fertilization and Pregnancy Loss in Mares

According to Barry Ball, DVM, PhD, Dipl. ACT, the Albert G. Clay Endowed Chair in equine reproduction at the University of Kentucky's Gluck Equine Research Center, there are a variety of potential causes for pregnancy loss in mares. Early pregnancy loss is widely associated with a mare's age, followed by embryo, oviductal, uterine, or endocrine factors, Ball said. Older or multiparous (having foaled two or more times) mares have an increased risk of developing abnormal numbers of chromosomes (aneuploidy, which contributes to embryonic loss) presumably due to a prolonged follicular growth.

"As the mare ages, so do her oocytes," Ball said. Thus, the risk of uterine impairment might result from the mare's normal aging processes.

Fertilization in the mare is a fairly complex process: When the egg matures, the oocyte sheds from the follicle into the oviduct, Ball said. At the time of

ovulation, the cumulus cells surrounding the egg undergo a massive expansion to form a sticky cell mass allowing the egg to adhere to the cilia (microscopic hairs) in the oviduct.

The egg then travels down into the fimbria, a fringe of tissue at the oviduct's opening. A glandular structure called



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Timing of fertilization might help decrease early pregnancy loss.

MASTHEAD

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The Horse: Your Guide to Equine Health Care

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the corpus luteum is organized from cells producing the hormone progesterone, which is needed to establish and maintain pregnancy until the placenta comes into function at about 150 days of gestation.

Sperm are transported to the oviduct initiating fertilization prior to ovulation and, in most cases, are stored there for several days. The sperm remain viable for two or three days in the oviduct, while the egg is only viable for about six hours after ovulation, which makes insemination timing vital, Ball said.

The sperm itself is not capable of initiating fertilization until it has been capacitated in the mares' tract over a short period of time.

"The sperm undergoes a biochemical process close to the isthmus oviduct, which acts to both reduce sperm number and enhance the sperm quality," Ball said.

Following capacitation, the sperm acquire a hyperactive motility allowing sperm-egg contact. The next step is the acrosome reaction, which allows the sperm to provide the enzymes required

Pregnancy loss

to break through the egg. A cortical reaction normally prevents the egg from further fertilization, but a failure in this signal can cause multiple sperm to fertilize the egg, Ball said.

One of the most important causes of embryo loss during early gestation is post-breeding endometritis (failure of the uterus to clear foreign contaminants resulting in inflammation of the inner lining of the uterus). Older mares tend to have a delayed inflammatory response to contaminants, such as semen, but do not show any signs of inflammation other than luminal fluid prior to breeding, Ball said.

The accumulated fluid leads to enhanced inflammation three or four days later, with secondary infection referred to as chronic endometritis, Ball said. Most of these pregnancy losses occur before 20 days of gestation and can also cause fertility-threatening changes, such as periglandular fibrosis (scarring) and uterine lining (endometrium) scarring that affects the embryo's chances of survival, Ball said.

"Always reduce the number of breedings if there is a history of recurrent endometritis," Ball said.

Infectious endometritis results from bacterial invasion (e.g., *Streptococcus*) into the uterus. The bacteria typically enter multiparous mares with poor vulva conformation that doesn't seal properly

and exposes the uterus to bacteria. Acute infectious endometritis might result from impaired uterine defense systems in older mares, which could be compromised over time.

As soon as the egg is fertilized it becomes a zygote, and cell division begins instantly, Ball said. The fertilized embryo remains in the oviduct for six days and then migrates down and enters the uterus.

"Early pregnancy loss in this period we typically identify as prefixation events from Day 6 to 16," he said. "In this period the embryo is very delicate."

According to Ball, loss often occurs in this period due to an imperfect interaction between the embryo and the uterus failing to send the pregnancy signal, so the mare starts cycling again.

Once the embryo enters the uterus, it expands rapidly and usually becomes fixed in one spot within the uterus (generally at the base of a uterine horn) on Day 16 after ovulation. Postfixation events occur from Day 16 on, Ball said. The embryo eventually becomes a fetus at about Day 40, when the placenta usually forms.

Although a mare's age plays a significant role in early pregnancy loss, fertilization timing and early intervention with the aid of modern ultrasound might help decrease its incidence.

Placentitis in Mares

Placentitis (inflammation of the placenta) is another major cause of late pregnancy loss and has a tremendous economic impact on the horse industry, said Ball. Multiparous or older mares are at particular risk of developing placentitis; however, infection can occur in any age at any time of gestation.

While an affected mare can still deliver a foal, it is likely the foal will be aborted late in gestation or be born with septicemia (blood-borne infection). According to Ball, placentitis was responsible for about 20% of late reproductive loss cases in a recent study performed in Central Kentucky.

Ascending bacterial infection of the uterus that enters through the vagina is the most common cause of placentitis. Normally it concentrates at the cervical star, but infection can spread throughout the whole placenta, Ball said. Previous foaling might also have injured the cervix, allowing bacteria access to the placenta.

Many types of bacteria can potentially

STUDENT SPOTLIGHT

ELIZABETH M. WOODWARD

From: Philadelphia, PA

Degrees and institute where received: BS, Equine Science, 2005, Delaware Valley College
PhD candidate, Veterinary Science, 2012, University of Kentucky



Elizabeth Woodward chose to come to the University of Kentucky (UK) Gluck Equine Research Center because of the facilities, faculty, and its reputation for veterinary research. Woodward has focused her research on endometrial inflammation after breeding. She is working toward her doctorate under the supervision of Mats Troedsson, DVM, PhD, Dipl. ACT, director of the Gluck Center and chair of the UK Department of Veterinary Science.

Endometritis is an inflammation of the uterus' interior lining and is a significant cause of infertility in the mare. Woodward said literature suggests about 10 to 15% of mares suffer from this failure in their uterine defense mechanism to eliminate inflammation in a timely fashion and are considered susceptible to endometritis.

It is normal for a transient local inflammatory response to occur after breeding, to clear excess semen and debris accumulated during insemination/breeding, Woodward explains. In most cases the inflammation resolves within two days, allowing for a healthy uterus by the time the conceptus migrates into the uterine body. However, some mares fail to clear the inflammation, develop a persistent breeding induced endometritis (PBIE), and consequently have compromised fertility because the inflammation creates a harmful uterine environment for the embryo, Woodward said.

"Our current project looks at uterine inflammatory gene expression in mares susceptible and resistant to PBIE at several time points within the first 24 hours after breeding," Woodward said. "In addition, we are conducting a study looking into the effects that immune modulation has on endometrial inflammatory gene expression in susceptible mares after treatment with immune modulators.

"I hope that the information obtained from the projects can enhance the understanding of the timing and progression of PBIE," she continued. "With this knowledge, treatment strategies can be improved for the susceptible mare."

Woodward said she wants to stay in the research field and is currently looking for a postdoctoral position.

"I will hopefully pursue a career in academia afterwards," she said. **UK**

> Shaila Sigsgaard is a contributing writer for the Bluegrass Equine Digest.

Pregnancy loss

cause placentitis, such as *Streptococcus* spp. and *Escherichia coli* that are also found in normal mares' vaginas. *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* can cause abortion, too. According to Ball, fungal and viral infections are less common causes of placentitis and tend to occur late in pregnancy.

"All organisms that can cause uterine infections can produce placentitis and acute disease in the mare," Ball said.

The inflammation caused by the bacteria stimulates the tissue to produce prostaglandin, which might lead to uterus contraction and premature labor. Clinical signs of placentitis occur acutely or chronically at any time during gestation, Ball said.

The most common visible signs of ascending placentitis are premature udder development and vulvar discharge, whereas subclinical signs include thickness of the placenta and uterus in the cervical star area. When the placenta becomes thickened and inflamed, there is an increased likelihood it pulls away from the uterine lining, compromising oxygen and nutrient delivery to the foal, Ball said.

The umbilical cord can also cause abortions, according to Ball. Usually the cord is not much longer than about 80 cm, but in the cases of a longer cord there is an increased risk of strangulation or twists that compromise blood flow to the fetus.

"These abortions normally occur in

WEED OF THE MONTH

Common name: Spiny pigweed, Spiny amaranth

Scientific name: *Amaranthus spinosus* L.

Life Cycle: Warm season annual

Origin: Tropical America

Poisonous: No

Spiny pigweed is distributed widely across the United States and grows most frequently along fence borders, feeding and watering areas, and other compacted areas. Spiny pigweed can sometimes infest entire pastures that are overgrazed. Seeds germinate in late spring or early summer. Stems are reddish, stout, and branched. Mature plants can reach three feet tall and are most noticeable in late summer. Sharp spines that inhibit grazing are found in stem axils and are surrounded by a dense cluster of female flowers. The male flowers are long terminal clusters.

Spiny pigweed control is relatively easy and entails applying herbicides to plants less than 12 inches tall.

Mowing and hand weeding are effective if done before flower production to prevent seed formation. Consult your local [Cooperative Extension Service](#) personnel for herbicidal control in your area. **UK**



>William W. Witt, PhD, a researcher in Plant and Soil Sciences, provided this information.

the last months of pregnancy," Ball said.

Nocardioform placentitis

This variation of placentitis has been associated with sporadic incidences occurring particularly in Central Kentucky and Florida, but horses in South Africa and Italy have also been affected. A number of bacteria such as *Crossiella cryophila*, *Crossiella equi*, and

Amycolatopsis are thought to cause nocardioform placentitis, but this is not yet fully understood, Ball said. The infected area of the placenta is usually isolated to a larger area at base of the pregnant horn. Affected placentas are usually covered with brown pus.

"This variation is tricky because there are often no clinical signs of the infection," Ball said.

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Pregnancy loss

Nocardioform placentitis can cause abortion, stillbirth, or foals born alive but compromised. According to Ball, dry, hot summers have been associated with high incidences of nocardioform placentitis. How mares become affected has not been fully determined.

Mare Reproductive Loss Syndrome

A large number of Central Kentucky mares in the early 2000s suffered from mare reproductive loss syndrome

(MRLS). Most mares either aborted or had compromised placentas. The cause of MRLS is not yet fully understood, but it has been suggested that ingesting barbed-haired Eastern tent caterpillars might cause bacterial infection in the mare, Ball said.

Early detection of ascending placentitis is crucial because the signs are not always visible and if/when they become visible, it might be too late for treatment. This is why bacterial placentitis can be difficult to treat successfully. Ball said veterinarians often recommend systemic antibiotics to prolong

the gestation, but these are not always effective in controlling the damage to the placenta.

Ultrasonography is an excellent tool for monitoring fetal and placental changes in mares affected by placentitis. The uterine-placenta thickness or separation can be a sign of placentitis. Measuring hormone levels such as progesterin concentrations can indicate placental abnormalities at certain stages of gestation, Ball said. **UK**

>Shaila Sigsgaard is a contributing writer for the Bluegrass Equine Digest.

UK Launching Equine Study to Develop Nurses' Emotional Intelligence

The University of Kentucky's (UK) Center for Leadership Development, under the direction of Patricia Dyk, PhD, will launch a six-month pilot study in May to assess if Equine Guided Leadership Education (EGLE) helps develop the emotional intelligence of nurses at the UK's Chandler Hospital. The study is a collaborative endeavor between social science researchers from UK's Center for Leadership Development and nursing researchers from UK Chandler Hospital.

"There is an abundance of anecdotal evidence that keeps piling up in dusty files of those who provide equine-assisted learning services which suggests that experiential learning with horses is effective at building competencies," said co-investigator and project lead Lissa Pohl, MA, from the Center for Leadership Development. "However, for this promising field to become even more credible in the eyes of individuals and organizations who want to utilize this powerful way of learning, there needs to be academic research conducted and published in peer-reviewed journals that shows this to be the case."

According to Pohl, the basic premise of equine-guided education is that horses are natural coaches, with an innate ability to interpret and mirror human behavior. Equine-assisted learning experiences are professionally-facilitated horse-human interactions and exercises (not horseback riding) geared to help people develop insights that can be applied in the workplace and in their personal lives.

The six-month study will compare before and after emotional intelligence assessments and qualitative surveys of a control group (up to 20 nurses) and an experimental group (up to 20 nurses) that will experience a one-day equine-guided learning workshop designed to increase their emotional intelligence skills at work.



Equine-guided education's basic premise is that horses are natural coaches, with an innate ability to interpret and mirror human behavior.

Pohl said the intent of the pilot research study is to provide preliminary data on the efficacy of collaborating with horses to teach emotional intelligence and leadership competencies, with the goal of securing funding for larger research projects in the future.

The project is receiving fundraising support from industry partner [Winning with Horse Power](#), a Florida-based global umbrella organization of equine experiential providers.

"Supporting this pilot study is a perfect fit for us," said Eileen Tighe, president and CEO of Winning with Horse Power. "Our members around the world are in many different specializations, but using equine-guided experiences to develop emotional intelligence is integral to all of them."

For more information about the project, contact lissa.pohl@uky.edu or 859/257-2748. **UK**

Source: edited Equine Guided Leadership Education news release

WHEN 7,766 VETERINARIANS SPEAK, WE LISTEN.

The American Association of Equine Practitioners (AAEP) published a comprehensive list of “core” vaccines, which all horses should receive, and “risk-based” vaccines, which benefit horses with particular risk profiles. When it’s time to choose

the best regimen for horses under your care, nobody offers a wider range of tested, trusted vaccines than Pfizer Animal Health.

Talk to your Pfizer Animal Health representative today or visit pfizerah.com



Core Vaccines: West Nile-Innovator® helps provide duration of immunity against West Nile virus for at least one year.

West Nile Innovator®	West Nile	Eastern/Western Encephalomyelitis Sleeping Sickness	Tetanus
WEST NILE-INNOVATOR®	●		
WEST NILE-INNOVATOR® + EW	●	●	
WEST NILE-INNOVATOR® + EWT	●	●	●
WEST NILE-INNOVATOR® + VEWT*	●	●	●

Risk-Based Vaccines: Fluvac Innovator® EHV-4/1 contains both **EHV-1** and **EHV-4** to help protect against Rhinopneumonitis.

Fluvac Innovator®	Equine Influenza Flu	Rhinopneumonitis (EHV-4/EHV-1) Herpesvirus	<i>Streptococcus equi</i> Strangles	Eastern/Western Encephalomyelitis Sleeping Sickness	Tetanus
FLUVAC INNOVATOR®	●				
FLUVAC INNOVATOR® EHV-4/1	●	●			
FLUVAC INNOVATOR® 4	●			●	●
FLUVAC INNOVATOR® 5	●	●		●	●
FLUVAC INNOVATOR® TRIPLE-E® FT*	●			●	●
PINNACLE® I.N.			●		
EQUIVAC INNOVATOR® EHV-4/1		●			

*Venezuelan Equine Encephalomyelitis virus has a geographical distribution restricted predominantly to Central and South America, although U.S. incursions have occurred, and the risk of introduction persists.
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Grayson-Jockey Club Funds Immune Response to Vaccination Study

The Grayson-Jockey Club Research Foundation will fund a study titled “Do Non-Steroidal Anti-Inflammatory Drugs affect the Immune Response to Vaccination in Horses?” for one year. David Horohov, PhD, William Robert Mills chair and professor at the University of Kentucky Gluck Equine Research Center, is the study’s principle investigator.

Veterinarians sometimes prescribe non-steroidal anti-inflammatory drugs (NSAIDs) prior to a vaccination to reduce a horse’s chances of having an adverse reaction to that vaccination. Horohov observed that the reasoning behind this “might

seem sound,” but some veterinarians are concerned the NSAIDs might have the unintended consequence of actually impeding the horse’s immune system’s ability to respond to the vaccination as intended.

This project will evaluate NSAIDs’ effect on a horse’s ability to benefit from a commercial influenza vaccine. The



ANNE M. EBERHARDT

This project will evaluate NSAIDs’ effect on a horse’s ability to benefit from a commercial influenza .

results will help veterinarians and horse owners make more informed decisions regarding NSAID use when vaccinating.

The Grayson-Jockey Club Research Foundation will fund 16 projects in 2012, totaling \$845,646. To read about the other projects, visit www.grayson-jockeyclub.org/grantsDisplay.asp?section=4. **UK**

Source: edited press release

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Dr. Lawrence has built a nationally respected equine nutrition research program

UK’s Laurie Lawrence Receives Provost’s Distinguished Service Professorship Award

Laurie Lawrence, PhD, professor in the department of animal and food sciences at the University of Kentucky (UK), was recently awarded the Provost’s Distinguished Service Professorship, which honors a consistently high level of achievement in contributions to academic disciplines and the university.

Lawrence came to UK in 1992 and has built a nationally respected program in equine nutrition research, which has addressed a number of key nutritional issues impacting the horse industry. Having contributed to more than 80 peer-reviewed journal articles, 21 book chapters, and more than 80 popular or professional publications and reports, she has been recognized with some of the most prestigious awards in her profession. Among these honors are the American Society of Animal Science’s Fellow Award, an Equine Science Award, and the American Feed Industry Association Nonruminant Nutrition Award. In addition she is a recipient of the Thomas Poe Cooper Award for Research, the highest honor in the College of Agriculture. Lawrence is one of the top scientists in the country that trains equine nutritionists. She has advised 31 masters students and 13 doctoral students and been invited to present at more than 125 presentations nationally and internationally.

Lawrence has been involved with UK’s Ag Equine Programs since its inception as the Equine Initiative in 2005. **UK**

Source: adapted from award nomination packet materials

Gluck Center Researchers to Speak at KER Conference

Martin Nielsen, DVM, PhD, Dipl. EVPC, assistant professor at the University of Kentucky Gluck Equine Research Center, and Amanda Adams, PhD, assistant professor at the Gluck Center, will speak at the 18th Kentucky Equine Research (KER) Conference May 17-18 at the Embassy Suites Hotel in Lexington, Ky.

Nielsen will speak on May 17 about "Sustainable Equine Parasite Control," and Adams will speak the following day about "Equine Metabolic Syndrome: Challenges and Advances."

Nielsen and Adams are among a expert panel of invited speakers. Other speakers include:

- David Pugh, DVM, MS, Dipl. ACT, ACVN, Auburn University
- Ramesh C. Gupta, DVM, PhD, Dipl. ABT, Murray State University
- Amelia S. Munsterman, DVM, MS, Dipl. ACVS, CVECC, Auburn University
- Alan J. Ruggles, DVM, Dipl. ACVS, Rood & Riddle Equine Hospital
- Stephen M. Reed, DVM, Dipl. ACVIM, Rood & Riddle Equine Hospital

Visit KER.com for more conference information. **UK**

>Jenny Blandford is the Gluck Equine Research Foundation Coordinator at the Gluck Center.

UPCOMING EVENTS

May 17

Kentucky Equine Networking Association (KENA) Meeting; networking 6 p.m., dinner 6:30 p.m., at Clarion Hotel, Lexington.

May 31, 4 p.m.

Department of Veterinary Science Equine Diagnostic Research Seminar Series, Veterinary Diagnostic Laboratory, Martin Nielsen, DVM, PhD, Dipl. EVPC, will speak about equine parasites.

May 31, 4-8 p.m.

Fourth Annual Equine Farm and Facilities Expo, Margaux Farm, Midway, Ky.

June 5, 4-8 p.m.

Inaugural Western Kentucky Equine Field Day, Darling 888 Ranch, Princeton, Ky.

June 14-15

4-H State Horse Contest, Clarion Hotel, Lexington, Ky.

June 30-July 7

Kentucky State 4-H Horse Show, Kentucky Expo Center, Louisville

jenny.blandford@uky.edu or 859/218-1089. **UK**

>Jenny Blandford is the Gluck Equine Research Foundation coordinator at the Gluck Center.

Gluck Releases Third Research Report

The University of Kentucky Gluck Equine Research Foundation published its 2011 Research Report in late March of this year. The Research Report 2011 focuses on the University of Kentucky Maxwell H. Gluck Equine Research Center faculty's research accomplishments and scientific publications during the 2011 calendar year.

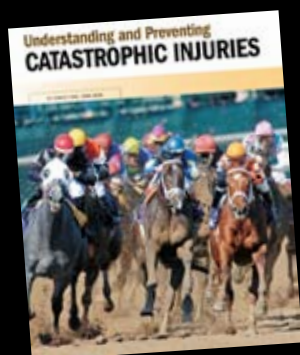
The Research Report is divided into seven sections (genetics and genomics, immunology, infectious diseases, musculoskeletal science, parasitology, pharmacology/toxicology, and reproductive health) and includes faculty members' educational backgrounds, interests,

projects, and graduate students. It also lists research technicians/assistants and visiting scientists in 2011.

The Research Report also covers Gluck Equine Research Center grants, scientific publications including books/book chapters, refereed journal articles, nonrefereed journal articles, and seminars and papers presented. The report also recognizes individuals and organizations that donated money to the Gluck Foundation in 2011.

The Research Report is available online at www.ca.uky.edu/gluck or at www.ca.uky.edu/equine. For more information contact Jenny Blandford at

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YOUR GUIDE TO EQUINE HEALTH CARE



UK Ag Equine Programs presents

4th Annual Equine Farm & Facilities Expo



Thursday, May 31, 2012

4 - 8 p.m.
MEAL PROVIDED

Margaux Farm, LLC

596 Moores Mill Rd.
Midway, Kentucky 40347

Wagon tours of the farm 4 - 5:30 p.m.

Field demonstrations 6 - 8 p.m.

THE EXPO WILL HIGHLIGHT COMPANIES throughout the central bluegrass displaying equine equipment and supplies as well as a variety of informational booths staffed by UK specialists.



Margaux Farm, LLC, is a leading Thoroughbred breeding operation focused on producing sound and durable top-quality racehorses. Margaux Farm stands several stallions, including five-time Grade 1 Winner Devil His Due. It is managed by 2001 Kentucky Thoroughbred Farm Managers' Club President and 2003 Farm Manager of the Year Steve Johnson.



DIRECTIONS from Lexington



- Take Leestown Rd. North
- 6.6 miles past Masterson Station Park, turn right on Moores Mill Road
- Follow the signs to the farm

UK demonstrations

- Selecting the Right Feed — DR. LAURIE LAWRENCE
- Tall Fescue: Friend or Foe — DR. RAY SMITH
- Muck Management and Herbicides —
DR. BILL WITT AND DR. J.D. GREEN
- Field Renovation Options: Round-up Ready Alfalfa®,
Teff and Others — DR. GARRY LACEFIELD

RSVP appreciated to
Woodford County Extension Office
(859) 873-4601
dL_CES_woodford@email.uky.edu

