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Gluck Equine Research Center Celebrates 25 Years

The world-renowned Maxwell H. Gluck Equine Research Center is celebrating 25 years as a named center focused on improving the health and well-being of the horse. Positioned within the Department of Veterinary Science in the University of Kentucky's



College of Agriculture, the Gluck Center is the only scientific institute in the United States where virtually all faculty conduct full-time

research on equine health and diseases.

The Department of Veterinary Science faculty developed six of the 10 major vaccines currently used to protect against equine infectious diseases. They are among a long list of accomplishments with an international impact on equine research.

"The Gluck Center opened its doors 25 years ago, due to the generosity of Maxwell and Muriel Gluck and the horse industry," said Mats Troedson, DVM, PhD, Dipl. ACT, ECAR, director of the Gluck Center and chair of the Department of Veterinary Science. "Landmark discoveries have been made in vaccine research and production,

development of diagnostic tests for infectious diseases, drug detection in racing and performance horses, sequencing of the equine genome, identification and detection of genetic diseases and traits, parasite control, and reproductive health and management."

The Department of Veterinary Science, established in 1915, has a long history of distinguished service. The Gluck Center capitalized on the department's strong foundation to reach major international equine research milestones, including:

- Developing diagnostic serological tests for contagious equine metritis (CEM), Tyzzer's



UK's Gluck Equine Research Center

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disease, equine protozoal myeloencephalitis (EPM), equine herpesvirus myeloencephalopathy, strangles, and equine viral arteritis;

- Developing enzyme-linked immunosorbent assay (ELISA) test for drug detection;
- Demonstrating the usefulness of artificial lights and progesterone/estradiol treatments for hastening the onset of the breeding season;
- Determining the genetic basis for and developing tests for certain coat color trait inheritance;
- Providing leadership in the sequencing of the complete horse genome and structural characterization of horse genes; and
- Being a key part of a College of Agriculture team that performed the definitive experiments identifying the cause of mare reproductive loss syndrome.

Gluck Center faculty continues to conduct equine research in six targeted areas: genetics/genomics, pharmacology/toxicology, infectious diseases and immunology, musculoskeletal science, parasitology, and reproductive health.

The Gluck Center is also a World Organisation for Animal Health (OIE)-designated reference laboratory for equine rhinopneumonitis, equine influenza, and equine viral arteritis.

“We are facing continuous and new challenges in equine health and well-being with the threats of new emerging infectious diseases, bacterial resistance to antibiotics as well as parasite resistance to dewormers, stricter regulations on medication for race and performance horses, an anticipated flow of genetic information

25 YEARS OF MILESTONES

In celebration of the University of Kentucky's (UK) Maxwell H. Gluck Equine Research Center's 25th anniversary in 2012, a monthly “Milestones” feature in the *Bluegrass Equine Digest* will highlight equine research at the Gluck Center that has been fundamental to the equine industry. The Gluck Center, along with the UK Veterinary Diagnostic Laboratory (UKVDL) and the Animal Genetics Testing & Research Laboratory (AGTRL) is part of the Department of Veterinary Science, which was established in 1915. Prior to the Gluck Center, the Department of Veterinary Science had a long history of distinguished service. The Gluck Center capitalized on this strong foundation to reach major equine research milestones:

1983: Mr. and Mrs. Maxwell H. Gluck, owners of Elmendorf Farm, conveyed to the University an interest in providing a memorial to Maxwell Gluck. It was suggested that they might find an equine research institute suitable.

1986: Construction began on the Maxwell H. Gluck Equine Research Center building, which was completed in 1987.

1987: James R. Rooney was appointed head of the Department of Veterinary Science.

1988: The Department of Veterinary Science developed and released the first ELISA (enzyme-linked immunosorbent assay) test for drug detection in equine athletes.

1989: Peter J. Timoney was appointed head of the Department of Veterinary Science.

1993: The Office International des Epizooties (the animal equivalent of the World Health Organization) designated the Maxwell H. Gluck Equine Research Center as a world reference center for three significant equine viral diseases: equine rhinopneumonitis (equine herpesviruses 1 and 4); equine influenza; and equine viral arteritis. **UK**

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

through the sequencing of the equine genome, debilitating musculoskeletal injuries in the equine athlete, and imminent threats to equine breeding industries by reproductive diseases and abortions,” Troedsson said. “The Gluck Center is well prepared for these challenges and will continue to play an important role in the horse and veterinary communities. We are looking forward

to the next 25 years with confidence.”

Several events are scheduled in conjunction with the 25th anniversary, starting off with the inaugural UK Ag Equine Programs' UK Equine Showcase and 3rd Annual Kentucky Breeders' Short Course at the UK Veterinary Diagnostic Laboratory held in January and the grand opening of the UK Gluck Center Equine Reproduc-

WEED OF THE MONTH

Common name: Yew, *Taxus*
Scientific name: *Taxus* species
Life Cycle: Perennial
Origin: Many countries
Poisonous: Yes, extremely



Taxus

Taxus species, frequently called “yew,” are used as ornamentals in much of the eastern United States and Canada. Generally, these evergreen plants are found in highly managed landscapes. *Taxus* plants thrive under many conditions, which make them a popular choice among gardeners and landscapers. Small and large horse farm owners might plant them without realizing their toxicity to horses.

Taxus leaves, bark, wood, and seeds are poisonous to horses. Poisoning might occur from animals eating plants or pruned plant parts left on the ground. If horses consume large amounts, they can succumb to death within a short time and without additional clinical signs. Thus, animals are often found close to plants they have eaten, sometimes with plant parts in their mouth. In less severe cases, typical clinical signs include trembling, labored breathing, and collapse.

Remove *taxus* plants from horse farms to avoid the possibility of horses eating them. Dig the plant and remove it from the farmstead. Consult your local Cooperative Extension Service personnel (www.csrees.usda.gov/Extension) for specific identification and control in your area. **UK**

William W. Witt, PhD, a researcher in the University of Kentucky Plant and Soil Sciences Department, provided this information.

tion Facilities at Maine Chance Equine Campus in February. Future events include:

- Gluck Center rededication celebration July 12 at the Gluck Center
- Equine Research Hall of Fame in fall 2012

The Gluck Center’s mission is scientific discovery, education, and dissemination of knowledge for

the benefit of the health and well-being of horses.

Groups or individuals wishing to tour the Gluck Center should contact Jenny Blandford at jenny.blandford@uky.edu or 859/218-1089. For more information, visit www.ca.uky.edu/gluck. **UK**

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

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UK's Equine Initiative Renamed UK Ag Equine Programs

The University of Kentucky's (UK) Equine Initiative has changed its name to UK Ag Equine Programs. The name change was undertaken by the College of Agriculture in consultation with its internal and external stakeholders to better reflect the breadth of equine offerings at UK and the college's long-term commitment to serving the state's signature equine industry.

The Equine Initiative was launched in 2005 when the College of Agriculture set out to radically change how it served Kentucky's equine industry and provide a suite of services appropriate for a land-grant university. In a nod acknowledging the success of those efforts and a continued commitment to the state's equine industry, the college has adopted a new name to better position its equine programs for continued success.

"In short, we have indeed transformed the 'initiative' into established, world-class, service-oriented programs across the board," said Nancy Cox, PhD, UK College of Agriculture associate dean for research, Kentucky Agricultural Experiment Station director, and administrative leader for the UK Ag Equine Programs.

Norm Luba, executive director of the North American Equine Ranching Information Council and chair of the College of Agriculture's equine



advisory committee, echoed that sentiment.

"With remarkable efficiency, the University of Kentucky has delivered on its promise of initiating a diverse portfolio of equine research, teaching, and service programs," he said. "The UK Ag Equine Program is now a permanent resource to the Kentucky horse industry, as well as poised to benefit an international horse industry that looks to Kentucky as the horse capital of the world."

"The name change reflects the broad nature and many areas of expertise, across many departments, of our equine programs at UK," said Ed Squires, PhD, Dipl. ACT (hon.), director of UK Ag Equine Programs and executive director of the UK Gluck Equine Research Foundation. "We continue our commitment to be a world leader and premier resource for the equine industry."

Before UK formed the Equine Initiative, it already had in place a long and storied legacy of world-class equine health and nutrition research, as well as a handful of successful outreach programs targeted to horse owners. But, despite being located in the "horse capital of the world," there wasn't a dedicated undergraduate degree

in equine studies. There was also no focal point that would allow the public to access all of the college's top-notch equine work.

Thus, the university launched a four-year, stand-alone undergraduate degree in equine science and management, created an internship program, hired equine-focused faculty and staff, and created new outreach programs, such as the Horse Pasture Evaluation Program. The college also formed partnerships with other equine organizations and state institutions of higher education.

Seven years later, the undergraduate program has more than 220 equine students enrolled, with half of them coming to Kentucky from out-of-state to pursue their interests in equine undergraduate education and subsequent career opportunities. Thirty-nine graduates and 94 students completed required internships during that time. New research has been undertaken in areas ranging from equine health to economics.

The college has held several events, including a series of equine-specific field days, an equine research showcase, a series of short courses, equine career fairs, and a distinguished lecture series featuring equine industry leaders. Additionally, the program launched an online monthly newsletter about UK equine research that now reaches more than 45,000 monthly subscribers.

More about UK Ag Equine Programs can be found online at www.ca.uky.edu/equine. UK

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

STUDENT SPOTLIGHT

To highlight equine research projects by graduate and doctorate students in the University of Kentucky College of Agriculture, the Bluegrass Equine Digest newsletter features a different student's work in each issue.



Sanjay Sarkar

From: Kolkata, India

Degrees: PhD candidate, UK Gluck Equine Research Center

Bachelor of Veterinary Science and Animal Husbandry (equivalent to DVM), West Bengal Animal and Fishery Sciences (WBUAFS), Kolkata, India

Masters in Veterinary Pathology, WBUAFS

One of the reasons Sanjay Sarkar chose to continue his education at the University of Kentucky's Gluck Equine Research Center was the opportunity to pursue higher studies in virology.

"I became interested in Dr. Thomas Chambers' (PhD, professor of veterinary virology at the Gluck Center) research work at Gluck," he said.

Sarkar is currently conducting a research project on equine herpesvirus (EHV-1). EHV-1 infection has two forms: One causes abortion in mares, and the other causes respiratory infection and occasionally neurologic signs. The initial clinical signs of infection might be nonspecific and include fever. Other presenting signs might include combinations of fever, nasal discharge, cough, and respiratory signs. The virus can be highly contagious, endemic, and spreads primarily through direct horse-to-horse contact.

"I am trying to characterize the type-I interferon (IFN) response against equine herpesvirus-1 infection in the cell culture model," Sarkar said.

Horses pick up the virus through their respiratory system. The virus first replicates in the respiratory epithelium and then spreads through the circulatory system. Sarkar said the cell culture model can be used as a model for the horse.

In his research, Sarkar grows the virus in different cell lines, such as vero cells, MDBK (Madin-Darby bovine kidney) cells, equine endothelial cell (EEC), and equine dermal cells.

"To grow equine herpesvirus, I use equine endothelial cell in DMEM (Dulbecco's Modified Eagle Medium) cell culture media with 10% fetal bovine serum," he said. "My study will reveal how EHV-1 evades the type-I IFN mediated host innate immune response and also identify the viral genes that are responsible for the immune evasion."

Sarkar hopes his research will shed light on how EHV-1 causes disease in horses.

"The information may eventually be helpful in targeting new therapeutics," he said. Sarkar hopes to continue his research through postdoctoral training in the field of virology. [UK](#)

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

EQUINE REPRODUCTION FACILITIES OPEN AT UK'S MAINE CHANCE EQUINE CAMPUS

A grand opening celebration for the University of Kentucky's (UK) Equine Reproduction Facilities was held Feb. 2 at UK's Maine Chance Equine Campus. The celebration recognized the generosity of supporters who funded the remodeling.

The remodeled facilities, consisting of two state-of-the-art barns with laboratories, will help UK's Maxwell H. Gluck Equine Research Center faculty develop the best equine reproductive research program in the country and give the Center, an affiliate of UK's Ag Equine Programs, better opportunities to match the signature equine industry it serves. The mare facility and separate stallion facility will be used for reproductive health studies. Laboratory facilities have



The remodeled facilities include two state-of-the-art barns with laboratories.

been constructed for handling semen, embryos, and reproductive tissues.

Lexington is often viewed as the epicenter of the state's equine industry, and as such, reproductive health is of top concern to industry stakeholders.

"This reproductive lab is evidence of the vision of many stakeholders who encouraged UK to provide research worthy of what is arguably the Thoroughbred reproduction center of the world," said Nancy Cox, associate dean for research at UK's College of Agriculture, Kentucky Agricultural Experiment Station director, and administrative leader for UK Ag Equine Programs. "We are fortunate to have the leadership of Dr. Mats Troedsson (DVM, PhD, Dipl. ACT, ECAR, chair of the Department of Veterinary Science and director of the Gluck Equine Research Center) and his new team of reproductive researchers to implement this vision in this 21st century facility."

Major donors who supported remodeling the facilities included area horse farms and organizations, as well as notable equine veterinarians. Donors include: diamond sponsors Lisa and Robert Lourie and Shadwell Farm; platinum sponsors Ashford Stud, Darley USA, Flaxman Holdings Limited, G. Watts Humphrey Jr., Kentucky



Major donors included area farms, organizations, and veterinarians.

Thoroughbred Association/Kentucky Thoroughbred Owners and Breeders, and Walter W. and June Zent; gold sponsors William D. Fishback Jr., Kevin B. Pfeister, and Tom Riddle; silver sponsors Stuart E. Brown II, Ed Squires, and Mats Troedsson; and bronze sponsors Butler Animal Health, Ed Fallon, Luke Fallon, Hancock Farm, Kristina Lu, and Peter Morresey.

Funds donated by stakeholders were matched through UK's research challenge trust fund.

"Bringing state-of-the-art laboratory facilities to the horses at Maine Chance Equine Campus will help us address clinical equine reproductive health and fertility issues of importance to the horse industry," Troedsson said.

"This is truly a team effort between veterinarians, breeding farms, the University of Kentucky College of Agriculture, and the state of Kentucky," said Squires, director of UK Ag Equine Programs and executive director of the Gluck Equine Research Foundation.

Areas of reproductive health research at the Gluck Equine Research Center include causes, diagnosis, and treatment of embryonic and fetal loss in mares; early embryonic development; uterine infection; nutritional effects on reproduction; stallion behavior; diagnosis and

(REPRODUCTION FACILITIES ...)

treatment of fertility problems in stallions; and fescue toxicosis.

Other issues being addressed include pregnancy losses, high-risk pregnancies, and methods to enhance mares' and stallions' fertility.

For more information about the Gluck Equine Research Center, visit www.ca.uky.edu/gluck. **UK**

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

ALLEN PAGE PRESENTS EPE RESEARCH AT AAEP

Allen Page, DVM, a PhD candidate at the University of Kentucky's Gluck Equine Research Center, presented his recent studies on equine proliferative enteropathy (EPE), an emerging young horse disease caused by *Lawsonia intracellularis*, during a presentation at the 2011 American Association of Equine Practitioners convention, held Nov. 18-22 in San Antonio, Texas.

Page, along with other researchers in the lab of David Horohov, PhD, William Robert Mills chair and professor at the Gluck Center, used a newly developed assay and made great strides in understanding *L. intracellularis*' environmental prevalence on certain horse farms compared to its seroprevalence (presence of positive serum antibodies) in horses residing on those farms.

EPE has been reported worldwide and is gaining prevalence in the United States. *L. intracellularis* invades intestinal crypt cells, primarily in

the small intestine, and causes thickening of the intestinal lining. This thickening leads to clinical signs such as anorexia, weight loss, reduced daily weight gain, fever, lethargy, depression, peripheral/ventral edema (fluid swelling), and sometimes colic and diarrhea. Reduced daily weight gain and weight loss can be a costly problem for many Thoroughbred breeders, as smaller foals tend to bring lower prices at auction. The current lack of definitive diagnostic tests is another frustration for breeders and veterinarians alike.

“The data suggests that lower environmental burdens of *L. intracellularis* result in fewer horses being exposed to the bacterium and less antigenic stimulation per exposure.”

Dr. Allen Page

Recently, Page and a team of researchers developed a modified enzyme-linked immunosorbent assay (ELISA) test that detects antibodies to *L. intracellularis*—the first serologic assay able to detect the antibodies and, thus, *L. intracellularis* exposure. Using this test, the team evaluated the seroprevalence of *L. intracellularis* among 337 Thoroughbred foals and weanlings residing on 25 Central Kentucky farms.

“Case information from the three years preceding the study was used to classify farms as having no prior recent history of EPE, a suspected history of EPE, or a confirmed history of

EPE,” he explained. Then, from August 2010 to January or February 2011 (the study officially ended in January, but some farms opted to have foals tested in February as well), the research team collected monthly serum samples from the aforementioned foals, testing them for *L. intracellularis*-specific antibodies.

Upon reviewing the findings, Page and his colleagues found an overall seroprevalence of 68%, with seroprevalence levels on individual farms ranging from 14-100%. Page was quick to point out that the overall seroprevalence of 68% isn't likely representative of the Central Kentucky Thoroughbred population, due to the large number of previously affected farms included in the study. Other key findings included:

- All farm populations had evidence of *L. intracellularis* exposure, regardless of whether they had logged previous cases of EPE;
- On average, the *L. intracellularis* seroprevalence was significantly lower on farms with no history of EPE cases than on those with confirmed or suspected EPE cases; and
- Horses residing on farms with no history of EPE cases tended to have lower *L. intracellularis* antibody levels.

“Using an ELISA to detect serum antibodies to *L. intracellularis* from young horses on numerous farms, seroprevalences corresponded well with past history of EPE cases,” Page concluded. “The data presented here suggests that lower environmental burdens of *L. intracellularis* result in fewer horses being exposed to the bacterium

(EPE RESEARCH ...)

and less antigenic stimulation (promoting an immune response) per exposure.”

The findings in the study correlated well with EPE diagnoses made by local veterinarians, Page added.

With the development of the first serologic test to identify the presence of *L. intracellularis* antibodies, Page et al. have found a way to measure exposure to the causative bacteria. His study also revealed that while all farms included had evidence of *L. intracellularis* in the environment, the seroprevalence of the bacteria in horses residing on those farms ranged from 14-100%. Further research is needed to find a possible explanation for the farm-to-farm difference in *L. intracellularis* seroprevalence. **UK**

Erica Larson is the news editor at The Horse.

EARLIER PASTURE GROWTH IN 2012: IMPLICATIONS FOR TALL FESCUE AND PREGNANT MARES

In Kentucky and surrounding states, winter has been abnormally mild. Thus, most cool season pasture grasses have not had a real dormancy period. Unless there is a late cold spell, we expect pastures to “green-up” earlier this year.

This should benefit owners whose horses can start grazing greener pastures earlier in the year; however, it might cause problems for owners grazing pregnant mares on pastures containing tall fescue. Normally, fescue toxicity is not

MILD WINTER IMPACTS WEED EMERGENCE

Kentucky’s mild winter weather and excellent soil moisture have resulted in rapid growth of many cool-season weeds this year. Weed growth is currently about three to four weeks ahead of “normal” development. This means pasture managers need to scout fields now and be prepared to initiate control tactics sooner than normal.

Henbit (www.TheHorse.com/15477), purple deadnettle (www.TheHorse.com/15477), chickweed, and musk thistle (www.TheHorse.com/14418) are examples of weeds growing rapidly. Star-of-Bethlehem (www.TheHorse.com/18059)—a plant rarely seen this early in the year—has emerged as well and is already two to four inches tall. Consult your local Cooperative Extension Service personnel (www.csrees.usda.gov/Extension) for specific identification and control options in your area. **UK**

W. W. Witt, PhD, and J. D. Green, PhD, faculty members in the department of plant and soil sciences at the University of Kentucky, provided this information.



Star-of-Bethlehem, which is rarely seen this early in the year, is already two to four inches tall.

a concern in Kentucky between mid-December and late March or early April because ergovaline (an alkaloid produced by a fungus that lives inside the plant) is low during winter. With earlier green-up likely, pregnant mares could begin showing clinical signs of fescue toxicity (e.g., prolonged gestation; absence of milk production; foal and mare mortality; tough, thickened,

or retained placentas; weak and immature foals; reduced serum prolactin levels; and reduced progesterone levels) as early as March. Therefore, exercise extra caution before turning out pregnant mares on pastures containing fescue. **UK**

Ray Smith, PhD, a professor and forage extension specialist at the University of Kentucky, provided this information.

UKVDL Provides Equine Leptospirosis Abortion Update

This reproductive season (June 2011 to present) the University of Kentucky's Veterinary Diagnostic Laboratory (UKVDL) has confirmed 21 cases (as of Feb. 17) of equine leptospiral abortion in the Central Kentucky region. This is the highest number of cases seen by the laboratory since diagnosing 31 cases in 2009-2010 and 40 cases in 2006-2007. Both prior outbreaks coincided with increased rainfall.

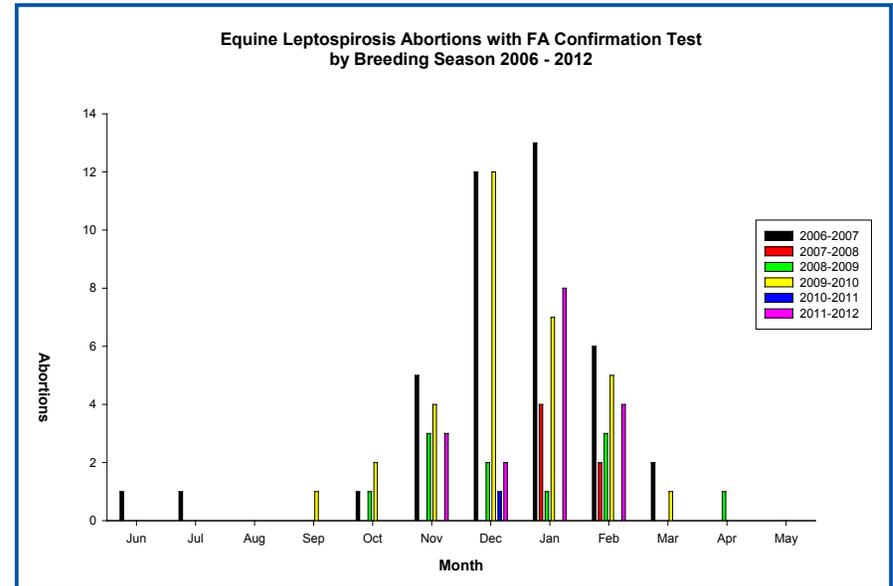
The total number of cases in Kentucky is unknown, but the UKVDL receives a high percent of abortions that occur in the Bluegrass region.

Equine leptospirosis is a bacterial disease found worldwide that affects many species, including horses and people. The source of the bacteria is the urine of wild animals including mice, squirrels, fox, skunks, opossums and deer. Other domestic species such as cattle, dogs, and pigs can also be sources of infection. Horses are infected when bacteria enters through the skin or mucosal membranes of the eye or mouth by contact with blood, urine, or tissues from infected animals. This infection can also occur when horses splash infected urine into their eyes or by eating hay or feed contaminated by infected urine.

Once infected, horses might experience fever, become listless, or go off their feed. Their eyes can become painful, causing swelling, squinting, blinking, cloudiness, and tearing. Pregnant mares will often lose their foals late in gestation. Adult horses might show signs of jaundice (yellowing of the mucous membranes or eyes) in the latter stages of the disease and can die of liver and/or kidney failure. If you see any of these signs in your horse, consult with your veterinarian.

Equine leptospirosis prevention involves good management to keep wildlife out of areas where horses live and eat. Horses should not be allowed to drink from stagnant water or ponds that might be contaminated with cattle urine. Owners should disinfect areas where known infected animals have been before introducing new animals.

Leptospirosis is a zoonotic disease—one that can be transmitted from



UKVDL confirmed equine leptospirosis abortion cases (by fluorescent antibody testing) from 2006 to the present.

animals to humans. Veterinarians and owners should use care when handling a suspect animal so as to not be exposed. They also should use protective gloves and glasses when working with aborted animals. Be sure to wash any exposed body parts thoroughly with antibacterial soap. Remove contaminated bedding and spray stall areas with a disinfectant. A video on stall disinfection by Roberta Dwyer, DVM, MS, Dipl. ACVPM, a professor in UK's Department of Veterinary Science is available at: www.TheHorse.com/Video.aspx?vID=488.

Many veterinarians are treating mares suspected to be infected prophylactically (i.e., prior to seeing clinical signs or abortion). The drugs of choice for infected horses are oxytetracycline, streptomycin, or penicillin. Vaccines are available for dogs and cattle, but not for horses. The cattle vaccine has been used in horses with poor results and often with side effects.

The UKVDL can assist veterinarians in diagnosing leptospirosis by testing blood and urine for evidence of the disease. In addition, owners/

(LEPTOSPIROSIS UPDATE ...)

veterinarians should submit aborted or weak foals that die to the laboratory for a complete necropsy and testing for the disease.

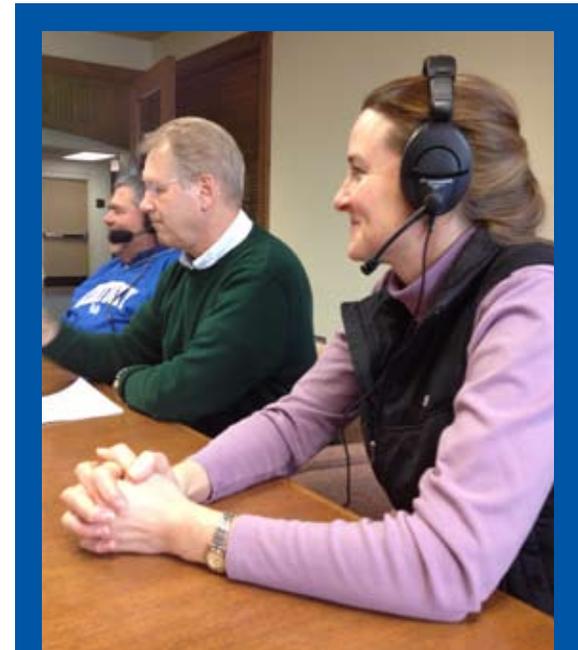
Furthermore, the UKVDL is conducting a national sero-epidemiological study of equine leptospirosis to better understand the distribution of horse exposure to leptospire and to lend strength to the idea of a vaccine for the horse. Study results will be published this year and presented at the Equine Diagnostic and Research Seminar at the UKVDL on Aug. 30.

Visit the UKVDL website for the latest statistics on leptospirosis, herpesvirus, and

nocardioform placentitis-related abortions at <http://vdl.uky.edu/documents/bulletins/Equine-HealthBulletin2012.pdf>.

For more information contact Craig Carter, DVM, PhD, Dipl. ACVPM, director of the UKVDL and professor of epidemiology, at 859/257-8283 or Craig.Carter@uky.edu; or Jacqueline Smith, epidemiology section chief at the UKVDL, Jacqueline.Smith2@uky.edu or 859/257-8283. **UK**

Craig Carter, DVM, PhD, Dipl. ACVPM, director of the UKVDL and professor of epidemiology, provided this information.



On Saturday, Feb. 11, the Horse Racing Radio Network hosted its Saturday Equine Forum with the University of Kentucky (UK) Ag Equine Programs at the UK Gluck Equine Research Center. Guests included Jill Stowe, PhD; Bob Coleman, PhD; Ray Smith, PhD; Mats Troedsson, DVM, PhD, Dipl. ACT, ECAR; and UK Horse Racing Club students Natalie Heitz and Audrey Boslego. Topics included the Kentucky Equine Survey, undergraduate program and internship opportunities, the Horse Pasture Evaluation Program and general forage information, the Gluck Center 25th anniversary, the reproductive facilities' grand opening, and the Horse Racing Club's spring event and handicapping tournament. Listen to the podcast at <http://horseracingradio.net/?p=2213>.

Like us on facebook.

The University of Kentucky College of Agriculture has several equine-related pages on Facebook with the latest news and events information. Stay up-to-date with the latest happenings by following our activity on the following pages:

[UK Ag Equine Programs](#): The UK Ag Equine Programs (formerly Equine Initiative) is an overarching framework for all things equine at the University of Kentucky, including the undergraduate degree program, equine-related student organizations, equine research, and outreach activities.

[University of Kentucky Maxwell H. Gluck Equine Research Center](#): The Gluck Center's mission is scientific discovery, education, and dissemination of knowledge for the benefit of the health and well-being of horses.

[Kentucky Equine Networking Association](#) (created by the Kentucky Horse Council and University of Kentucky): The Kentucky Equine Networking Association's (KENA) mission is to provide an educational and social venue for equine professionals and other horse enthusiasts from all disciplines to share ideas and business strategies and obtain current knowledge on horse and farm management with the principal objective of enhancing individual horse ownership and the horse industry at large.

[Saddle Up SAFELY](#): Saddle Up SAFELY is a rider safety awareness program sponsored by UK HealthCare, UK College of Agriculture, and many community organizations. It aims to make a great sport safer through education about safe riding and horse handling practices. **UK**

Equine Showcase and Third Annual Kentucky Breeders' Short Course

The University of Kentucky (UK) Ag Equine Programs hosted the Equine Showcase and 3rd Annual Kentucky Breeders' Short Course on Jan. 20 and 21, at the UK Veterinary Diagnostic Laboratory (UKVDL). More than 140 individuals representing 16 states were in attendance for lectures on young horse health issues and reproductive health. Presentations topics included:

Common Infectious Diseases of the Horse David Horohov, PhD, William Robert Mills chair and professor at the Gluck Center, opened the Equine Showcase saying, "It's not cheery to talk about all the diseases that can kill your horse, but that's why research is so important."

Horohov said a foal's immune system is completely naïve because the mare does not transfer antibodies to him *in utero*. Therefore, a newborn foal is particularly susceptible to infection. The mare's colostrum (first milk), however, contains necessary antibodies, and within eight hours of suckling, antibodies appear in the foal's blood, reaching normal levels by Day 2. Thus, it is critical to vaccinate the mare and ensure the foal receives colostrum at birth. The colostrum's protection diminishes around four to six months of age, making foal vaccination necessary to ensure complete protection.

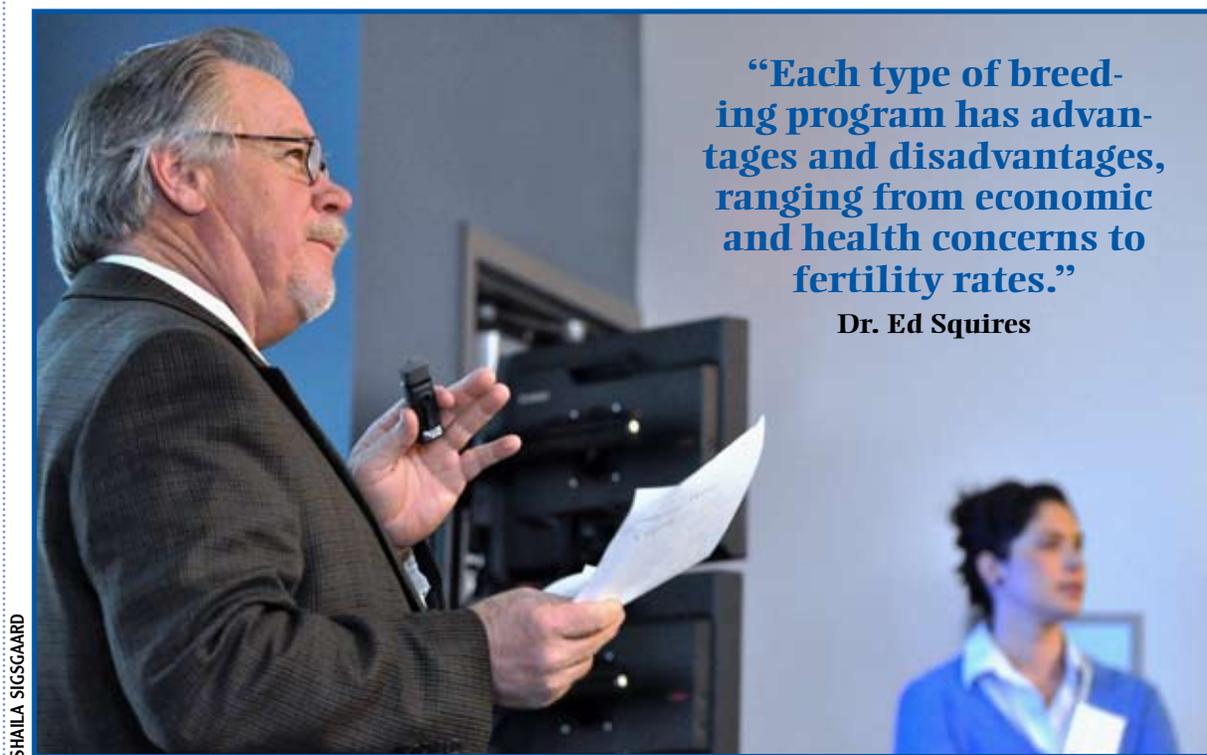
"The importance of keeping the mare vaccinated to prevent infection in the foal cannot be overstated," Horohov said.

Common infectious diseases in young horses are respiratory, septicemia, musculoskeletal, umbilical, and gastrointestinal. Preventing infectious disease depends on multiple factors including housing, weather, nutrition, and handling.

Cartilage Development and Maturation in Young Horses Orthopedic injuries impact a horse's ability to perform, and some can be career- or life-ending. Cartilage does not repair itself, so an in-

jury is a chronic, progressive disease, said Jamie MacLeod, VMD, PhD, John S. and Elizabeth A. Knight chair and professor of veterinary science at the Gluck Equine Research Center.

In adult horses, the veterinarian's goal is to maintain the structural integrity of the cartilage surface, but in the neonate, it's necessary to promote growth and expansion of the articular surface. The first five months of a foal's life, when cartilage is under the force of normal exercise, are critical for musculoskeletal development, according to MacLeod.



"Each type of breeding program has advantages and disadvantages, ranging from economic and health concerns to fertility rates."

Dr. Ed Squires

SHAILA SIGSGAARD

Dr. Ed Squires and Sydney Hughes during the Kentucky Breeders' Short Course

(EQUINE SHOWCASE ...)

“During exercise cartilage and fibers have a different orientation and heterogeneity,” he said. “You need to get the foal out and running around.”

Nutritional Needs of the Young Horse Laurie Lawrence, PhD, professor in the department of animal and food sciences at UK, covered nutrition and growth, and said in young horses moderate, steady growth is most desirable. Nutrition, whether from the mother’s milk, concentrate, or

forage, is a tool to manage growth.

“Research shows that slow growth followed by rapid growth, usually caused by an increase in feed, increases flexural deformities, such as incidences of upright pasterns, club foot, and being over at the knee,” Lawrence said. “An issue that can be overlooked is how the growing conditions of pastures can affect growth rates. The average daily gain of a foal on milk up to 90 days of age is 2.5 pounds. On pasture, the foal’s weight

gain can vary from 2 pounds, 2.5 pounds, or 3 pounds, indicating that pasture influences growth more than we realize.”

Building Muscle in Young Horses Forty to 55% of a horse’s body weight is muscle, which is a very high percentage compared to other animals, said Kristine Urschel, PhD, an assistant professor in Animal and Food Sciences at UK.

During the first six months to a year of a horse’s life, he experiences rapid weight gain fueled by feed and exercise, both of which increase muscle protein synthesis. The best diet after exercise is carbohydrate and protein in a single source to increase muscle growth. Muscle also is a storage point for amino acids the body uses during metabolic function.

“Larger muscle mass correlates to greater power output, or athletic ability. And because muscle enhances the aesthetics, or look, of a horse, it may be a factor in sale prices,” Urschel said.

Vaccination Strategies and Immunity in Young Horses “Vaccination is the primary way we control, prevent, and limit the spread of disease,” said Amanda Adams, PhD, assistant research professor at the Gluck Center. “Because the (young) animal’s immunity is naïve, we use vaccination to mimic natural infection without inducing infection.”

Veterinarians typically administer the first dose at 4 to 6 months, when vaccines



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(EQUINE SHOWCASE ...)

can overcome maternal antibody interference, the process in which the mare's antibodies suppress the vaccine, inhibiting its effectiveness.

"The young horse receives passive immunity from colostrum, and it is an art and science to know when to vaccinate as the maternal antibodies decline," Adams said.

Deworming Strategies for the Young Horse Because of parasite resistance to dewormers, horse owners are changing deworming strategies, according to Martin Nielsen, DVM, PhD, assistant professor at the Gluck Center.

"Owners must know their drugs and whether they work on their farm. Owners must also know their parasites, since different parasites require different drugs," Nielsen said.

Horses can be affected by *Strongyloides westeri* (threadworms), *Parascaris equorum* (ascarids), strongyle parasites (large and small), and *Anoplocephala perfoliata* (tapeworms).

As drug resistance increases, fecal egg counts before and after treatment become more important. If the fecal egg count is reduced, the dewormer worked.

"It's important to avoid parasitic disease, as it causes stunted growth, diarrhea, and colic," Nielsen said. "It's also important to reduce development of resistance and to promote the development of immunity."

Pricing Issues Related to Young Thoroughbreds Horses have been a focus of economic study for the past 20 years, according to Jill Stowe, PhD, assistant professor in agricultural economics at

UK, because—like real estate—horses are a heterogeneous product in which no two are exactly alike.

Horse transactions provide a window into how the market currently values unique goods, estimating market value for different sets of characteristics, such as dam, sire, and sibling quality.

"There is a small probability to do very well. But most buyers don't behave rationally, which makes the auction environment an interesting behavioral study," Stowe said.

Breeders' Short Course (Day 2)

Pregnancy Rates with Fresh, Cooled, and Frozen Semen Edward Squires, PhD, Dipl. ACT (hon.), director of the UK Ag Equine Programs and executive director of the UK Gluck Equine Research Foundation, lectured on management tools that hasten the breeding season in any breeding program, whether live cover or artificial breeding (using fresh, cooled, or frozen semen). He said each type of breeding program has advantages and disadvantages, ranging from economic and health concerns to fertility rates.

Management tools for estrus detection include teasing (behavioral signs, winking of vulva, raising the tail, etc.) and ultrasound. In a breeding program, a veterinarian will predict ovulation according to days in heat, follicle size, growth of the largest follicle, what happened in the previous cycle, and follicle softness.

Squires presented the window for maximum fertility with fresh, cooled, and frozen semen.



ANNE M. EBERHARDT

Dr. Ed Squires discussed pregnancy rates using fresh, cooled, and frozen semen.

He also recommended careful mare selection, excluding old or barren mares, and for owners to weigh the costs of semen against the cost of veterinary care when determining how many doses to order.

Fertilization Failures and Pregnancy Losses during Early Gestation/Pregnancy Losses during Late Pregnancy and Diagnosis of Placentitis Barry Ball, DVM, PhD, Dipl. ACT, Albert G. Clay Endowed Chair in Equine Reproduction at the Gluck Center, cited three studies (two from his team), in which estimated equine pregnancy losses were consistent with that of other mammals, including women.

"As mares age, they get pregnant less often and they lose pregnancies," Ball said.

He also discussed placentitis (inflammation of the placenta), the most common infectious cause

(EQUINE SHOWCASE ...)

of abortion in mares. The cause of placentitis can be bacterial or fungal; chronic placentitis can result in placental insufficiency, fetal wasting, and premature fetal maturation.

Diagnostic methods for detecting placentitis include clinical examination, ultrasound, endocrine methods, microbiology/cytology, and fetal fluid sampling.

Nocardioform placentitis describes a distinct form of placentitis, principally found in Kentucky, which results in late-term abortion.

“Climate has some role in placentitis,” said Ball. “In dry weather we see more nocardioform, though the effects of climate and/or season are not fully understood.”

Effect of Foaling Season and Reproductive Status

at Time of Breeding on Occurrences of Dystocia in Thoroughbred Mares in Central Kentucky Sydney Hughes, a graduate student at the Gluck Center, conducted a study of 1,982 Central Kentucky parturitions on four farms in which maiden mares exhibited dystocia (difficult birth) less frequently than foaling or barren mares. Time of parturition during the foaling season did not appear to affect dystocia incidences. Squires delivered the presentation.

Performance of Foals from Suspect High-Risk Pregnancies Hughes presented information from her study on the performance of foals out of suspect high-risk pregnancies, based on race records from 190 pairs of racehorses born between 2000 and 2008. She compared horses

out of mares suspect for high-risk pregnancies with horses out of mares exhibiting no signs of a high-risk pregnancy. Foals out of high-risk pregnancies performed similar to their matched control pairs.

Endometrial Biopsy as a Potential Indicator of Uterine Artery Rupture Risk Neil Williams, DVM, PhD, Dipl. ACVP, of UKVDL, discussed uterine artery rupture, which occurs in older mares around the time of parturition, causing coliclike clinical signs or sudden death. The rupture is a massive hemorrhage into the broad ligament and abdomen and is correlated to age, parity, and influenced by repeated foaling cycles.

Williams hypothesizes that degenerative changes within arteries in the endometrium correlate to changes in uterine arteries and can be used to predict increased risk for uterine artery rupture.

“There are pregnancy-related changes to the uterus and the arteries to the uterus, which have consequences to reproductive ability,” Williams said.

Effects of Tall Endophyte-Infected Fescue in Horses and Cattle Karen McDowell, PhD, associate professor at the Gluck Center, lectured on the deleterious effects of grazing horses—particularly late-gestation mares—on endophyte-infected (EI) tall fescue, which harbors a fungus that causes vasoconstriction (narrowing of the blood vessels). In the fescue belt, which includes Kentucky, a particularly hardy endophyte-infected fescue called Kentucky-31 is found growing on a high percentage of horse farms.



ANNE M. EBERHARDT

Dr. Karen McDowell examined tall endophyte-infected fescue's effects on horses and cattle.

(EQUINE SHOWCASE ...)

Fescue toxicosis, in both cattle and horses, can result in:

- prolonged gestation, decreased reproductive efficiency, decreased milk production during lactation;
- altered hormone concentrations in late gestation; and
- thickened placenta with “red bag,” dystocia, agalactia (absence of milk production).

McDowell said researchers are using ultrasound to study the palmar artery in the leg, which becomes constricted when horses are fed endophyte-infected fescue. This is used as a model to understand how EI tall fescue might inhibit blood flow to the uterus and placenta.

Weed Management in Horse Pastures after Renovation William Witt, PhD, a researcher in the department of plant and soil sciences at UK, continued to lecture on EI tall fescue and weed management in horse pastures. Removal is a daunting task, he explained, as tall fescue is a particularly hardy and competitive grass.

“If you want fewer weeds, grow tall fescue,” Witt said, emphasizing its hardiness. “Sooner or later, tall fescue starts coming back, two or more years in the future.”

Based on his research, he recommends farmers practice selective removal of endophyte-infected tall fescue when the pasture is less than 50% fescue. When it counts for more than 50%, he recommends starting over, killing everything in mid-July and reseeding Sept. 1, a process that is both lengthy and expensive.

Effect of Tall Fescue on Pregnant Mares and What to do with Pastures Containing It Tom Keene, hay marketing specialist at UK, said most endophyte-infected tall fescue research has been done on mares, not on yearlings, stallions, or other groups, so the effects are not fully understood. The UK Horse Pasture Evaluation Program provides guidelines for pasture and forage management, and it analyzes tall fescue’s fungal endophyte infection level and ergovaline concentration, both of which are important for farmers to understand when assessing potential danger to a broodmare.

“There is a lot of cross-contamination and a lot of infectious diseases we can pick up. And it’s important to remember that no vaccine is 100% effective.”

Dr. Roberta Dwyer

“Dilute the effects of tall fescue by planting other grasses and keeping it in a vegetative state,” he said.

Nutrition and Rebreding Efficiency Lawrence discussed the importance of body condition scoring (using the Henneke system) for efficient reproduction.

“Fatter mares have a higher rate of pregnancy. A mare who is below a 5 at the beginning of breeding season will have lower breeding efficiency,” Lawrence said. “It is harder to get thin

mares to conceive.”

Because most fetal weight gain occurs in the last 60 days of gestation, the mare’s nutrient requirements remain quite high, but the mare’s feed intake does not always increase because there is no room to put that extra feed.

“Mares will use their body stores and lose condition to support the growing foal,” Lawrence said. “Body condition is the most important nutritionally-related variable that affects reproductive efficiency.”

Practical Biosecurity for Horse Farms “Everyone has a different definition of biosecurity, but basically it means keeping ‘us’ safe,” said Roberta Dwyer, DVM, MS, Dipl. ACVPM, a professor in the department of veterinary science at UK. “There is a lot of cross-contamination and a lot of infectious diseases we can pick up. And it’s important to remember that no vaccine is 100% effective.”

She recommended owners work with their staff and veterinarian to establish a biosecurity plan that includes fly, rodent, bird, and pest control, reduction of standing water sites, and employee education.

Simple biosecurity starts with detergent, hot water, and a scrub brush. Soap is the enemy of many germs, but she pointed out that organic matter—blood, pus, feces—inactivates bleach.

For updates on global outbreaks, visit www.promedmail.com. [UK](#)

Karin Pekarchik is a former editorial officer in UK’s Agricultural Communications Services.

2012 UK EQUINE DIAGNOSTIC AND RESEARCH SEMINAR SERIES

The 2012 University of Kentucky's Department of Veterinary Science Equine Diagnostic and Research Seminar series kicked off Jan. 26 with a presentation by the UK Veterinary Diagnostic Laboratory's (UKVDL) Cynthia Gaskill, DVM, PhD, and Laura Kennedy, DVM, Dipl. ACVP, on "Case studies in equine toxicology."

On Feb. 23 Rob Foss, DVM, of Equine Medical Service in Columbia, Mo., lectured about approaches to assisted reproduction. All seminars take place at 4 p.m. on the dates listed, at the UKVDL located at 1490 Bull Lea Rd. in Lexington.

This seminar series is co-sponsored by the UK College of Agriculture, UK Gluck Equine Research Center, UKVDL, Pfizer Animal Health, Kentucky Association of Equine Practitioners (KAEP), and TheHorse.com.

For those who cannot attend in person, TheHorse.com videotapes and archives these lectures, which are free to registered users at www.TheHorse.com/videos/Horse-Courses.aspx through sponsor Pfizer Animal Health.

The schedule for the remainder of 2012:

March 29

Name: Jim Belknap, DVM, PhD, Dipl. ACVS, Ohio State University
Subject: Laminitis

April 26

Name: Kent Allen, DVM, Virginia Equine Imaging, Middleburg, Va.
Subject: Lameness and diagnostic imaging

May 31

Name: Martin Nielsen, DVM, PhD, Dipl. EVPC, UK Gluck Equine Research Center
Subject: Equine parasites

June 28

Name: Alicia Bertone, DVM, PhD, Dipl. ACVS, Ohio State University
Subject: Joint diseases

July 26

Name: Amanda Adams, PhD, and Macarena Sanz, DVM, MS, Dipl. ACVIM, UK Gluck Center
Subject: Stress of weaning

August 30

Name: Craig Carter, DVM, PhD, Dipl. ACVPM, UKVDL
Subject: Equine leptospirosis

September 27

Name: Robert Mealey, DVM, PhD, Dipl. ACVIM, Washington State University
Subject: Equine piroplasmiasis

October 18

Name: Reid Hanson, DVM, Dipl. ACVS, ACVECC, Auburn University
Subject: Sport horse musculoskeletal injuries

November 15

Name: David Horohov, PhD, UK Gluck Center, and Allen Page, DVM, PhD candidate at UK Gluck Center
Subject: Update on equine proliferative enteropathy

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

UPCOMING EVENTS

March 6, 4-7 p.m.

4th Annual Equine Career Fair, hosted by UK Ag Equine Programs and Georgetown Equine Scholars Program, E.S. Good Barn

March 10

Kentucky Spring Horse Judging Clinic, Fayette County Cooperative Extension Office

March 15

Kentucky Equine Networking Association (KENA) meeting, networking 6 p.m., dinner 6:30 p.m., Embassy Suites, Lexington.

March 29, 4 p.m.

Department of Veterinary Science Equine Diagnostic Research Seminar Series, Jim Belknap, DVM, PhD, Dipl. ACVS, from Ohio State University will speak about laminitis. Veterinary Diagnostic Laboratory

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