

UK Researcher Awarded \$2.9 Million for EVA Research

Udeni Balasuriya, BVSc, MS, PhD, a professor at the University of Kentucky (UK) Maxwell H. Gluck Equine Research Center, recently received a \$2.9 million, five-year grant from the USDA Agriculture and Food Research Initiative to identify the genetic factors responsible for establishment of the equine arteritis virus (EAV) carrier state in stallions.

According to Nancy Cox, MS, PhD, associate dean for research in UK's College of Agriculture and administrative leader for UK's Ag Equine Programs, Balasuriya's grant was ranked the highest in its category, unusual for a USDA grant program that normally targets food animals. This is one of the largest grants awarded in the College of Agriculture in the last year, she said, and is unique in that it includes funds for getting results out to the public in the fastest, most efficient way.

Equine viral arteritis (EVA) outbreaks result in significant economic losses to the equine industry due to foal loss in pregnant mares, death of young foals, and establishment of the carrier state in stallions. The virus remains in the equine population between breeding seasons by persisting in carrier stallions.

The project stems from research by graduate student Yun Young Go, who worked in Balasuriya's Gluck Center laboratory. Her initial focus involved characterizing the EAV target cell population(s) in equine white blood cells. These cells are important because they eliminate cells attacked by the virus.

According to Balasuriya, the study demonstrated that EAV could infect isolated cultured white blood cells in the lab.

"Subsequently, this study was expanded to include the latest information available from the equine genome," he said.

The genome studies were done in collaboration with Gluck Center researchers Ernie Bailey, PhD, and James MacLeod, VMD, PhD. Co-principal investigators of the study include eight Gluck Center faculty members—Sergey Artiushin, PhD; Bailey; Frank Cook, PhD; David Horohov, PhD; MacLeod; Edward Squires, MS, PhD; Peter Timoney, FRCVS, PhD; and Mats Troedsson, DVM, PhD, Dipl. ACT, ECAR. This collaboration includes expertise in the areas of immunogenetics, genomics, molecular virology and viral pathogenesis, equine reproduction, equine immunology, diagnostic pathology, molecular and cell biology, and equine infectious diseases.

The study will further investigate the possibility that susceptibility might vary in different horses. The team will study the nature of the susceptibility first in more isolated cells in the laboratory, then later with stallions.

"This cutting-edge research under the leadership of Dr. Balasuriya will use new approaches to identify genetic factors associated with the establishment of persistent EAV in stallions," said Troedsson, director of the Gluck Equine Research Center and chair of UK's Department of Veterinary Science. "The recent sequencing of the equine genome by an international consortium, including several scientists from the Gluck Equine Research Center, has made this kind of research possible.



Dr. Udeni Balasuriya

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Exploring genetic variations among horses to explain mechanisms on how they respond to viral infections is an exciting research area that is expected to not only improve our understanding of viral diseases in general, but also provide veterinarians and horse owners with new diagnostics and tools for individual management and treatments in the future."

This study will provide research opportunities for graduate and undergraduate students to address equine arteritis virus through integrating functional genomic studies and education. Findings from the studies will be disseminated through seminars and symposiums. **UK**

>Jenny Evans, an MFA candidate, is the Gluck Equine Research Foundation coordinator.

Exercise, Nutritional Supplement's Effects on Inflammation

Researchers are a step closer to helping owners and trainers identify whether a horse is at risk for soft tissue injury. A simple blood test could reveal inflammatory mediators indicating the animal has sustained tissue damage and could be vulnerable to further harm.

David Horohov, PhD, Jes E. and Clementine M. Schlaikjer Chair at the University of Kentucky's Gluck Equine Research Center, described the usefulness of detecting pro-inflammatory cytokine mRNA at the 2012 American Association of Equine Practitioners convention, held Dec. 1-5 in Anaheim, Calif.

"The expression of pro-inflammatory cytokine mRNA post-exercise is an indicator of the body's response to tissue damage that has occurred during the exercise," Horohov explained. "While we normally associate inflammation with a disease state, the fact is that some inflammation is necessary to begin the healing process.

"However, if pro-inflammatory cytokine mRNA expression continues to rise throughout the training period, the amount of damage that is occurring may be exceeding the capacity of the body to heal, and this could result in an injury," he continued. "By contrast, if the pro-inflammatory gene expression goes down over time the horse is adapting to

used as comparisons later in the study period. Two weeks prior to training commencement, he started 13 of the 25 horses on a nutritional supplement containing antioxidants and anti-inflammatory components. He hoped to determine if administering the product impacted pro-inflammatory cytokine expression.

Throughout training, Horohov and colleagues collected blood samples one hour before exercise; within five minutes of exercise completion; and two hours post-exercise.

"If the pro-inflammatory gene expression goes down over time, the horse is adapting to the exercise."

Dr. David Horohov

the exercise, and this likely means the horse is at less risk for injury."

Horohov and his colleagues employed 25 2-year-old Thoroughbreds arriving at a training center two months before beginning training; shortly after their arrival, he took baseline blood samples to be

He isolated total RNA from the samples and evaluated pro-inflammatory cytokine gene expression.

The team found that pro-inflammatory cytokine expression increased two hours after the horses exercised, and that throughout the training period pro-inflammatory

cytokine expression decreased statistically significantly for horses consuming the nutritional supplement.

"Signs of adaptation to exercise over the training period were indicated by an overall reduction in the expression or pro-inflammatory cytokines," Horohov relayed. He noted also that the nutritional supplement was associated with "enhanced adaptation" to exercise.

"It is possible that we could use this method to assess a horse's adaptation to training and to monitor it for signs of impending problems," he said. "Since the nutritional supplement was able to enhance this adaptation process, it suggests that some horses could benefit from its use."

Horohov said that he is conducting a larger project that will include 100 young racehorses in training.

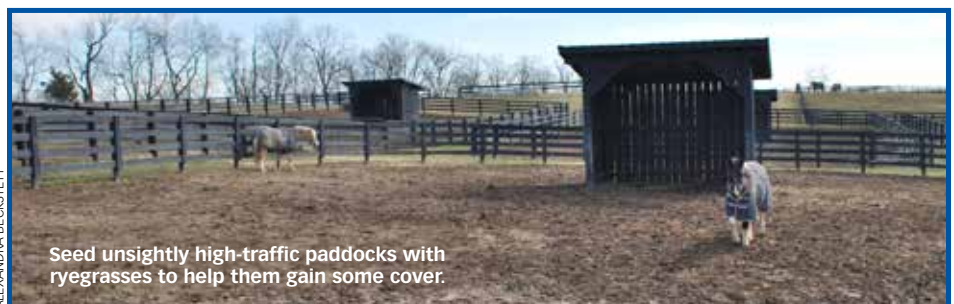
"Here we will expand the number of genes we are monitoring to see if changes in a specific gene's expression can be associated with an increased risk for injury," he said. **UK**

>Erica Larson is the news editor for TheHorse.com.

Renovating the High-Traffic Paddock

Kentucky is known for its beautiful rolling green pastures filled with broodmares and their young, but there can be an ugly side to this picture: the half acre turnout paddock next to every barn. You know the one—new mares and foals, mares close to foaling, or horses on layup are turned out there every day.

Almost every farm has at least one of these paddocks, sometimes many. High-traffic paddocks are essential to the constant care of some horses. However,



ALEXANDRA BECKSTIETT

they become eye sores and provide little, if any, grazing for the horses. Luckily, there are a few ways to help these paddocks gain some type of cover.

Ryegrasses, both perennial and annual, are vigorous grasses that establish quickly and have the best chance of establishment in high-traffic paddocks. Annual ryegrass will not survive

the summer in Kentucky and must be seeded once or twice a year to provide some cover. Perennial ryegrass will typically survive two years in Kentucky and surrounding states and might not need to be seeded as often, depending on grazing pressure. Perennial ryegrass can be infected with an endophyte similar to that in tall fescue, so be sure to purchase

High-Traffic Paddocks

endophyte-free seed. Perennial ryegrass is frequently added to a cool-season pasture mix; however, because it is so vigorous, it should not comprise more than 20% of the mixture. Unless sufficient rest can be given to high-traffic paddocks, seeding a mixture is unlikely to be more productive over seeding pure ryegrass.

Ideal seeding dates for Central Kentucky are Sept. 1-15 or March 1-15. For the best chance of success, use a no-till drill or a light tillage, seeding, then dragging or rolling to get the seed into the ground. Place cool-season grass seed ¼ inch deep into firm soil. For small areas such as around gates and feeders, mulch with straw or irrigate the area to further help new seedlings establish. Any rest that can be given to the newly seeded pasture will help, and the more the better. For ryegrasses rest the paddock for six to eight weeks, and for cool-season pasture mixtures rest for four to six months.

“Remember to soil test and apply appropriate fertilizer with all pastures,” said Ray Smith, PhD, a forage specialist at the University of Kentucky. “Normally, we recommend applying nitrogen only in the fall to cool-season grass pastures, but with heavily grazed pastures, applying nitrogen at low levels (30 to 50 lbs/acre) in March, May, September, and late October will help stimulate grass regrowth.”

Some high-traffic paddocks have no hope of gaining cover even when seeded regularly with ryegrasses. This might be due to extremely high traffic, poor soil quality, or steep slope of the land. For these areas, a high-traffic area pad or drylot might be the best option to provide safe footing for horses and people as well as to reduce erosion.

For more information, see “Establishing Horse Pastures (ID-147),” “High Traffic Area Pads for Horses (ID-164),” and “Using Drylots to Conserve Pastures and Reduce Pollution Potential” at www.uky.edu/Ag/Forage/HorseLinks.htm.

Also, like UK’s Pasture Evaluation Program at www.facebook.com/UKHorsePastureEvaluation?ref=hl. **UK**

>Krista Cotten, an MS candidate and assistant coordinator of the University of Kentucky’s Horse Pasture Evaluation Program, provided this information.

MASTHEAD

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UK Gluck Center Faculty Receives \$100,000 for EHV-1 Study

Udeni Balasuriya, BVSc, MS, PhD, a professor at the University of Kentucky Maxwell H. Gluck Equine Research Center, received a \$100,000 gift from Wellington Equestrian Partners and Tequestrian Farms to further research equine herpesvirus (EHV-1).

EHV-1 is a significant threat to the equine industry as it causes respiratory disease, abortion, and neurologic diseases. Although respiratory disease causes problems for the performance horse industry due to disrupted training or racing, EHV-1’s ability to induce abortion and neurologic disease is of most concern.

The research will focus on determining the virus’ virulence during an outbreak, providing an understanding of the molecular basis of the neurologic disease, improving diagnostic techniques, and providing a basis for developing more effective vaccines.

“We are interested in helping to fund new EHV-1 research after our experience with a false-positive case,” Tequestrian Farms Owner Tom Tisbo said in a release. “The ongoing problems the equine community in the United States has faced with EHV-1 and its impact on the horse are a sign that more work needs to be done to understand this devastating disease.”

The increase variant EHV-1 strain incidence in recent years has given rise to considerable concern from horse industries and governmental agencies responsible for equine health worldwide. It has a major impact on horse movement and horse show conduct and can cripple an event, causing millions of dollars in losses.

“The Tisbos approached me with the idea of helping the equestrian industry become

more informed about EHV-1," said Mark Bellissimo, Equestrian Sports Productions chief executive officer, Wellington Equestrian Partners managing partner, and Gluck Equine Research Foundation board member. "We think a gift to the Gluck Center is a great first step and hope that with a veterinary committee's assistance, we can start the conversation of getting universal protocols for the prevention and treatment of this disease. We want to make sure that all of the horses coming to our horse shows are healthy, but also help determine the best way to apply standard measures at events. We want to learn from our recent experience and not look back, but forward, in order to get the best from a bad situation."

Gluck faculty members Frank Cook, PhD, and Edward Squires, PhD, Dipl. ACT (hon.), executive director of the Gluck Equine Research Foundation, will serve as co-principle investigators on the study. **UK**

>Jenny Evans, an MFA candidate, is the Gluck Equine Research Foundation coordinator at the Gluck Center.

STUDENT SPOTLIGHT

STEFFANIE BURK

From: Harmony, Penn.

Degrees and institute where received:

- **MEd, Slippery Rock University, Slippery Rock, Pa.**
- **BA, Biology, Slippery Rock University, Slippery Rock, Pa.**
- **PhD candidate, Animal Science, University of Kentucky**



Steffanie Burk decided to pursue her doctorate degree in the University of Kentucky's (UK) Department of Animal Science because of UK's reputation for equine research.

"After talking with Dr. Mary Rossano (MS, PhD) about her parasitology research, I felt that the University of Kentucky would be the best match for me," Burk said.

Burk's main research focus is the development of a western blot test for *Parascaris equorum*, a parasitic roundworm that commonly affects young horses. *P. equorum* is found worldwide and is commonly referred to as the ascarid. The parasite usually infects horses younger than 18 months while older horses are commonly immune to infection. Severe infections can lead to respiratory signs, anorexia, weight loss, depression, colic, or even intestinal rupture.

The only diagnostic method currently available is the fecal egg count, which diagnoses infection by detecting eggs mature female worms produce in the small intestine. Thus, the fecal egg count cannot diagnose migrating larval stages, and diagnosis occurs approximately three months after the initial infection. New diagnostic tools could, however, help to detect infection earlier while clinical signs due to migrating larvae are still occurring, Burk said.

"For my project, we first hatched and incubated *P. equorum* larvae in the lab," she said. "We collected excretory-secretory products from the larvae and used those proteins for western blotting."

During the western blotting process, Burk and her team tested different horse blood sera for antibody binding to the larval proteins. They collected the sera used for the tests from a group of pregnant broodmares at UK's Maine Chance Equine Campus and subsequently from their foals. This allowed Burk to study a group of foals' immune response over time as they developed natural *P. equorum* infections.

Although early results indicate that the western blot test will not be a useful diagnostic tool, alternative approaches could have diagnostic potential. Burk said the project will provide new information on horses' immune response to *P. equorum*.

Burk hopes to pursue a faculty teaching position with opportunities for undergraduate research once her project is complete. **UK**

>Shaila Sigsgaard is an editorial assistant for the Bluegrass Equine Digest.

Gluck Equine Research Foundation Releases Fourth Research Report

The University of Kentucky Gluck Equine Research Foundation published its 2012 Research Report in late March of this year. The report focuses on the University of Kentucky Maxwell H. Gluck Equine Research Center faculty's research accomplishments and scientific publications during the 2012 calendar year.

The Research Report is divided into the 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 2012 research technicians/assistants and visiting scientists.

The Research Report also covers Gluck Equine Research Center awards and grants, scientific publications including books/chapters in books, refereed journal articles, non-refereed journal articles, and seminars and papers presented. Further, the report 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 Evans at jenny.blandford@uky.edu or 859/218-1089. **UK**

>Jenny Evans, an MFA candidate, is the Gluck Equine Research Foundation coordinator at the Gluck Center.



Pervious Concrete Reduces Injury, Environmental Risks

Any owner who has ever bathed a horse while standing on a conventional concrete surface knows the soapy runoff can quickly create a slick hazard for both animal and human. Stephen Higgins, PhD, director of Environmental Compliance for the Agricultural Experiment Station at the University of Kentucky's College of Agriculture, says horse owners and barn operators can install pervious concrete material in bathing and other water-retaining areas to reduce injury risk and protect water resources.

Pervious concrete is a type of concrete material that allows rain water and runoff from activities such as bathing to pass through without significant pooling. Also known as porous concrete, porous pavement, or permeable concrete, the material is created by coating large aggregate with concrete paste. The resulting material allows water to run through a concrete slab. Due to its ability to filter water and to protect water quality, pervious concrete is used to pave streets and sidewalks and in sustainable construction projects. Around the farm, the material can be used in areas prone to water retention, Higgins said.

"Pervious concrete is best used in areas where you want to slow erosion or the speed of water—like under barn gutter downspouts—and it can also be useful in areas where traction is needed in the presence of water and/or soap," Higgins said. "It is also used to filter agricultural runoff because it provides a solid/liquid separation system."

The material's filtering ability provides several environmental benefits, Higgins said.

"Because of its filtering ability, pervious concrete doesn't allow a meandering stream of soap suds, urine, and other wastes to flow offsite," he said. "The material also provides filtering and storage of waste water and allows it to drain slowly, infiltrating the soil and being

used by plants."

In addition, beneficial microbes living within the pervious concrete matrix can help destroy harmful pathogens, Higgins said.

Pervious concrete is installed in a way similar to conventional concrete, but a roller compacts it to give it additional strength, Higgins said. A pervious concrete pad is typically placed at a depth of 6.5 inches, then consolidated to a final height of 6 inches. Biodegradable bean or vegetable oil is applied to the material's surface to allow the pervious concrete to remain moist and to cure properly. Following placement, a plastic cover is placed on the pad to retain moisture during the one- to two-week hydration process.

"The concrete will continue to cure for approximately 28 days," Higgins said.

Higgins said that pervious concrete is available from local concrete companies. They can make the material for small projects such as splash blocks themselves. Depending upon experience and skill level, owners can install the pervious concrete material personally. Contractors can install it as well.

"If I was doing a large job, I would consider using a contractor," Higgins advised.

Higgins said pervious concrete's installation cost is similar to that of conventional concrete, though installation by a certified pervious concrete contractor will be more expensive.

Finally, owners might realize long-term savings by using the material.

Not only does this material reduce injury risk because it has a high friction coefficient than most surfaces used for washing horses, Higgins said, but you're also not writing checks to a water quality regulator for polluting the waters. **UK**

Not only does this material reduce injury risk because it has a high friction coefficient than most surfaces used for washing horses, Higgins said, but you're also not writing checks to a water quality regulator for polluting the waters. **UK**

>Pat Raia is a professional journalist who has covered horse industry and equestrian topics for a number of publications.



PHOTOS.COM

UK College of Law to Host Equine Law Conference

The University of Kentucky College of Law will host its 28th Annual National Conference on Equine Law May 1 and 2 at Keeneland Race Course, in Lexington, Ky.

The conference will convey an understanding of current legal issues affecting breeding, buying, selling, ownership interests, racing, and other business operations of the horse industry. The program is designed for attorneys who counsel, represent, or litigate on behalf of buyers, sellers, breeders, brokers, owners of interests in horses, and other entities

The sessions will cover topics such as ethics, law of service animals, equine law tax updates, and equine after-care legal issues.

involved with the industry. The conference is open to the public.

The sessions will cover topics such as case law updates, law of service animals, expert witnesses in equine litigation, ethics for the equine lawyer, transportation issues in the

equine industry, equine law tax updates, status of the law on race-day medication, equine veterinary malpractice and third-party liability issues, and the legal issues surrounding equine after-care.

Registration with materials on a jump drive is \$500

in advance and \$575 at the door; registration with a hard copy of materials is \$575 in advance and \$650 at the door. The registration fee includes attendance for all sessions, course materials in format selected, Wednesday and Thursday luncheons, Wednesday reception, continental breakfasts, and refreshments. For more information, visit www.UKCLE.com or call 859/257-2921. **UK**

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

Kentucky Pasture Weeds

What grows in your horse's pasture? Ideally, abundant and nutritious forage. However, most Kentucky horse pastures contain about 20 plant species, many of which are weeds. The abundance of weedy species depends greatly on pasture management: Overgrazing of pasture grasses and soil compaction are primary causes of weed occurrence.

If pasture comprises a significant portion of a horse's diet, then you ideally want to grow a high-quality, nearly weed-free forage. Conversely, a pasture maintained as a drylot will contain many weeds but does not require weed control because there are few, if any, desirable forages present. In my experience, Kentucky horse pastures are maintained between these two extremes. Farm managers' primary concerns are plant identification in pastures and weed control.

Kentucky is located in the transition zone between warm-season and cool-season weeds, meaning weeds grow well in summer and winter. This provides horse pasture managers with the challenge of deciding what pasture weeds, if any, they should control. Generally, poisonous weeds and weeds that inhibit grazing should be removed from a pasture. Poison hemlock, for instance,

grows widely across Kentucky and is toxic to horses and other animals. Although rarely eaten by horses, it should be removed from the pasture. Musk thistle and bull thistle are also found throughout Kentucky and inhibit grazing. Canada thistle occurs less frequently but inhibits grazing and is difficult to control. Large crabgrass and yellow foxtail are warm-season summer grasses. Horses graze

Control poisonous plants such as poison hemlock by hand weeding, mowing at the proper time, or by applying herbicides in late fall or early spring. Regardless of the method, do not allow animals to graze dying or decaying hemlock plants. Hand weeding and removal of the plants from the pasture is the safest method. Weeds such as thistles generally are too numerous to hand weed, and require herbicide application.

For most weeds, mowing is not an effective control technique. Mowing might prevent some seed production; however, to kill many weeds, the mower must cut at about two inches or lower, which can reduce grass production.

Consult your county extension agent for weed identification and proper herbicide use to achieve weed control. You might also review "Response of Pasture Weeds to Herbicides or Mowing" (Green and Witt, 2012), which is available from the local Kentucky County Extension Agent for Agriculture and Natural Resources. This publication contains photographs of commonly occurring pasture weeds and specific control tactics. **UK**

>William Witt, PhD, a retired researcher in the Department of Plant and Soil Sciences University of Kentucky, provided this information. This was first printed in the Lloyd's Equine Disease Quarterly, January 2013, Volume 22, Number 1.

Table 1. Common Kentucky Weeds

Cool-Season Weeds	Warm-Season Weeds
Musk thistle	Large crabgrass
Bull thistle	Yellow foxtail
Canada thistle	Goosegrass
Buckhorn	Johnsongrass
Broadleaf dock	Spiny amaranth
Purple deadnettle	Buttercups
Chickweed	Common ragweed
Wild garlic	Asters
Star of Bethlehem	Perilla mint
	Cocklebur
	Hemp dogbane

the large crabgrass but not yellow foxtail. Buckhorn plantain is a cool-season plant that horses consume when pasture grass is limited. Other common weeds are listed in the above table.

No one weed control solution exists for all these species. First, determine if there is a need for removing the weeds.

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33rd Annual Alfalfa Conference Recap

More than 100 Kentucky alfalfa and grass hay producers attended the 33rd annual Alfalfa Conference held Feb. 21 at the Fayette County Extension Office. This year's conference focused on hay production for the horse and other high-quality markets. Several University of Kentucky researchers presented and also served on the conference's organizing board.

Two speakers on this year's schedule—Clayton Geraldts and Todd Clark—focused primarily on producing horse-quality alfalfa and alfalfa/grass hay. Geraldts, of Hart County, has produced horse-quality alfalfa for years. He operates a 600-acre farm with alfalfa, alfalfa/orchardgrass, and timothy as his main hay crops. He spoke about using RoundUp Ready alfalfa varieties, which allow him to spray the stands with RoundUp to remove all weeds and produce weed-free hay. RoundUp Ready Alfalfa was first available on the market in 2006.

On his 1,000+ acre operation, Lexington native Clark produces pasture-raised chicken, turkey, sheep, beef, and equine hay bales that typically weigh less than



COURTESY UNIVERSITY OF KENTUCKY

Dr. Garry Lacefield welcomes producers to the 33rd Alfalfa Conference.

50 pounds, per many horse owners' request. Traditional hay producers try to have the densest hay bales possible to make transportation more economical. However, Clark has found many of his clients are young females who prefer to not lift 60- to 80-pound bales. He also stresses that weed-free, dust-free, and very green hay is in high demand in the horse market. Hay not up to this

standard can be fed to other livestock, including cattle.

Other topics at the conference included grazing alfalfa with cattle, harvesting for baleage, and understanding the value of fertilizer in alfalfa hay production. During the lunch program winners were announced for the best alfalfa hay produced in 2012. Winners included Hunts Forage Farm, Chris Creech, Geraldts Farm, Woodland Place, John Nowak, Mike Malone, Jerry Samples, and Rick Horn. John McCoy won the champion Alfalfa Hay for 2012 award. The conference concluded with the panel of presenters taking questions from the crowd and each other.

The Kentucky Forage and Grassland Council hosts the Alfalfa Conference annually and rotates locations between Lexington and Cave City, Ky. For more information on next year's conference, contact your local county agent. Previous alfalfa conferences proceedings are available at www.uky.edu/ag/forage/proceedingspage.htm. UK

>Krista Cotten, an MS candidate and assistant coordinator of the University of Kentucky's Horse Pasture Evaluation Program, provided this information.



Dr. Garry Lacefield presents the Champion Alfalfa for 2012 to Mr. John McCoy.



The 100+ crowd at the Alfalfa Conference included producers and growers, county agents, NRCS agents, and more.



Members of the discussion panel (left to right): Dr. Ray Smith, Dr. Dennis Hancock, Todd Clark, Clayton Geraldts, and Todd Powell



Jake Schmitz of Organic Valley picks up a few UK publications from the Kentucky Forage and Grassland Council booth.

Equine Career Fair

More than 200 college students attended the 5th annual Equine Career Fair presented by the University of Kentucky Ag Equine Programs on March 5. Exhibitors representing more than 25 area organizations participated and provided career information and networking opportunities for students. The Career Fair also held interest sessions with industry leaders in the areas of graduate school, the Thoroughbred industry, pharmaceutical sales, and equine alternative therapy. Participants hailed from 39 states, two countries, and 34 colleges in the United States.



UPCOMING EVENTS

March 29-30

American Quarter Horse Association Roping and Cattle Event, Scottsville, Ky.

March 30

Bomb-Proofing the Mounted Patrol Way, with Holly Williamson at Willow Oak Hills in Maysville, Ky.

April 13, 9:30 a.m. -12:00 p.m.

Drawing workshop

April 7, 2 p.m.

Sanctuary-Portraits of Rescued Farm Animals. Artist and UK faculty member Sharon Lee Hart will discuss the images and inspiration for her book, of the same title as her talk. She will be signing books at the end of her talk. Art Museum at the University of Kentucky, free, donation suggested.

April 13, 9:30 a.m. -12:00 p.m.

Drawing workshop with renowned sporting artist Andre Pater. Andre will discuss and illustrate his techniques, and participants will have an opportunity to sketch and have him critique their work. Registration is \$40 for non-members and \$35 for museum members. Space is limited, so to reserve a spot, call 859/257-6199 or mail your check to the Art Museum at the University of Kentucky, Rose Street and Euclid Avenue, Lexington KY 40506-0241, attn: Education.

April 20, 9:30-11:30 a.m.

Learn to take pet photos with personality with Alyson Salyer. She will demonstrate techniques that help capture the expression and personality of your pet. Registration is \$20 for non-members and \$15 for museum members. Space is limited, so to reserve a spot call 859/257-6199 or mail your check to the Art Museum at the University of Kentucky, Rose Street and Euclid Avenue, Lexington 40506-0241, att: Education.

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