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University of Kentucky Part of Neogen's Animal Safety Success

In late June international animal and food safety giant Neogen Corporation announced an expansion of the company's Lexington, Ky.-based division. Neogen's Kentucky roots date back 20 years to when the company became interested in technology developed by the University of Kentucky (UK) and one of the school's first successful spinoff companies, WTT. Neogen would later set up an animal safety division in Lexington, buy WTT, and license the technology that has returned $2.2 million in royalties to UK.

David Watt, PhD, professor of cellular and molecular biochemistry in the College of Medicine; Hsin-Hsiung "Daniel" Tai, PhD, professor in the College of Pharmacy's Department of Pharmaceutical Sciences; and Thomas Tobin, PhD, MRCVS, Dipl. ABT, professor of veterinary science and in the graduate center for toxicology at the College of Agriculture's Gluck Equine Research Center, established WTT in 1988. The Kentucky Equine Drug Research Council and the Kentucky State Racing Commission had approached Tobin three years earlier to try to solve the opiate abuse problem plaguing the racing industry. He proposed developing a panel of highly sensitive immunoassay tests for these high potency drugs, which were difficult to detect at that time.

Tobin enlisted the help of Tai, who had developed numerous ELISA (enzyme-linked) immunoassay tests for prostaglandins, steroids, and other drugs. "I was confident that similar strategies could be applied to the development of ELISA tests for abused drugs in racehorses," Tai said.

Watt joined the group to create the chemical derivatives of each test's drugs—the first step in the process. By 1988, Watt, Tobin, and Tai had in place half a dozen carefully targeted opiate tests. According to Tobin, "Patterns of performance-enhancing substance abuse that had existed in racing for 100 years were abruptly terminated, and to use a racing phrase, the (ELISA) technology was off and running."

The next year they contacted Len Heller, former Vice Chancellor of Academic Affairs at the UK Chandler Medical Center, for financial assistance. Heller purchased the company, became CEO, and named co-owner Terri Morrical the CFO. The company licensed the technology through UK's for-profit corporation, Kentucky Technology Inc., and developed 29 ELISA diagnostic tests.

UK's technology became the foundation for Neogen's new animal safety focus and

ARTICLES OF INTEREST

(ANIMAL SAFETY SUCCESS ...)

Lexington-based division when Heller sold WTT to the company in 1991. Today, Neogen's Lexington operation manufactures and distributes a variety of animal healthcare products, including diagnostics, pharmaceuticals, veterinary instruments, wound care products, and disinfectants. The company employs close to 130 people at its two locations on Nandino Boulevard and Creative Drive.

"I had no idea that we were writing a bit of UK history with WTT," said Heller, who held a seat on the Neogen Board of Directors until he was named vice president of the new UK Office for Commercialization & Economic Development in late 2006. "WTT is a great success story for the university on several levels, and the researchers and their colleges are still receiving royalties today."

Heller is quick to point out that Neogen's Animal Safety Division is also a great success story for Lexington and the Commonwealth. Local and state government support over the years encouraged the international company to stay in Lexington and to reinvest in their Kentucky operation.

On June 28 Gov. Steve Beshear joined community leaders and Neogen Corporation officials to announce that the company will expand its Fayette County footprint with the addition of a 100,000-square-foot facility on Mercer Road. The project will generate a capital investment of more than $5.6 million and create 75 new jobs over the next several years.

"We're thrilled to be able to stay and grow within Lexington," said Morrical, who managed the transition at the time of the WTT sale and is Neogen's vice president of animal safety. "For quite some time, we had been clearly outgrowing our facilities, and we investigated many alternatives, both near and far, to best suit our expanding needs. Working closely with state and local officials, we realized that staying here was our best choice. The Mercer Road facility represents an excellent solution for our growth plans."

"Neogen and Lexington are a good fit," said Lexington Mayor Jim Gray. "Our economy needs the high-quality jobs the company provides, and Lexington, with its highly educated workforce and outstanding quality of life, is a place Neogen can thrive. We are excited about their growth." UK

Deb Weis is the marketing and communications director at the University of Kentucky Commercialization and Economic Development.

Leading Sire Stud Fees: Breeding to Sell

The University of Kentucky (UK) College of Agriculture's Agricultural Economics program continues to develop state-of-the-art financial tools to aid decision making in the equine industry. In a recent study forthcoming in *Applied Economics*, C. Jill Stowe, PhD, an assistant professor in agricultural economics at UK, analyzed the factors that determine leading sire stud fees in the Thoroughbred industry to inform owners and breeders about the breeding decisions made on a daily basis and their impact on the industry.

Data were collected from the "Blood-Horse Leading Sires List" for more than 100 sires that appeared on the list at least twice between 1999 and 2008 and were available to breed during the next calendar year. Stowe found that among these sires, the most significant stud fee predictor is the mean yearling sales price from

Compared to leading sire A, if leading sire B ...	B's first-year stud fee exceeds A's by ...
... produces yearlings that sell for an average of $10,000 more	$1,610
... has one more progeny standing at stud	$994
... produces progeny that earn $100,000 more on the racetrack in the previous year	$300
... produces one more Grade 1 stakes winner in the previous year	$3,122
... produces 1% more stakes winners	$2,242
... has an AEI that is 0.01 higher	$158

(STUD FEES ...)

the previous year. The next most significant variable is a sire's ability to produce colts who themselves will be successful sires. Other predictors of leading sires' stud fees include total progeny earnings from the previous year, the number of Grade 1 stakes winners produced in the previous year, the percentage of stakes winners a sire has produced in his career, and a sire's average earnings index (AEI). The inclusion of racetrack performance variables, however, only marginally improves the model's ability to explain stud fees; statistically, stud fees are largely determined by progeny sales prices and the "sire of sires" measure.

After identifying these attributes, Stowe estimated each characteristic's market value. The table on page 2 provides a general overview of the main results. Stowe also estimated that, on average, 2009 stud fees fell by more than $6,800 after the 2008 recession.

Thoroughbred breeders make breeding decisions that involve high stakes and high risk, and rigorous statistical analysis can serve as another tool in the decision-making process. Stallion owners/managers can use these study results as a benchmark in setting and evaluating stud fees. Mare owners can use these results to become informed about the market value of a sire's genetic traits and to identify sires that are undervalued based on the attributes determined to be significant in this paper.

The complete version of this article is forthcoming in *Applied Economics*. For a copy of the entire study, contact Jill Stowe at jill.stowe@uky.edu. UK

C. Jill Stowe, PhD, an assistant professor in Agricultural Economics at the University of Kentucky, provided this information.

WEED OF THE MONTH

Common name: Spiny pigweed, Spiny amaranth
Scientific name: *Amaranthus spinosus* L.
Life cycle: Warm season annual
Origin: Tropical Americas
Poisonous: No

Spiny Pigweed

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

Spiny pigweed control is relatively easy when herbicides are applied to plants less than 12 inches tall. Mowing and hand weeding are effective if done before flower production to prevent seeding. Consult your local Cooperative Extension Service personnel (http://ces.ca.uky.edu/ces) for herbicidal control in your area. UK

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

Gluck Center Researchers Synthesize ITPP for University of Pennsylvania

The performance-enhancing drug ITPP (myo-Inositol TrisPyroPhosphate) is thought to be widely abused in horse racing. It produces its performance-enhancing effects by binding to hemoglobin and accelerating oxygen release.

Responding to requests from researchers at the University of Pennsylvania, the University of Kentucky (UK) Gluck Equine Research Center's Equine Pharmacology, Therapeutics, and Toxicology program has synthesized a certified reference standard for ITPP. Chemists require certified reference standards to confidently certify an illegal medication's presence in a horse.

(ITPP ...)

To enable regulatory control of this performance-enhancing drug, Thomas Tobin, PhD, MRCVS, Dipl. ABT, professor of veterinary science at the Gluck Center, and his group developed a method to synthesize ITPP while working closely with Frontier BioPharm Inc. of Richmond, Ky. The ITPP reference standard was then made available to the University of Pennsylvania through a technology transfer licensing agreement between the UK Intellectual Property Office and Frontier BioPharm Inc., whose license covers commercialization rights to a series of certified reference standards and deuterated internal standards synthesized by the UK research program.

BENOIT & ASSOCIATES

ITPP is thought to be widely abused in horse racing.

"Several weeks ago we provided our Pennsylvania colleagues with reference standard amounts of ITPP for analytical method development and are now providing more substantial quantities of ITPP for experimental work, including equine administrations," Tobin said. "In the absence of access to reference standard quality ITPP it would not be possible to either 'call' an ITPP positive horse or to identify its true abuse potential in racing horses."

Racing scientists, including Lawrence Soma, VMD, of the University of Pennsylvania, and Cornelius Uboh, PhD, adjunct associate professor of pharmacy and pharmacology and director of the University of Pennsylvania Equine Toxicology and Research Laboratory in West Chester, are seeking to develop tests to control ITPP's use/abuse, but their efforts had been previously hampered by lack of access to reference standards for ITPP. UK

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

Nocardioform Placentitis Study Update

During the early part of the 2011 foaling season the University of Kentucky Veterinary Diagnostic Laboratory (UKVDL) reported an increased number of abortions and abnormal placentas due to nocardioform placentitis. The UKVDL epidemiology laboratory constantly surveys the occurrence of animal diseases and notes and monitors trends immediately.

Nocardioform placentitis is a unique form of bacterial placentitis (inflammation of the placenta) affecting late gestation mares, causing abortion, stillbirth, or foals born alive but compromised. The disease was first diagnosed in Central Kentucky in the 1980s and has also been reported in other areas of the United States and abroad. Nocardioform placentitis cases are diagnosed annually, with some years experiencing few cases and other years noting higher numbers. The 2011 foaling season was associated with an unusually large number of cases, and before the foaling season was over 684 abortions and 274 nocardioform placentitis cases had been submitted to UKVDL.

In February 2011 the University of Kentucky Gluck Equine Research Center and UKVDL coordinated a meeting with a small group of local veterinarians to discuss the status of nocardioform placentitis abortions in Central Kentucky and devise potential studies. The Gluck Center hosted an informative follow-up meeting for veterinarians and farm managers a few weeks later.

Researchers at the Gluck Center, in collaboration with UKVDL and local practices, submitted a grant proposal to the Kentucky Thoroughbred Association (KTA) at the end of March outlining a comprehensive plan to investigate nocardioform placentitis' route of infection, conduct an epidemiological study, investigate early diagnostics and effective treatments for placental disease, and conduct a retrospective study on the athletic

(PLACENTITIS UPDATE ...)

success of foals born to mares that had been successfully treated for placentitis.

In July the KTA agreed to fund an investigation into nocardioform placentitis' route of infection, and Gluck Center investigators have performed preliminary research to determine an infective dose of the bacteria. Thirty mares at the University of Kentucky Maine Chance Equine Campus will be involved in the study that is expected to produce results when the mares foal next year.

In addition, Hagyard Equine Medical Institute and Woodford Equine Hospital clinicians have collected more than 200 samples from mares bred during the 2011 breeding season. These samples are currently being analyzed for the presence of nocardioform placentitis' causative bacteria.

Researchers also are collaborating with David P. Labeda, ARS, with the United States Department of Agriculture, National Center for Agricultural Utilization Research, in Illinois. A national expert on nocardioform bacteria, Labeda has provided recommendations regarding the study design and will provide advice as results are produced.

The UKVDL itself funded a detailed epidemiological study to identify risk factors associated with nocardioform placentitis. Eighty Central Kentucky farms responded to an initial survey. A redesigned survey with farm-focused rather than mare-focused questions is in the works.

Farms with high incidence and those with very low incidence of abortions are being investigated to identify potential risk factors. The Gluck Center hopes these initial research steps will provide valuable information on how to limit nocardioform placentitis outbreaks in Central Kentucky and elsewhere and lead to future research on how to effectively diagnose and treat this form of abortion and premature birth. UK

Mats Troedsson, DVM, PhD, Dipl. ACT, director of the Gluck Center and chair of the department of veterinary science at the University of Kentucky, submitted this information.

Gluck Center Groups Publish Multiple Papers in one Journal

David Horohov, PhD, William Robert Mills chair and professor in the immunology laboratory at the University of Kentucky Gluck Equine Research Center, had three research papers published in the September issue of *Veterinary Immunology and Immunopathology*, an international journal of comparative immunology.

Those papers, with authors, were:

- "Characterization of the interferon gamma response to *Lawsonia intracellularis* using an equine proliferative enteropathy challenge (EPE) model" by Allen Page, DVM, PhD candidate at the Gluck Center; Alan Loynachan, DVM, PhD, Dipl. ACVP, researcher at the University of Kentucky Veterinary Diagnostic Laboratory (UKVDL); Uneeda Bryant, DVM, researcher at UKVDL; H.F. Stills Jr., DVM, director of the Department of Laboratory Animal Resources at UK; Amanda Adams, PhD, assistant professor at the Gluck Center; Connie Gebhart, PhD, assistant professor in the Department of Veterinary and Biomedical Sciences at the University of Minnesota; Nicola Pusterla, DVM, PhD, Dipl. ACVIM, associate professor in the Department of Medicine and Epidemiology at the University of California, Davis; and Horohov.
- "Granzyme B-mRNA expression by equine lymphokine activated killer cells is associated with the induction of apoptosis in target cells" by Chong Liu, PhD candidate at Gluck; Alejandra Betancourt, research technician at Gluck; D.A. Cohen, PhD, professor in the Department of Microbiology/Immunology; Adams; Lingshuang Sun, PhD candidate at Gluck; and Horohov.
- "The effect of environment on interferon-gamma production in neonatal foals" by Sun, Adams, Page, Betancourt, and Horohov.

Another Gluck Center researcher, John Timoney, MVB, MRCVS, PhD, professor in the infectious disease laboratory, also had a paper published in the journal. The paper, "Association of *Streptococcus equi* with equine monocytes," was authored by Catherine Merant, former postdoctoral scholar at the Gluck Center; Abhineet Sheoran, PhD, former postdoctoral scholar at the Gluck Center; and Timoney. UK

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

STUDENT SPOTLIGHT

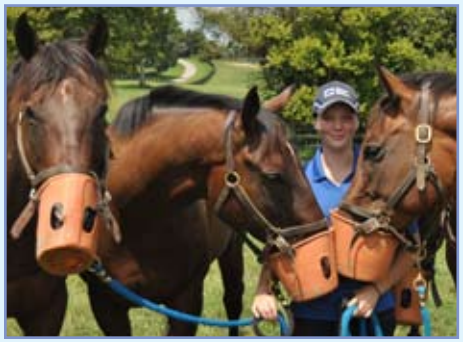
To highlight equine research projects by graduate and doctorate students in the University of Kentucky College of Agriculture, the Bluegrass Equine Digest newsletter will feature a different student's work in each upcoming issue.

Catherine Whitehouse

From: Market Drayton, Shropshire, England

Degrees:

- **BSc (Hons) in Equine Science from University of Lincoln; received a First Class with Honors and the Dean's Award**
- **Currently pursuing a master's in Animal Science (emphasis in Equine Nutrition)**



Catherine Whitehouse is the first recipient of the Kentucky Equine Research (KER) Lawrence Fellowship within the University of Kentucky's (UK) College of Agriculture. KER established this fellowship in honor of longtime employee Larry Lawrence and to fund a graduate student in a study program related to applied equine sciences. Whitehouse, also a former KER employee, anticipates graduating during the spring of 2012.

"Having the Lawrence Fellowship set up between UK and KER provided me with the opportunity to stay in Kentucky and pursue a graduate degree in my field of interest under the supervision of two inspirational mentors whom are both admired in the equine industry and within academia, Drs. Bob Coleman (PhD, of the University of Kentucky) and Joe Pagan (PhD, president of KER)," Whitehouse said. "Since moving to Kentucky two years ago for the 12-month internship at KER, I have fallen in love with the state and what the U.S. as a whole has to offer career opportunity-wise."

Whitehouse is currently conducting a digestibility trial for part of her research project, looking into associative effects on fiber digestibility when horses are provided high-starch diets.

"The techniques I'm using allow us to investigate how much information indirect methods, such as glycemic response tests and fecal pH, can tell us about the mechanisms of starch and fiber digestion occurring in the small intestines and hindgut of the horse alongside the digestibility data," she said. "My research is being conducted at KER's facility in Versailles.

"My main interests are in equine nutrition and the link with sport medicine, and I would say my discipline of focus is racehorses," she continued. "A personal goal of mine, through nutrition and sport medicine research, is to extend the longevity of horses' athletic careers (in conjunction with) new commercial products or feeding techniques and training regimes."

Whitehouse says she plans to work for KER fulltime as a researcher and technical assistant at the conclusion of her master's degree.

"This fulfills my aspiration of gaining experience in product development and balancing the research side and interacting with the feed industry and consumers," she explained. "I love being surprised by the research and the feeling you get when you look over your data and realize all your hard work during the trial paid off or that you discover something completely unexpected but equally exciting and it takes you off in a new direction.

"I cannot forget to mention the amazing horses which have allowed me to conduct my research project and the many research projects at KER," she added.

If you think Whitehouse looks vaguely familiar, you might remember her as the intern on camera when the Discovery Channel featured KER on an episode of *Dirty Jobs*. UK

Holly Wiemers, MS, is communications director for the University of Kentucky's Equine Initiative.

Soil Scientist Works to Preserve Early Equine History

African Americans played a major role in Kentucky's early equine history as jockeys, trainers, and grooms. A University of Kentucky (UK) soil scientist is working to make sure their stories, and others, are not forgotten.

For the past few years, Mark Coyne, PhD, professor of soil biology in the UK College of Agriculture, has led several efforts to introduce UK students to this rich history while they help maintain and improve Lexington's African Cemetery No. 2.

Located on East Seventh Street, the cemetery was built in 1869 by former slaves who were members of the Union Benevolent Society No. 2. This cemetery is the final resting place of at least 80 individuals who were well-known in early Thoroughbred racing circles. Some of the notable horsemen interred there include Oliver Lewis, winning jockey of the first Kentucky Derby; James "Soup" Perkins, the youngest winning jockey of the Kentucky Derby; and Abraham "Abe" Perry, trainer of the 1885 Kentucky, Tennessee, and Coney Island derbies winner. Isaac Murphy, who rode three Kentucky Derby winners, was buried there originally, but his remains are now at the Kentucky Horse Park.

Dr. Mark Coyne has led efforts to maintain and improve Lexington's African Cemetery No. 2.

In June Coyne and several UK students finished researching the cemetery's history with the help of the Young Equine Scholars Initiative, a UK Commonwealth Collaborative. Former UK President Lee T. Todd Jr. started Commonwealth Collaboratives in 2006, and the programs use UK's resources to address problems holding back the state's cultural and economic progress.

Through the Young Equine Scholars Initiative, students researched the history of about 80 individuals interred in the cemetery. The information they gathered was placed on signs that now hang throughout the cemetery at some of the notable individuals' gravesites and in three brochures that are available at the cemetery.

"As we've done the research, what we've found is that a lot of these individuals that were involved with the equine industry moved away but came back here to be buried," said Coyne, who is also a member of the cemetery's board of directors.

They also researched the history of the Kentucky Association Racetrack and posted information at the track's former site near William Wells

(SOIL SCIENTIST ...)

Brown Elementary School in Lexington.

Cemetery board member Yvonne Giles became involved with the cemetery while searching her families' genealogy. Forty-six members of her family are buried there, and she has done extensive genealogical searches on just about every gravestone in the cemetery. She helped teach the students involved with the Young Equine Scholars Initiative about genealogical research.

"We look at (the cemetery) as a modern-day laboratory to find your roots, conduct research, and learn how to maintain a historical site," said Giles, who is a UK food sciences alumna. "If we didn't have cemeteries we wouldn't have much of a history, particularly African American history, because a lot of our heritage is not written down."

As part of the initiative, a student designed a landscape plan to draw interest to the cemetery and improve its physical aesthetics. UK's Alpha Phi Omega service fraternity helped install the cemetery's main bulletin board, which lists historical information and holds brochures.

For the past two years, Coyne also has had a group of students from UK For Unity and Service In Our Neighborhoods (FUSION) volunteer their services. FUSION is a one-day service event in August during which students, faculty, and staff donate three hours of their time doing one of several community service projects. In 2010 FUSION students installed sign posts for historical information and weeded throughout the cemetery. With a grant from the UK Ag and HES Alumni Association, FUSION students this year mulched and weeded around trees and shrubs in the cemetery, per the landscaping plan's design.

Sarah Jones, a junior from Louisville, was this year's FUSION site leader for the students who volunteered their time at the cemetery.

"I wanted to do a project that would allow me to do outside work and get my hands dirty," she said. "The cemetery has so much history and is well-maintained but needed a little work. Plus, it is such an important part of this area and Lexington."

The UK Ag and HES Alumni grant will also provide money for tree removal and tree planting at the cemetery that will occur this fall and next spring.

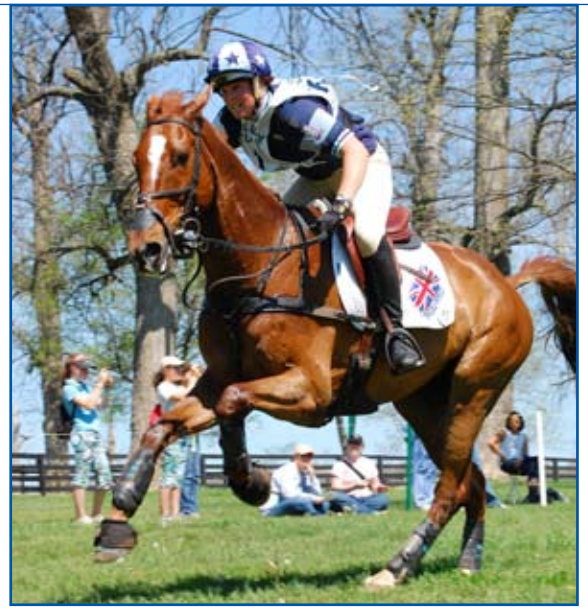
Katie Pratt is an agriculture communications specialist at the University of Kentucky.

LECTURE: REGULATION OF MUSCLE MASS IN HORSES

Kristine Urschel, PhD, assistant professor of equine science in the University of Kentucky's (UK) Department of Animal and Food Sciences, lectured on "Muscle Power: Regulation of Muscle Mass in Growing, Athletic, and Aging Horses" at the UK Veterinary Diagnostic Laboratory Aug. 25. Her lecture covered factors regulating muscle protein accretion in horses and relevant research in humans, pigs, and rats, as equine research in this area is limited.

"Exercise and dietary protein together provide a big jump in protein synthesis," Urschel said. "Exercise, amino acids, protein, and carbohydrates result in the greatest jump in protein synthesis."

Urschel said this correlation is directly relevant to horse owners because protein synthesis affects muscle growth. Muscle mass generally equates to greater power output; more muscle allows both greater generation of force and faster muscle contraction. For the equine athlete, this increase might translate into more explosive movement for cutting horses; greater jumping ability for hunters, jumpers, and eventers; increased suspension and flexion for dressage horses; and enhanced speed for racehorses.



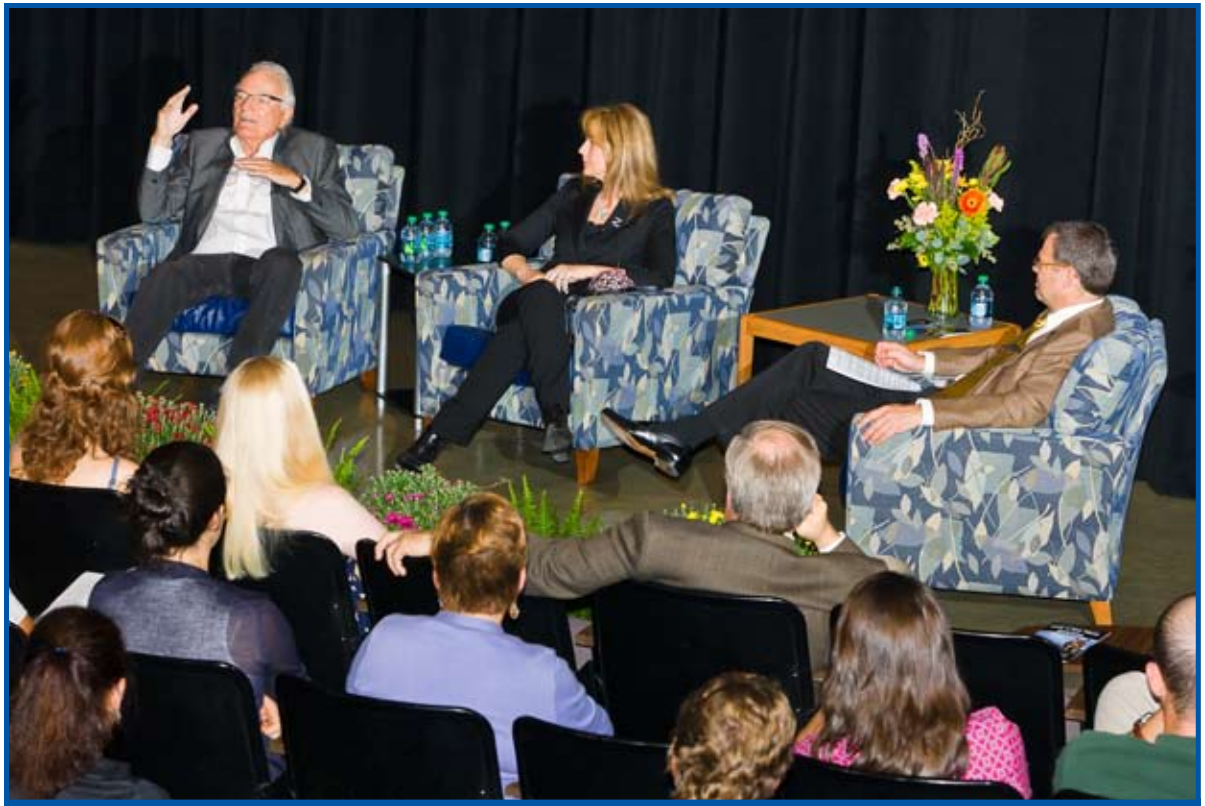
Muscle mass equates to power output.

Fueled by exercise and protein, muscle mass is the balance between the processes that synthesize and break down protein. Nutrition, age, hormones, and physical activity can all affect synthesis and breakdown.

"Muscle works as a storage unit for amino acids that the body uses for other metabolic functions," Urschel explained. "Amino acids, exercise, and insulin activate pathways that lead to muscle synthesis."

Muscle power changes over a horse's lifespan, with three phases (adolescent, adult, and aging) that can be manipulated. The greatest muscle mass increase comes with both increased exercise and increased dietary protein, according to Urschel.

"Adolescent horses are putting muscle down," Urschel said. "With an increase in exercise, young horses between the ages of 1 to 3 will exhibit a subtle increase in muscle mass over time that naturally follows development."



UK AGRICULTURAL COMMUNICATIONS SERVICES

Jerry and Ann Moss, owners of 2010 Horse of the Year and three-time champion older mare Zenyatta, spoke at the University of Kentucky (UK) Equine Initiative Distinguished Industry Lecture Series held Sept. 14. Nearly 200 people attended the event at Seay Auditorium in the Ag North building on UK's campus. Hagyard Pharmacy sponsored the event. Dan Liebman, former editor of *The Blood-Horse* magazine, interviewed the Mosses, who spoke about career successes outside of Thoroughbred racing, dreaming big, and their remarkable journey with Zenyatta. The Distinguished Industry Lecture Series showcases notable leaders in the equine industry and provides students and the general equine community a unique opportunity to hear more about them in an informal conversational setting. The event was the fourth in a series that began in November 2009. To read more about the topics the Mosses covered in this session, visit TheHorse.com/18834. For more information about this event, including photos and video from the evening, visit www.ca.uky.edu/equine.

(MUSCLE MASS IN HORSES ...)

Muscle mass also is a determinant of mobility and quality of life. Horses, like humans, are prone to injury and accident as they lose muscle mass, and the aging process has a negative impact on muscle's responsiveness. In general, with age, a lower rate of protein synthesis and increased protein breakdown result in a net loss of muscle.

But, Urschel pointed out, studies in older men show that exercise makes muscle more sensitive to feeding, which might prove to be an important parallel in the horse world. Extrapolating from research on rats, Urschel also theorized that low-grade or chronic inflammation in aged horses might interfere with muscle-building pathways.

Owners and trainers in the Standardbred and Thoroughbred industries often want to know if a higher fat-free muscle mass can help a horse to run faster, Urschel said. But the comprehensive research needed to answer these questions about the effects of diet and exercise on muscle lack funding so far. UK

Karin Pekarchik is an editorial officer in UK's Agricultural Communications Services.

UPCOMING EVENTS

Oct. 27, 4 p.m.
Department of Veterinary Science Equine Diagnostic Research Seminar Series. Laurent Couetil, DVM, professor of Large Animal Medicine at Purdue University, will speak on upper respiratory diseases in horses. Veterinary Diagnostic Laboratory, Lexington.