







# **EQUINE SCIENCE CENTER**



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Stakeholder Report July 2011 - June 2012

-RESEARCH-

**Equine Science Center** 

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# Message from Karyn Malinowski, Director

Throughout 2011 the Rutgers Equine Science Center celebrated its tenth anniversary. We celebrated in a big way on August 4 with a VIP Gala hosted by the Standardbred Breeders and Owners Association of New Jersey at the Commissioners Club of the MetLife Stadium.

Since 2001 the Center has established itself prominently within the state, nationally, and internationally through its thoughtful business plan, research and outreach programs, partnerships with state and federal agencies and private entities, dynamic website, and the widespread recognition and acknowledgment it has received as a result of the impacts of its programs. Undergraduate and graduate students who have participated in these programs have gained valuable experience yielding a high success rate of acceptance into veterinary and graduate programs in addition to producing students with skills needed to better manage horses in the industry.

The mission of the Equine Science Center - "**better horse care through research and education to advance the well-being of horses and the equine industry**" - hasn't changed since 2001. Center research programs utilize the expertise of multi-disciplinary, interdisciplinary, and inter-institutional teams of faculty and staff which result in measurable outcomes and impacts.

The Center has taken its commitment to horses and the equine industry to new heights, and is in the middle of an ambitious \$6.5 million campaign to expand its faculty, research capabilities, programming, and outreach. I invite you to visit our website, spend time with us during an Open House, explore and learn about the pivotal role your monetary gift can play in training new generations of knowledgeable, passionate equine advocates and specialists.

The Center continues to compete for grants, contracts, and donations. For the period July 1, 2011 – June 30, 2012, Center core Department of Animal Science faculty and staff procured over \$170,000 in extramural funding and \$276,627 in donations and gifts.

The Equine Science Center has gained the respect and credence of equine enthusiasts in the Garden State and beyond. The New Jersey horse industry relies on the Equine Science Center to fill a unique role that beckons the support of the industry because it:

- Speaks for the entire horse industry
- Provides credibility for the horse industry
- Has no hidden agenda
- Is the sole source for programming to ensure the industry's viability and vitality
- Is the place of education for the future leaders of the horse industry



With your partnership and generous support, the Equine Science Center looks forward to another decade of excellent service to the horse industry.

Best,

Theory

Karyn Malinowski, Ph.D. Director, Equine Science Center

# CENTER OVERVIEW

# A unique equine academic environment.

The Equine Science Center at Rutgers, The State University of New Jersey, is the only equine-related academic entity in the country that assembles faculty, students, and staff from multiple disciplines and departments, both from within and outside the university. Together, our expert collaborative teams identify, research, and provide solutions for challenges facing horses, horse owners, and the horse industry.

A center for advanced learning in large animal sciences.

As the rural landscape of New Jersey changes, fewer young people with interest in animal and veterinary

sciences have sufficient exposure to large animals. However, our graduates are consistently recognized by veterinary schools for the experience with large animals they receive at the Equine Science Center. As a result, a remarkably high percentage of our students are accepted by veterinary schools, and we are proud to note that many have gone on to become practicing large-animal veterinarians.

# A center for discovery, practical research, and applied science.

The Equine Science Center is a hub for mission-oriented, practical research - a critical component in examining and solving equine-related issues. In addition to ongoing research in fundamental equine subjects, some of our recent research topics include the role of natural food products for use in horses; ensuring the well-being and level playing field for racehorses and other equine athletes; enhancement of immune function in all horses; care and management of young and older horses; how specific bacteria might influence the development of laminitis; and the role of horses in the environment.

# A center dedicated to public outreach and industry values.

The Equine Science Center emphasizes outreach as a critical value, and we consistently share the results of our research with the public and the equine industry. We are vigilant in reaching out to



the equine community in a number of different ways, including our annual Stakeholder's Meeting and the Equine Science Update; programs through the Rutgers Cooperative Extension offices in each of New Jersey's 21 counties; a popular 4-H Youth Development program; and a series of horse management seminars, webinars, twilight field meetings, and workshops as well as equine courses open to the public through the Office of Continuing Professional Education. We also reach out online (esc.rutgers.edu) through our dynamic website which includes popular features such as the 'Ask the Expert' page, archived webinars and podcasts, and virtual tours brimming with valuable information. "Equine Science 4 Kids," is an online classroom featuring games, interactive activities, and a little horseplay for children of all ages.

# A vision for the future.

In the course of a single decade, the Equine Science Center has become vital to the future of the horse industry. As the sole source for research and extension programming, we not only educate leaders, but also ensure the entire industry's viability, visibility, and vitality.

The Center's website continues to be a potent marketing tool for sponsors, donors, and prospective students, in addition to its more traditional role as an educational instrument and resource center. In fact, one of the top ten pages visited is the fact sheet describing the School of Environmental and Biological Sciences (SEBS) Equine Sciences minor.

Center website traffic continues to escalate, up seventy-five percent from last year. From July 1, 2011 – June 30, 2012, the Center's website received:

- 5.9 million hits
- Over 1100 visits per day
- 230,000 unique visitors
- Average page view length of 61 seconds



The Equine Science Center also serves as an important element of the SEBS teaching program. Horse Management and Equine Nutrition, are courses offered online and in the classroom to nonmatriculated students through the Office of Continuing Professional Education. This provides an opportunity for both experienced and inexperienced horse owners/trainers/breeders, not only locally but as far away as New Zealand, to update or gain new knowledge on how best to manage and feed their horses. Developing Future Leaders for the Equine Industry and Advanced Equine Health Care and Management are courses developed by the Center and open to adult learners and continuing education students. These courses brought enhanced revenue to the Department of Animal Sciences and the Center.

Core Center faculty members, who reside in the Department of Animal Sciences, are pivotal to the success of undergraduates who gain hands-on experience by participating in independent research. Over the past year these core faculty members provided research opportunities to 24 students and generated 45 credit hours valued at over \$16,500 in tuition. In 2012 alone, 24 Animal Science Pre-Vet students applied to veterinary school and 16 were accepted to at least one veterinary school in the U.S. and abroad.

On the extension and outreach side, the Center is known for its ability to share science-based information in formats that are usable by people around the world. Our website serves as a wonderful portal for "everything equine." Descriptions of outreach programs can be found later in this report.

In 2012, the Center posted a list of refereed publications by Center faculty and students related to the equine athlete. Visit the Center's website at: esc.rutgers.edu/downloads/Center\_Research.pdf.

# RUTGERS UNIVERSITY BOARD OF EQUINE ADVANCEMENT

The mission of RUBEA is to assist the Rutgers Equine Science Center in its decisions regarding its equine teaching, research, and outreach; and to promote and support these activities through fund-raising and advocacy efforts.

OFFICERS:	MEMBERS:	
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	Carey A Williams Ph D	

# Report on Major Programs: Equine Science Center Research

# Horse Health & Well-Being

# Can a Bacterial Infection of the Hoof Laminae Contribute to the Incidence of Laminitis?

The objective of this study, under the leadership of Janet Onishi, from the Department of Biochemistry and Microbiology, was to research and evaluate the possibility that a bacterial infection of the laminae contributes to the disease laminitis. Onishi hypothesized that certain questions in the field could be understood if bacterial pathogens played a more direct role in the disease. Results of her studies indicate that bacterial pathogens may be playing a larger role in laminitis than currently appreciated and that results of both studies led to new questions and opportunities for further investigation.

Although bacteria may be involved in both chronic and

#### KEY MESSAGE

Although bacteria may be involved in both chronic and acute laminitis in ways that are not fully understood, it is critically important to inform horse owners that an antibiotic regimen is NOT recommended for the treatment of horses suffering from laminitis. Strategies to reduce exposure of horses to potential pathogens in the environment are recommended as an attempt to prevent chronic laminitis.

acute laminitis in ways that are not fully understood, it is critically important to inform horse owners that an antibiotic regimen is NOT recommended for the treatment of horses suffering from laminitis. In fact, with the potential that a biofilm infection is involved in chronic laminitis, the worst course of action that a horse owner could take would be to purchase antibiotics over the internet and begin treating a horse with unresolving lameness. Antibiotic treatment of biofilm infections are well known to be resistant to drug action and will increase the risk of antibiotic resistant bacteria within the equine community.

Research is clearly needed to establish, with a larger study set, that a biofilm infection is indeed associated with chronic laminitis and whether experimental approaches currently studying biofilm infection offer new treatment opportunities. Based on the types of bacteria recovered from the laminar tissue of chronically laminitic horses, it is possible that horses could be exposed to the bacteria as the organisms are likely to be present in soil, fecal matter, or water. Onishi suggests that the results of her research leads to the hypothesis that chronic laminitis is preventable.

Strategies to reduce exposure of horses to potential pathogens in the environment are recommended as an attempt to prevent chronic laminitis. In the acute laminitis study, the results are based on the carbohydrate overload model and indicate that the systemic and localized inflammatory changes well-known to occur in the model are associated with sudden and broad changes in the cecal bacterial communities. It is becoming clearer that interactions between the mammalian host and gut bacteria affect numerous biological processes. Determining whether abrupt changes in the gut bacterial communities occurs in horses that naturally develop acute laminitis is a logical question to try and answer. Continued research opportunities in the field are being considered.

# NMR-based Metabonomic Analyses of Horse Serum: Detection of Metabolic Markers of Disease

#### **KEY MESSAGE**

Young Standardbred horses that develop hock osteochondrosis dissecans (OCD) differ metabolically from those that do not develop the disease despite similar management and genetic backgrounds. NMR-based metabonomic analyses may detect metabolic differences before the lesions appear in nursing foals. The metabonomics research Sarah Ralston has been pursuing with her colleagues, Istvan Pelczer at Princeton University, Metabolon, Inc., and Hanover Shoe Farms, is aimed at identifying the metabolic profile associated with the development of osteochondrosis dissecans (OCD) lesions in the joints of rapidly growing horses and discovery of ways to prevent the lesions in genetically predisposed horses. Research over the past five years has revealed that there are distinct metabolic and genome differences between Standardbred horses that do, and those that do not develop lesions, despite having similar genetic and environmental histories.

Collaborative studies at the University of Minnesota by Annette McCoy and Molly McCue investigating the genomes of affected and normal horses revealed that there are genetic differences too. Ralston found that with a blood sample taken from a nursing foal before OCD lesions appear, one can actually predict with a fair degree of accuracy (85%) whether or not it will develop the problem. In 2011-2012, mass spectroscopy and liquid chromatography were used to: 1) better define the metabolic differences between normal and predisposed horses and identify the metabolic pathways that are defective and; 2) to suggest nutrients that might be beneficial in perhaps preventing the problem from occurring in genetically predisposed foals.

Ralston received a grant from the Equine Science Center in 2012 to continue this line of research and test the hypothesis that it will be possible to reduce, if not prevent, the occurrence of OCD lesions in young Standardbreds known to be at risk. She is also collaborating with colleagues in Australia to develop a similar data base for Thoroughbreds. Blood samples were collected from over 300 young Thoroughbreds, all of which were examined radiographically for the presence or absence of OCD lesions, which are presently being processed at the University of New South Wales in Sydney.



# Supplementation of Ascorbic Acid in Weanling Horses Following Prolonged Transportation

Ralston in collaboration with one of her former George H. Cook Honors students, Michelle Stives, documented the benefits and potential problems with supplementation of vitamin C following prolonged transportation stress. Vitamin C (Ascorbic acid) is synthesized in the liver of horses, which do not have a dietary requirement under normal conditions. Ralston documented in previous research that transport for prolonged periods of time (6 to 12 hours) depletes blood concentrations of the vitamin and can compromise immune function, contributing to the risk of "shipping fever" in transported horses. Weanlings

#### KEY MESSAGE

If horses are given a vitamin C supplement during stressful events, such as transportation, it can increase immune function and prevent "shipping fever". If vitamin C is given during non-stressful periods, then the normal synthesis of the vitamin is suppressed.

that were transported in a single trailer from North Dakota and Canada to Rutgers received either no vitamin C or 5 grams vitamin C twice a day for either five or ten days after arrival. It was documented that plasma vitamin C concentrations in the weanlings upon arrival were reduced, and that supplementation with vitamin C did increase plasma concentrations. However, if the supplementation was continued past the first 5 days after arrival, when the supplement was stopped, the horse's plasma vitamin content plummeted and stayed below normal for over three weeks. This coincides with the time point when the weanlings were relatively unstressed and adapted to their new surroundings. It was hypothesized that supplementing when horses were not stressed may have suppressed the normal endogenous synthesis of vitamin C and/or enhanced its excretion. Based on this research, it is recommended that horses that are severely stressed, especially by prolonged transport to a new place, be supplemented with vitamin C (0.02 mg per kg body weight) but ONLY during the period of stress.

## Impact of Age and Exercise on Antioxidants and Oxidative Stress in Horses

The musculoskeletal system is a common area for injury in horses undergoing intensive exercise. Oxidative stress and inflammation commonly occur after exercise; chronic and excessive concentrations of markers of oxidative stress and inflammation can lead to injury. In addition, the age of a horse undergoing exercise may affect its ability to recover and adapt from intensive exercise. With an exercise training protocol, horses may be able to enhance their ability to cope with the excessive oxidative stress and inflammation that accrues from exercise. Preliminary studies by Danielle Smarsh in Carey Williams' lab are ongoing to verify the

#### KEY MESSAGE

Aging horses experience increased oxidative stress and inflammation during exercise, which can lead to injury. With a proper regimen of exercise training and dietary intervention it may be possible to achieve maximal performance from horses without risk of injury.

proper methods to analyze antioxidants and oxidative stress measures in equine skeletal muscle in mature horses. The next step is to examine the effect of intensive exercise training on oxidative stress, antioxidant status, and muscle metabolism of young racehorses. This will be done by using the Center's equine exercise physiology highspeed treadmill to perform exercise tests and measure concentrations of markers of oxidative stress and inflammation change in skeletal muscle and blood. This knowledge will aid in determining if a moderate level of exercise training and acute bouts of intensive exercise are enough to cross the threshold needed to generate the maximum performance from horses, without risk of injury or excessive oxidative stress. This can also help determine if there is a need for dietary intervention with increased levels of antioxidants in diets of young exercising horses.



Unlocking the Relationship Between Exercise, Inflammation, and Insulin Signaling in Horses

#### KEY MESSAGE

Heat shock proteins (HSPs) are involved in repairing damaged proteins, insulin sensitivity, and the anti-inflammatory response. Age-related differences of HSPs and how these differences contribute to insulin resistance and loss of tissue function are currently under investigation. The labs of McKeever and Malinowski are supporting the research of Ryan Avenatti who is investigating the role of heat shock proteins (HSPs) in proper insulin signaling in equine skeletal muscle. Heat shock proteins are molecular chaperones that repair damaged proteins in every cell type, and are an important part of the adaptive response to exercise in skeletal muscle. Activity of HSPs declines with age, and recent research in diabetic humans and rodent models with diabetes have indicated that HSPs have an anti-inflammatory role, acting to shut off inflammatory signaling pathways in skeletal muscle, thereby restoring

insulin sensitivity. In humans, skeletal muscle is responsible for 75% of insulin-mediated glucose uptake, and since over 50% of the body mass of horses is made up of muscle (compared to 35 - 40% in humans), understanding the function of HSPs and other molecular mediators of inflammation and insulin signaling in equine skeletal muscle will have profound implications for horses that are aged and insulin resistant.

Initial work carried out during the summer of 2012 was meant to characterize the heat shock protein response to acute exercise in equine skeletal muscle, identify other appropriate molecular signaling mediators for study, and to optimize experimental methods for quantitative study of these factors in equine tissue. This basic work will pave the way for the investigation of age-related differences of HSPs and other molecules, how these differences contribute to insulin resistance and loss of tissue function, and what methods can be undertaken to restore HSP activity and proper insulin signaling in aged and insulin resistant horses.

#### Does it Work? Testing the Efficacy of Feed Supplements

Ken McKeever has been studying the efficacy of natural food products in his lab for over a decade. In the past, research focused on the nutritional content and availability of various feedstuffs with an eye on providing a balanced ration to meet the energy and nutrient needs of the equine athlete. More recent research has examined the physiology of energy homeostasis with the goal of understanding how to improve the delivery of metabolic substrates to increase performance and to speed recovery from exercise. To that end, a whole new industry has emerged around

<u>KEY MESSAGE</u> Before spending money on supplements for horses ask yourself three questions: Is it safe? Is it legal? Does it work?

dietary supplements that purportedly alter metabolic pathways to improve nutrient utilization and to ultimately enhance performance.

Unfortunately, many of the new dietary supplements and other performance-enhancing products that have come on the market are being pushed with little scientific basis for the assertions made on their labels. In many cases, horses were not used in trials to demonstrate efficacy of these new and often expensive avant-garde dietary supplements and nutraceuticals. So how can horse owners determine if a new supplement improves performance or has true potential to improve athletic capacity?

A simple series of questions should guide the decision to use new dietary and other supplements in equine athletes. Is the purported performance-enhancing product safe or unsafe? Is it legal or illegal? And lastly, is it effective or ineffective? All are valid questions that should be asked by horse owners and trainers. Unfortunately, many of the nutritional products being given to horses have not been tested for safety. Some may actually be "natural" sources of banned substances and thus illicit according to rules of competition. However, if a product is safe and legal, the last question is the one most horse owners want to have answered before they buy a product. So, how do we know if a product can help a horse perform better?

The most common problem associated with the marketing of these products is an excessive reliance on anecdotal information gained from testimonials. Research on the use of ergogenics and nutraceuticals in human sports medicine has shown efficacy for many of the most popular products on the market. The most classic examples are the long list of ubiquitous nutritional beverages that provide electrolytes and carbohydrates. Research has also shown that many of these products have no beneficial effect. Equine sports nutrition should use the same sound, scientific principles to provide information to horse owners and trainers.

#### Feed Supplements to Maintain Performance and Health

<u>KEY MESSAGE</u> Natural food products show potential to reduce post-exercise inflammation and recovery time in horses. Recent reports in the literature confirm the links between exercise, inflammation, immune system response and the use of food components and nutraceuticals to modulate these responses. To that end, Ken McKeever with students and colleagues examined the anti-inflammatory effects of a number of food extracts in horses. These studies were funded

by the US Department of Defense with the rationale that food extracts with anti-inflammatory properties could replace or reduce the use of non-steroidal anti-inflammatory drugs (NSAIDs) for the reduction of delayed onset muscle soreness in humans. The great thing about this body of work is that both humans and horses are benefiting from the results.

Equine athletes, like their human counterparts, suffer from challenges to the immune system and inflammation related to exercise. Published information and current research have sought new anti-inflammatory medications to replace phenylbutazone the most common NSAID given to horses. Work currently being conducted at several feed supplement and pharmaceutical companies is examining the effects of food extracts on cytokines and other markers of inflammation. The endocrine and immune function responses to the challenges of exercise and aging are very similar in horses and humans. Much of the current exploration into the use of nutraceuticals in equine athletes is centered on the immune enhancing and anti-inflammatory properties of those products. McKeever and colleagues have recently published several studies that examined the effects of various pharmaceutical and nutraceutical interventions on exercise capacity. Treadmill tests have been used to measure aerobic and physiological markers of performance.

The general goal of the research was to determine if the chosen extracts would alter markers of performance as well as cytokine markers of post-exertion inflammation and muscle damage in horses. Pharmacokinetic and pharmacodynamic information from these experiments answered key questions that should be asked when considering if a supplement should be used in the care of equine athletes. This research found that orange peel extract reduced post-exercise recovery time and black tea extracts reduced inflammatory cytokines, ginger extract increased the expression of inflammatory cytokines; however, it also decreased recovery time, and cranberry extract decreased the inflammatory response. It was also found that exercise-induced increases in inflammatory cytokines were seen in both muscle tissue itself as well as blood.



In 2009, the Center identified the need to address the concern and consequences of the growing unwanted horse population. Answers to horse ownership questions such as: what to do when one can no longer adequately care for a horse, or what to do if one is looking to purchase a horse, are available on the new Responsible Horse Ownership page of the Equine Science Center website, an initiative led by Sarah Ralston. Ralston's newest initiative is the development of the New Jersey Horse Information Network (NJHI) organization, which is partnering with the Rutgers Equine Science Center, NJ Agricultural Experiment Station Cooperative Extension, NJ Horse

#### KEY MESSAGE

Many equine-associated establishments are forming a volunteer organization comprised of professional and credible personnel to assist the equine community in answering any questions.

Council, New Jersey Department of Agriculture's Equine Advisory Board, County Animal Response Teams (CARTS), 4-H Youth Development program, Pony Clubs and the veterinary community to coalesce the vast resources available through these existing entities into a more accessible and userfriendly network both statewide and on a regional basis. The goal is to amass as comprehensive a list of professional and commercial resources as possible for each region of the state, in addition to a list of credible, experienced mentors who can offer one to one assistance to horse owners in a wide variety of areas.

To develop regional support systems, NJHI is establishing, and continues to seek, volunteers who are willing to be trained as ambassadors and mentors to disseminate resource material and provide referrals to owners and enthusiasts in their local equine community. Those interested in volunteering need to complete a brief survey: njhorseinfo.org/membersurvey.html. NJHI organizers will determine the level and type of assistance each volunteer is willing to provide. Individuals interested

in participating should contact Ralston at ralstonymd@msn.com. Once the network is established, a vital key to the organization's success will be spreading the word within the equine community. NJHI intends to distribute flyers and booklets at auctions, rescues, horse shows, and feed and tack stores. Additionally the organization will rely on assistance from a team of trained members who will be familiar with whom they can call upon in their region if made aware of a horse owner or horse in need. NJHI will strengthen all aspects of the horse industry in New Jersey and improve equine well-being and the enjoyment of these magnificent animals throughout the Garden State.



# Farm and Land Management and Environmental Stewardship

## Animal Waste Management Plan Progress

#### KEY MESSAGE

All New Jersey farmers with livestock must comply with the waste management regulations or owners will be fined and lose their "Right to Farm" protection. The New Jersey Department of Agriculture adopted regulations in March 2009 requiring all livestock farm owners to responsibly manage manure generated on their operations--including those with horses, dairy cows, cattle, swine, goats, sheep, poultry, and all other domesticated species defined as livestock. All New Jersey farmers with livestock were required to be in compliance with these regulations by March 16, 2012.

The Animal Waste Management regulations require all farms with any livestock to comply with the following **General Requirements** of the rule:

- 1. Agricultural animal operations shall not allow animals in confined areas to have uncontrolled access to waters of the state.
- 2. Manure storage areas shall be located at least 100 linear feet from waters of the state.
- 3. Land application of animal waste shall be performed in accordance with the principles of the NJDA Best Management Practices (BMP) Manual.
- 4. Dead animals and related animal waste resulting from a reportable contagious disease or an act of bio-terrorism shall not be disposed of without first contacting the State Veterinarian.
- 5. Any person entering a farm to conduct official business related to these rules shall follow bio-security protocol.

In addition to the General Requirements listed above, all livestock operations with 8 to 299 "Animal Units" (one Animal Unit = 1,000 pounds) were required to implement an Animal Waste Management Plan by March 16, 2012. This plan must be in accordance with the New Jersey Department of Agriculture Manual – "On Farm Strategies to Protect Water Quality". This is available on the New Jersey Department of Agriculture website (state.nj.us/agriculture). Exact requirements will vary with size and density of operation.

According to New Jersey Statute (N.J.S.A. 4:1C), farmers must comply with all relevant federal and state statutes and regulations in order to maintain "Right to Farm" protection. New Jersey's Right to Farm Act protects responsible commercial farmers from public and private nuisance actions and unduly restrictive municipal regulations. Failure to comply with the Animal Waste Management Rule may result in loss of these protections and may be fined up to \$1,000 per day for each violation as determined.



#### - RESOURCES -

# It Is Not Too Late to Complete Your Animal Waste Management Plan (AWMP)

The Department of Agriculture is continuing to accept the required plan declaration pages. It is essential that a plan be completed to avoid any penalties related to non-compliance. To get started, contact either your local Rutgers Cooperative Extension office or view the Animal Waste Management page of the New Jersey Department of Agriculture's website.

For more information about complying with the general requirements of the Animal Waste Rule and about completing an AWMP, please go to the Rutgers Cooperative Extension website.

## NJ Department of Agriculture: nj.gov/agriculture/divisions/anr/ agriassist/animalwaste.html

Rutgers Cooperative Extension: njaes.rutgers.edu/animal-wastemanagement

Rutgers Cooperative Extension Office Contact Numbers:

Hunterdon County(908) 788-1338Salem County(856) 769-0090Sussex County(973) 948-3040Burlington County(609) 265-5050

# Ryders Lane Environmental Best Management Practices Demonstration Horse Farm

The Ryders Lane Best Management Practice Demonstration Horse Farm continues to carry out its mission of conducting basic and applied research and educational programs regarding horses and the environment. Besides being a jewel in the crown of the Center's programs and activities, it also has been a very effective rotational grazing setup for the Center's research horses. During the grazing season, 12-15 horses were housed without the need for supplemental hay. During the reporting period, we were able to provide many educational opportunities for horse farm owners and managers. Some of the educational events and research are listed below.

On June 9, 2011, a group from Seaton Hackney Stables in Morris County came to the Ryders Lane Farm for a guided tour. Representatives from the facility and the Morris County Parks and Recreation Department needed advice on how to approach environmental issues at the historic farm. Mike Westendorf and Carey Williams explained the various renovations implemented at the Ryders Lane Farm (addressing water quality, pasture management, and manure disposal issues) and how they could fit into the Seaton Hackney renovation.

In mid-September 2011, a new set of informational brochures was produced to complement the educational posters currently on display at the Ryders Lane Farm. The information on each poster was reorganized to highlight the important points on a tri-fold brochure so that guests can take the information home with them. These brochures are now on display and available to the public at the entrance to the self-guided tour. An audio tour is also being designed to go along with the brochures and self-guided tour. The audio tour will feature explanations of each station, accessible by computer or mobile device. A participant could access the audio segments either at home by looking at a map of the farm or while taking the self-guided tour.

On September 29, 2011, the Equine Science Center hosted a "Pasture Walk" workshop. Approximately 30 participants attended, ranging from horse farm owners to college students and horse enthusiasts. Center faculty and staff (Mike Westendorf, Carey Williams, Chris Obropta, Clint

Burgher, Laura Gladney, and Karyn Malinowski) explained in detail each of the renovations and how they could be applied to individual farms. Program evaluations indicated that participants found the workshop very useful.

On November 17, 2011, a group of students from Gloucester County College traveled to Rutgers as part of a new articulation agreement between GCC and Rutgers. Students in the Associate in Science - Equine Science program take a curriculum designed jointly by Rutgers and GCC to become qualified for admission into the Rutgers School of Environmental and Biological Sciences Bachelor's degree program upon receiving their Associates degree from GCC. This new program was led by Emily Allen from GCC and Sarah Ralston from Rutgers. During the tour, Ralston and Williams described how researchers use the farm for both the Young Horse Teaching and Research Program and environmental research and demonstrations. Program Associate and Cook College alumna Laura Gladney answered questions about student life and coursework at Rutgers.

# Environmental Impacts of Excessive Nutrients in Equine Rations

Several studies performed at the Center investigating whether rationss high in phosphorus and/ or nitrogen in the form of high protein is excreted at the same rate as the excess. Overfeeding can result in overspending on feed, over-conditioned horses, nutrient interactions harmful to horses, and may also have destructive influences on the environment. Phosphorus and nitrogen are particularly a concern because of the effects upon water quality and the environment when overfed.

# Effects of Excess Dietary Phosphorous on Fecal Phosphorous Excretion

#### KEY MESSAGE

Over-feeding inorganic phosphorous supplements significantly increases phosphorous in manure making surface runoff a higher risk. Michael Westendorf and Carey Williams examined the influence of excess dietary phosphorous in horses on excretion of phosphorous in manure. This experiment showed that feeding an inorganic source of phosphorous above concentrations recommended for horses by the National Research Council (NRC) resulted in greater excretion of phosphorous. Phosphorous is quite stable in

the manure pile or as spread on pastures or tillable land. It will not volatize into the atmosphere and is less likely than nitrogen to leach into groundwater supplies. The greatest risk from elevated phosphorous in manure is surface runoff. Horse manure should be tilled into the soil when spread or dragged when spread on pastures.

# Dietary Protein Affects Nitrogen and Ammonia Excretion in Horses

Adding unnecessary protein to the diet of horses is a common practice which leads to the excess being excreted in sweat, feces, and urine as nitrogen. Higher amounts of nitrogen in the feces and urine must be managed in order to prevent consequences to the environment such as water contamination and decreased air quality. Ammonia contamination has the potential for at least short-term adverse effects on both humans and horses. A study by Williams, Urban, and Westendorf evaluated nitrogen levels in urine, feces, blood, and the air surrounding stabled horses when digestible dietary protein was fed in excess of recommended values.

Results showed that elevating protein concentrations in horses' diets past recommended levels increases the ammonia and nitrogen excreted in manure, the ammonia in the atmosphere,

#### KEY MESSAGE

Elevating protein concentrations in horses' diets past recommended levels increases the ammonia and nitrogen excreted in manure, the ammonia in the atmosphere, and the urea nitrogen in the blood. Since protein is expensive and is usually fed in excess by horse owners with active, mature horses, save your wallet and the environment by feeding recommended levels of protein.

and the urea nitrogen in the blood. Elevated ammonia concentrations seen in this study indicate that overfeeding protein influences air quality.

# Horse Manure Composting Projects at Rutgers University

Rutgers University and the Equine Science Center have been increasing composting research capacity. This will allow Rutgers to continue to find practical and low-cost options for manure management on horse manure farms. Some of the composting projects currently underway are listed below:

- A composting site has been chosen and is in use for composting all manure produced on the Rutgers University Animal Farm.
- A program for sales and off-farm disposal of compost has been initiated. This brings needed revenue to the farm and helps the farm's nutrient management by exporting waste off site.
- Research investigating the compostability of different bedding materials is ongoing.
- Several open storage pads are being designed and will be used as composting areas to compare covered vs. uncovered horse manure, different aeration methods for composting, and pathogen and nutrient runoff from compost pads.

# KEY MESSAGE

The demonstration horse farm at Ryders Lane will continually evolve as a best management practices example of "what to do" to minimize negative environmental impacts for equine operations around the region. A new pasture management research project began in 2012 at the Ryders Lane Farm. Laura Gladney is exploring the relationship between soil quality, pasture plants, and grazing horses. The project will compare these parameters on continuously versus rotationally grazed pasture systems. It will utilize two of the large pasture systems at the Ryders Lane Farm over two years to collect monthly samples and measurements. Data from this project will allow researchers to compare environmental and economic impacts of the two different grazing systems.

## Anaerobic Digestion of Equine Stall Waste

KEY MESSAGE Horse manure and stall waste remain an option for anaerobic digestion and the production of methane gas as a biofuel. The goal of this project from Donna Fennell's lab was to establish technical parameters for anaerobic digestion of equine stall waste either alone or co-mingled with other biomass with application to on-farm or regional facilities. One horse (defined as a 1000 lb animal) produces 37 pounds of feces and 2.4 gallons of urine per day, for a total of about 60 lbs of waste. Stalled horses require up to 20 lbs of bedding per day. Combined, this accounts for up to 13 tons of waste per horse per year with bedding constituting

about 25% of the wet weight. Horse waste is often spread on land either before or after composting. Improper disposal of animal wastes results in release of nutrients, microbial contaminants, and biochemical oxygen demand to surface and ground waters.

Small farms that dominate the horse industry have increasingly less available acreage for manure spreading. Equine facilities are seeking new options for manure disposal. One of these options is centralized processing which would remove manure from farms where there is inadequate land for spreading and treat it in locations that pose fewer water quality risks while producing valuable end products such as compost. This project addressed the feasibility of applying anaerobic digestion as a step in centralized horse waste processing to increase the value of horse manure through production of a biofuel (methane). Much of the horse waste generated and recoverable in New Jersey is stall waste that is intermingled with softwood bedding. Because wood contains resin compounds with known toxic properties, it is possible that methanogenesis could be inhibited by the wood bedding intermingled with the horse manure. The objectives of this project were to determine if equine stall waste from horses bedded on softwood chips was amenable to anaerobic digestion and to determine if intermingled wood bedding had a negative effect on the conversion to methane.



Anaerobic digesters operated in semi-continuous flow and batch mode were established with horse manure or horse manure plus softwood (pine chip) stall bedding as a feedstock. Initial results indicated that switching the digester feedstock from horse manure alone to horse manure mixed with softwood bedding resulted in inhibition of methane production in semi-continuous laboratory-scale digesters that had been pre-acclimated on horse manure alone. Fennell and her students examined batch methane production potential of horse manure alone and horse manure combined with fresh softwood bedding to examine further the potential for inhibition of methanogenesis by the presence of the bedding. Batch reactor experiments were run at softwood bedding to manure ratios of 0.05 to 4 g softwood volatile solids to horse manure volatile solids. Methane production was monitored following inoculation with a methanogenic community and incubation for up to 60 days at 35°C. Batch reactors amended with fresh (unused) softwood bedding plus horse manure showed no inhibition of methanogenesis relative to controls receiving horse manure alone at any loading. Ongoing work is examining the effect of aged bedding and comparing microbial community profiles between batch reactors exposed to wood and those not exposed to wood to determine whether acclimation is important in digestion of horse waste mixed with soft wood.

Initial experiments in continuous-flow reactors indicated that there may be some inhibition of methane production when softwood bedding is mixed with horse manure in stall waste; however, subsequent batch experiments did not show any inhibition by mixing in fresh, unused softwood bedding, regardless of the relative amount added. The methane content of the biogas was also relatively uniform regardless of the relative amount of wood added. These results suggest that the presence of fresh softwood chips in mixed horse stall waste should not cause inhibition to an acclimated anaerobic digestion process; however, the results should be applied cautiously. Fennell and colleagues are continuing this research by examining the effect of used bedding, and the acclimation aspects at a microbial community level. The softwood chips could also cause mechanical clogging of digesters where piping or pumping is utilized.

# Effects of Bedding Type on Compost Quality of Equine Stall Waste: Implications for Small Farms

Stephen Komar, Robert Miskewitz, Michael Westendorf, and Carey Williams compared chemical and physical properties of composted equine stall waste from four commonly used bedding materials: wood shavings, pelletized wood materials, long straw, and pelletized straw. Composting resulted in significant reductions in dry matter mass for each of the four bedding materials. Composted long straw had higher concentrations of total nitrogen, nitrate, and ammonia when compared to composted wood shavings.

#### KEY MESSAGE

Composting horse manure and strawbased materials greatly reduces mass volume and thus reduces haulage costs and land application rates. This project demonstrated that composting is a viable option for equine stall waste disposal and greatly reduces overall volume of manure and yields a material beneficial for land application in pasture-based systems. While manure pile temperatures indicated that composting occurred for all bedding materials, only the temperatures in straw materials remained increased long enough to reduce the persistence of pathogens, parasites, and weed seeds and may make spreading of composted equine waste more practical in situations of limited pasture availability.

#### Regional Project: NE-1041: Horses and the Environment

The Center's livestock farm environmental management team leads a U.S. Department of Agriculture project to study the impact of equine management and feeding practices on the environment was approved. The project, "NE-1041: Environmental Impacts of Equine Operations," is a Northeast regional project but includes research and extension faculty from across the country. The project team includes representatives from Alabama, Connecticut, Kentucky, Louisiana, Maryland, Michigan, Minnesota, New Jersey,

<u>KEY MESSAGE</u> The "NE-1041" project assesses current environmental impacts and determines ways to minimize the negative consequences.

North Carolina, Pennsylvania, South Dakota, and Vermont. The goal of this project is to incorporate the best available data on horse management and feeding practices, manure storage and disposal, pasture and cropping management, soil and environmental quality, erosion control, and farm management practices to minimize negative impacts of equine operations on the environment.

Specific objectives of the project are to assess existing data on environmental impacts of equine operations, identify gaps in current knowledge, conduct research when data are lacking or nonexistent, and incorporate existing and newly generated data into a systematic description of nutrient flow in soil, water, and air occurring on horse farms. Estimates will be made of pathogen transports and nitrogen (N)-, phosphorus (P)-, potassium (K)-, and energy (carbon)-loss potentials. In addition to identifying system-wide losses on equine farms, another goal of the project is to assist farmers and agricultural professionals in determining the value of equine management practices and other accepted best management practices.











# EQUINE SCIENCE CENTER



Stakeholder Report July 2011 - June 2012

-OUTREACH-



# **Equine Science Center**

Rutgers, The State University of New Jersey 57 US Highway 1 New Brunswick, NJ 08901

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# Letter from Tiffany Cody, Public Relations Specialist

Objectives for the Equine Science Center's public relations and marketing efforts from July 2011-June 2012 were to 1) increase awareness and raise the profile of the Center as the primary resource for everything equine; 2) seek new opportunities to connect with supporters; and 3) generate financial support through the celebration of the Center's 10th anniversary. The Center developed strategies and tactics to achieve these goals.

In an effort to increase awareness, Center staff produced 23 press releases which resulted in more than 50 published articles and over 150 Google Alerts. Articles appeared in print publications such as the Home News Tribune, The Star Ledger, Equine Chronicle, Horse News, NJ Biz, The New York Times, Asbury Park Press, Allentown Examiner, and many others. Furthermore, Center staff produced four newsletters highlighting research, accomplishments, and recent or upcoming events.

The Equine Science Center also delivered its message of better horse care through research and education through media channels such as broadcast television and the Internet. In broadcast, the Center director, Karyn Malinowski, appeared on News 12 New Jersey and Channel 9 News. With the addition of an official Facebook page (esc.rutgers.edu/fb), the Center is able to share real-time news, updates, events, and photos with its friends. Throughout the same time period, the Center made numerous changes to its website, including the new "Horse Hero" webpage. The website continues to be a popular channel for people to connect with the Center. The site received more than 5.9 million hits and has reached approximately 230,000 new users.

The Equine Science Center hosted and/or attended numerous events from July 2011 – June 2012. Each event provides an opportunity for the Center to meet with its many constituents and further spread its mission. The event calendar for this time frame kicked-off with incredibly successful "For the Love of Horses – Pre-Hambletonian VIP Gala" in early August. In addition to generating financial support for the Center, the event also raised the profile of the Center among key constituents including policy decision-makers, veterinarians, and animal health care professionals.

The annual Stakeholder Meeting took place at a new location in 2011 – Rick's Saddle Shop in Cream Ridge. The event was well attended by representatives from various equine breed and discipline organizations. In December, the Center hosted over 160 engaged guests at the Equine Science Update. The Horse Management Seminar took place on Sunday, February 5 with many attendees eager to learn about "Responsible Horse Ownership in a Tough Economic Climate." Always a favorite with alumni and incoming students, the Equine Science Center's involvement in Ag Field Day at Rutgers Day was a major success. Equine enthusiasts gather 30 minutes in advance of the equine treadmill demonstration start time in order to secure their place in the lab before the guest line is cut-off. The events calendar for this time period ended on a high note with a visit from the New Jersey Secretary of Agriculture, Douglas Fisher, to collaborate with the Center in celebration of June as the "Month of the Horse" in the Garden State. Assemblyman Robert Clifton and Councilwoman Cathy Nicola also attended the kick-off event. With the support of friends like you, the Equine Science

Center achieved many accomplishments in 2011. Thank you for making the Center your primary source for everything equine.

Cheers,

Tiffany J. Cody Public Relations Specialist, Equine Science Center



# Ensuring a Sustainable Future for the Equine Industry

## **Equine Science 4 Kids!**

To address the need for scientific, research-based information about horses and their care and management at a level appropriate for junior high school youth, the Rutgers Equine Science Center developed "Equine Science 4 Kids!" (ES4K), an interactive youth component on the Center's website: esc.rutgers.edu/kids. The goal was to create a dynamic and interactive online classroom featuring an equine mascot to teach youth (ages 10-14 years) about the science of horses. In 2011, the Center added an innovative educational tool, a virtual tour of the equine exercise physiology laboratory and the high-speed treadmill, to "Equine Science 4 Kids!" The virtual tour is an excellent way for youth to learn the science of horses and get a behind-the-scenes look at how research is conducted in an equine laboratory. The virtual tour is now accessible on Equine Science 4 Kids! Horses on a Treadmill?!

## KEY MESSAGE ES4K motivates young equine enthusiasts to learn about the science of horses.





## Horse Racing Industry

Karyn Malinowski, director of the Center, presented "Quantifying the Importance of the Industry", a scientific report on the socio-economic impact of horse racing to the equine industry and traditional agriculture during the opening session of the 22nd World Trotting Conference. The five-day conference, which was held at the Hyatt Regency in Jersey City, commenced on Thursday, August 4.

Delegates and observers representing 16 countries and the European Trotting Union attended the conference which is hosted in the United States approximately once every 15 years. The conference provides a rare opportunity to network and exchange ideas with influential leaders in the harness racing industry from all around the world. Center representatives Ryan Avenatti and Tim Manzi were tasked as scribes for the conference. Avenatti is a Ph.D. candidate in the Department of Animal Sciences and Manzi, now a veterinary student at the University of Pennsylvania, was a College of New Jersey undergraduate student taking research credit hours at Rutgers University.

Malinowski was also asked to lecture at the March 14, 2012 Pennsylvania Horse Conference to inform policy decision makers in the Keystone State about the socio-economic value of horse

#### KEY MESSAGE

The Equine Science Center continues to serve as an advisor to the racing industry and an advocate for unity and cooperation among the various equine breed groups and disciplines.

racing during a contentious time when Governor Rendell proposed to take \$72 million from the horsemen's account for the general fund.

She also used her experience in addressing the importance of horse racing in New Jersey at the National Association of Equine Affiliated Academics conference on June 26, 2012. She served on a discussion panel and presented a lecture titled, "Dealing with Emotionally Charged Issues in the Equine Industry."

#### **Business Planning for Equine Operations**

In 2012, the Center funded a pilot program of Robin Brumfield, Carey Williams, and Laura Gladney. The program is the beginning of a new "Business Planning for Equestrians Initiative." The goal is to maintain the sustainability of the New Jersey equine industry by ensuring that all equine-related business owners have the tools needed to develop or update a written business plan. Business planning can help an operation cope with unforeseen circumstances as well as better analyze markets.



# ACADEMICS

Students interested in pursuing careers in the horse industry or just improving their knowledge of horses can study equine science in the Department of Animal Sciences at the School of Environmental and Biological Sciences (SEBS) at Rutgers. Please use the following website for information: animalsciences.rutgers.edu

Under the auspices of the Animal Industries-Equine Specialization major, students take all of the equine didactic courses available in addition to courses in marketing, basic sciences, and animal science, and also sign up for "hands-on" credits through the Equine Practicum, Research in Animal Science course and/

or Cooperative Education. A minor in Equine Science is also available to students majoring in other disciplines.

Courses tend to emphasize the science of horses—not only "how" as in many other equine curricula, but "why." Students interact closely with their advisors and are given guidance in career decisions.

# **Public Course Offerings**

Many of the SEBS undergraduate courses are open to the general public through the Office of Continuing Professional Education.

#### Courses include:

Advanced Equine Health and Management Developing Future Leaders for the Equine Industry Equine Nutrition Horse Management

## Equine Leadership Course Exceeds Expectations

The Rutgers Equine Science Center held its third installment of the winter short course, "Developing Future Leaders for the Equine Industry" at Ricks Saddle Shop in Cream Ridge, New Jersey on January 10 and 12. The class was attended by 17 individuals, including four "Continuing Professional Education" students with direct ties to the equine industry. The class was led by Karyn Malinowski and Mary Nikola, Director of Leadership and Organizational Development at the New Jersey

#### KEY MESSAGE

Professionals gather to educate students about leadership and organizational skills needed to succeed in the equine industry.

Agricultural Experiment Station. Topics included the value of the equine industry, networking, relationship building, decision-making strategies, leadership practices and behaviors, building

coalitions, and industry management. Subject matter was supplemented by lectures from industry professionals including Rajesh Sinha of Liberty Farm, Sandy Denarski, Vice President of Johnson and Johnson Finance Corporation, Liz Durkin of Durkin and Durkin Law Firm, Al Gaburo of Princeton Public Affairs Group, Jerry Baron, director of the IR-4 program, Thomas Luchento, President, Standardbred Breeders and Owners Association-NJ and Mike Newlin, General Manager of the New Meadowlands Racetrack. According to the course evaluation survey, knowledge about

the New Jersey equine industry and its network increased 105%, with more than half of the students declaring that the course exceeded its objectives. The most recent class organized a reunion event for all course alumni at the New Meadowlands Racetrack on April 24. Over 30 alumni listened to track owner Jeff Gural who hosted the party.





#### Ernest C. Bell Scholarship

This year's Ernest Bell Scholarship was awarded to Dale Levitt of Freehold, NJ. Levitt is a Senior Animal Science student with a pre-vet concentration. He will be attending the University of Pennsylvania veterinary school. His horse experience began at a young age, through working with Special Strides at Congress Hill Farm in Monroe, NJ. During his time at Rutgers, Levitt was heavily involved with the animal farm through work study, research, and a part of the NESA (Northeast Student Affiliate) team.

## Doris C. Murphy Endowed Scholarship in Equine Science

The Doris C. Murphy Endowed Scholarship in Equine Science was created to honor the memory of a woman who loved animals. Shortly before Ms. Murphy's death in 1998, she contacted her financial advisor, Kate Sweeney of Smith Barney, and expressed her desire to support animal studies. Ms. Sweeney, a Cook College alumna, suggested the equine science program as an appropriate beneficiary, and as Ms. Murphy was also very supportive of women's education, the endowed scholarship is offered to female undergraduate students majoring in Animal Sciences with an equine science interest. Students must also be New Jersey residents. Scholarship recipients for 2011-2012 were Alex Broomell, Rebecca Freiday, Melissa Koger, Rachel Walter and Samantha Washington.

# COMMUNITY/INDUSTRY INVOLVEMENT

# Hambletonian Continuing Education Veterinary Conference

Sarah Ralston presented "NMR-based Metabonomic Analyses of Horse Serum: Detection of Metabolic Markers of Disease", at the 12th Annual Hambletonian Continuing Education Veterinary Conference on August 9, 2011 at the Sheraton Meadowlands in East Rutherford. Nuclear Magnetic Resonance (NMR)-based metabonomic studies use multivariate statistical analyses of NMR spectra from biological samples to detect metabolic profiles (metabonomes) associated with diseases, toxins, or genetic variations.

Throughout the day, veterinarians and equine science professionals attend lectures, wet labs, seminars, and visited with vendors at the trade show. In addition to Sarah Ralston, Karyn Malinowski, Carey Williams, Center staff members and several current and former students were present at the conference.



# Record Turn-Out for Annual Equine Science Update

The annual Equine Science Update was held on Tuesday, December 8 at the Cook Campus Center on the G. H. Cook Campus in New Brunswick. More than 160 guests attended the event which provides attendees with current information regarding Equine Science Center research projects and initiatives.

The evening began with a presentation of "Code Red" by Julie Vence, of the Warren County 4-H Horse Program and winner of the 2010 Eastern National 4-H Roundup – Individual Presentation Competition.

Before the scientific portion of the evening commenced, Sandy Denarski, chairwoman of the Rutgers University Board for Equine Advancement, honored Karyn Malinowski by presenting her with the Visionary Award on behalf of the board, faculty, staff, and students of the Equine Science Center. The award recognized Malinowski for having the ability to identify a need for the Equine Science Center and forging a path at Rutgers University for scientific equine study dedicated to better horse care through research and education.

Karyn Malinowski provided guests with an overview of Equine Science Center highlights throughout the course of the past year. Immediately following Malinowski, Sarah Ralston presented, "Metabonomics: the New 'omic' Tool". Graduate students Ryan Avenatti and Danielle Smarsh collaborated to present, "Shocking' New Research on Oxidative Stress and Inflammation". The final presentation of the evening was from Carey Williams. Her presentation, "Love Your Horse, Love the Environment", featured research from a team of colleagues including Michael Westendorf, Chris Obropta, and Steve Komar.

In addition to the scientific research presentations, the Equine Science Center was also presented with a gift of \$1000 from the NJ 4-H Horse Project Advisory Committee.

# Ag Field Day at Rutgers Day

The fully-assembled skeleton model made its public debut on April 28th during Ag Field Day at Rutgers Day. Along with its display, many people were attracted by a naming contest held for the skeleton. The top 10 names were selected at the end of the day and posted on the Equine Science Center's Facebook page to be voted on by the page's 500 "fans". At the completion of the voting period, the name RU Wish Bone was declared the winner with a nearly 100 vote lead. The name was submitted by Marcella M., 12, of Elizabeth, New Jersey. Also featured during Ag Field Day were two demonstrations of a horse running on the treadmill in the equine exercise physiology laboratory. For each demonstration, over 130 guests packed the lab in order to get a glimpse of a horse running near top-speed of 30 miles per hour! In addition to learning about the sound equine science conducted at the Center, visitors to the Red Barn thoroughly enjoyed an opportunity to get temporary tattoos and stickers and other information about the Equine Science Center.



# Jersey Fresh

In early May, several Rutgers undergraduate students and post-graduates attended the Jersey Fresh International Three-Day event at the Horse Park of New Jersey in Allentown, NJ.

The event actually spanned four days, with Thursday, May 10 and Friday, May 11 as the two days of dressage. Cross-country jumping was held on Saturday, with show jumping and the awards ceremony on Sunday.

Leading up to the competition, event organizers and a team of dedicated volunteers spent an entire week on course set-up and design. Event preparation required many hands-on-deck and the perfect opportunity for Rutgers students to get a behind-the-scenes perspective on how an international event of this scale comes together.

The 2012 Jersey Fresh competition was particularly important because it was one of several

selection trials for the London Summer Olympics for the USA's Eventing Team. Many outstanding horses and riders participated in the event, including Phillip Dutton, Karen O'Connor and Boyd Martin.

By volunteering, Rutgers students were presented with a chance to network with event vendors, sponsors, organizers and riders. Monika Abraham and Emily Hulak (pictured) assisted with displaying the Equine Science Center banner near the veterinary box after the cross-country jumps. Fortunately the



weather cooperated and everyone rode safely for a very successful Jersey Fresh.

## FAIR Committee

The Rutgers Equine Science Center, and the equine industry as a whole, was well represented by Karyn Malinowski and Ryan Avenatti, at the Farm Animal Integrated Research (FAIR) 2012 conference, from March 4-6, in Arlington, VA. The purpose of the meeting was to discuss and establish priorities for research, education, and outreach for animal agriculture, with implications for food security, animal health, and responsible environmental stewardship. These priorities are intended to provide direction for federal agricultural research, education, and economic programs

#### **KEY MESSAGE**

Equine and companion animal professionals met to discuss the future of animal agriculture, including research, health, and education.

over the next decade. Conference participants were invited experts from various segments of animal agriculture, including economists, animal scientists, and veterinarians from industry, academia, and government.

2012 marked the first year that equine and companion animal interests were included in the comprehensive discussion concerning the future of animal production in the United States. The

name of the conference itself represents a movement away from the traditional view of production animal agriculture. All previous FAIR conferences were focused on "Food Animal Integrated Research", whereas this year's meeting was entitled "Farm Animal Integrated Research".

The similar visions and priorities of the Equine Science Center and the organizers of FAIR 2012 represent an opportunity to further strengthen the coalition between the equine and production animal segments of the entire animal agriculture industry. Through cooperation and discourse among the various animal agriculture sectors, the challenges and threats facing animal production and husbandry in the United States may be adequately addressed.

# Stakeholder Strategic Planning Meeting

The Equine Science Center's Stakeholder's Meeting on October 19 was a tremendous success as horse owners and farmers, businessmen, breeders, and equine enthusiasts gathered to address issues within the equine industry in New Jersey. The annual event was well attended with more than 40 stakeholders focusing their attention on horse health, integrity of equestrian sport, land use and environmental stewardship, the future of the equine industry and other areas of concern. In 2011, the Center tried a new format and venue for the annual meeting. The Stakeholder's Meeting was held in conjunction with the New Jersey Department of Agriculture's regularly scheduled monthly Equine Advisory Board meeting at Rick's Saddle Shop in Cream Ridge.

The meeting yielded vigorous discussion, which led to attendees identifying several key issues of concern regarding the equine industry. A brief review of those issues includes:

- Request for educational information on mandatory tests & vaccinations
- Center faculty and staff to provide Fact Sheets on animal waste management and environmental stewardship
- Educate equine business owners on tax laws
- Continue to be advocates for the racing industry

For a full list of Key Identified Issues, visit the "Professional" page of the Center's website.

## Horse Management Seminar

The 2012 Horse Management Seminar titled "Responsible Horse Ownership in a Tough Economic Climate" took place on Saturday, February 4 to rave reviews. Topics included Business Planning for Equestrians by Robin Brumfield of Rutgers University; Marketing and Promotion of Horses and Services by William Day of SUNY Morrisville; Reducing Feed Costs by Improving Pastures by Carey Williams of Rutgers University; The Cost of Keeping a Horse by Carissa Wickens of University of Delaware; and Economical Veterinary Care by Michael Fugaro of Centenary College and Mountain Pointe Veterinary.



All of the presentations were ranked between 3.8 and 4.6 (5 being the most valuable), with "information on improving pasture" and "information on economical veterinary care" ranked as the top two. Participants reported significant increases in knowledge after attending the seminar. The knowledge increase was greatest for the concept "the value of budgeting for veterinary emergencies," rated at 4.5 out of 5. Another high-scoring concept was "how to manage your pastures for better forage yield" at 4.3.

# Multi-Media

# Webinar Series

The Center hosted two webinar series during the reporting period. The fall series' theme was chosen in response to Hurricane Irene, "Disaster Preparation and Recovery." The first webinar held on October 26 featured Mary Goepfert, field training instructor and public information officer from the New Jersey Office of Emergency Management, who presented "Resources Available for Assistance after a Disaster Declaration." Agencies like the Federal Emergency Management Agency, Small Business Administration, Farm Service Agency, and even the IRS can help horse farm owners get back on their feet. The second webinar was held on November 9. Shari C. Silverman, VMD, Principal Veterinarian for the New Jersey Department of Agriculture, presented "Emergency Planning and Preparedness for Horse and Farm."

The spring 2012 series focused on "Care and Management of Horses in Tough Economic Times." The first webinar was presented on April 3 by William Day, SUNY Morrisville. Day presented "Horse Promotion and Marketability." The second webinar was presented on April 10 and featured Carolyn Stull, Animal Welfare Specialist, Veterinary Medicine Extension, University of California, who presented "Refeeding the Starved Horse."

All Equine Science Center webinars are archived at esc.rutgers.edu/publications/webinars.htm

# AWARDS

# LeeAnne Pooler Unsung Hero

The United States Harness Writer's Association (USHWA) honored Equine Science Center director, Karyn Malinowski, with the LeeAnne Pooler Unsung Hero Award. The award was presented during the USHWA's annual Dan Patch Awards Dinner held on February 12, in Orlando, Florida.

The Unsung Hero award is given annually to a member of the harness racing community who may otherwise go unrecognized for his or her selfless achievements. Malinowski continually demonstrates her dedication to harness racing by promoting rational and relevant discussion about the current state of the industry and its future in New Jersey and beyond.



# Spirit of the Horse

The Equine Science Center named leading New Jersey attorney Liz Durkin as the 2012 recipient of the Center's "Spirit of the Horse" award. Ms. Durkin received the award during the Equine Science Update on December 8, 2011. The "Spirit of the Horse" award recognizes individuals whose lives have been profoundly changed because of their involvement with horses and who have acknowledged the impact by giving back to the horse industry.



# **BUSINESS OPERATIONS**

# Marketing, Media and Public Relations

Objectives for the Equine Science Center's public relations and marketing efforts from July 2011-June 2012 were to 1) increase awareness and raise the profile of the Center as the primary resource for everything equine; 2) seek new opportunities to connect with supporters; and 3) generate financial support through the celebration of the Center's 10th anniversary. The Center developed strategies and tactics to achieve these goals.

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## Fund-Raising and Development

For the period of 2011-2012, \$276,627 was procured by faculty and staff in cash gifts, donations, and income from miscellaneous sources such as registration at events.

The Center is taking commitment to new heights and has initiated an ambitious \$6.5 million campaign to expand faculty, research capabilities, programming, and outreach. Friends and supporters are invited to visit the Equine Science Center to learn about the pivotal role a meaningful gift can play in training new generations of knowledgeable, passionate equine advocates, and specialists.



# Standardbred Breeders and Owners Association -New Jersey Hosts Center VIP Gala

On Thursday, August 4, 2011, Brian Cashman, General Manager and Senior Vice President of the New York Yankees, delivered the keynote address during "For the Love of Horses - A Pre-Hambletonian Celebration", a gala held in honor of the Rutgers Equine Science Center's 10th anniversary at the Commissioners Club in the New Meadowlands Stadium. The event was hosted by the Standardbred Breeders and Owners Association – New Jersey. The invitation-only event was an opportunity to celebrate a decade of achievements and accomplishments by the Equine Science Center and to raise awareness of its need for future support.

The event was sponsored by corporate and private donors including Sandy Denarski, Hanover Shoe Farms, Showplace Farms, Pfizer Animal Health, and over a dozen additional supporters.

# New Jersey State 4-H Horse Show Benefits the Equine Science Center

The 2011 New Jersey State 4-H Championship Horse Show included a division in its prize list: the Equine Science Center Benefit Fun Show. Intended to recognize the Center for its contributions to the equine industry, the show featured classes and games sponsored by participating 4-H counties. The show, which was held at the Horse Park of New Jersey from September 9-11, raised \$500.00 for the Center.

## Horse Heroes

In late September 2011, the Equine Science Center launched "Horse Heroes," a new initiative offering sponsorships for the horses in its research herd. The goal of the "Horse Heroes" program is to raise funds to purchase grain, hay, bedding, and veterinary care for the herd, which is comprised of 23 mares.

Each of the "Horse Hero girls" has a profile containing vital information such as age, sire and dam names, tattoo number and original home, as well as information about her role and involvement in teaching and research at the Equine Science Center. Horse Hero profiles are available from the Center's homepage: esc.rutgers.edu.

Thanks to generous donations from friends and supporters of the Equine Science Center, four Horse Hero mares were sponsored during 2011 – 2012: Frankie, Jackie, June, and Winnie.

The Center extends its heartfelt appreciation to its Horse Hero sponsors - Jeanine McKay (Frankie); Autumn Ridge, New Jersey Region, and Somerset Hills Pony Clubs (Jackie); Pat Colbert and Kate Steenberg (June); and the Gloucester County 4-H Equine Science Club (Winnie).

## Center Teams up with New Jersey 4-H Horse Project Members

In 2012, the Center teamed-up with New Jersey 4-H youth members to create a new set of correspondence cards featuring artwork submitted for competition in the annual 4-H Equine Art Contest. The colorful and creative cards are currently in rotation and serve as the official stationary of the Equine Science Center.

With the help of Carol Ward, Rutgers Cooperative Extension County

4-H Agent, and Lillian Shupe, managing editor of Horse News, the Center reviewed almost 30 pieces of art entered into the contest. Six pieces of art were selected by the Equine Science Center staff for use by the Center. Artists chosen were: Maya Lundquist, Burlington County, Heather Koering, Cumberland

County, Christina Czajkowski, Catherine Tistan, and Cecilia Floyd of Gloucester County, and Moira Krier, Ocean County.

In addition to using the 4-H designed cards as stationary, a full set of the six cards and envelopes are mailed as a thank you item to donors making a gift of \$100 or more to the Center.







## Women of Influence

Beginning in the fall of 2009, the Center began hosting intimate dinner parties with "Women of Influence" who are members of the "Community of '50' for Equine Excellence. The purpose is to engage influential women in the horse industry in networking opportunities and to discuss issues of importance to the Equine Science Center and the horse industry. On October 24 RUBEA member Liz Durkin hosted a WOI dinner party at the home of her parents Betty and Tom.



# Reaching Out to Alumni

In 2012, the Center began a new outreach campaign under the leadership of Laura Gladney, targeting alumni of the Equine Science program as well as any Rutgers alumnus who has an interest in horses. Alumni were contacted through e-mail and Facebook with the option to sign up for the Engaged Alumni List. These "Engaged Alumni" will be sent special invitations to Center events with admission discounts and featured in the "Alumni Voices" section of the Equine Science Center newsletter. The initiative will also allow non-local alumni to keep in touch via Facebook updates, webinars, and website updates! If you'd like to catch up, send your name, e-mail address and/or mailing address to gladney@aesop.rutgers.edu to reconnect and join the Equine Science Center alumni network.



# The Role of Horses in Human Medicine

Ken McKeever, provided a lecture on "The Role of Horses in Human Medicine" at the November meeting of the Philadelphia Society for Promoting Agriculture. The meeting was held at the historic Union League of Philadelphia. During his lecture, McKeever acknowledged a host of scientists whose pioneering research and discovery into medicine was conducted with horses serving as an animal model similar for humans. He also discussed why horses are an excellent study for human conditions, and how the Equine Science Center established its treadmill laboratory.

# Month of the Horse

The Center kicked off the "Month of the Horse" on June 1 by hosting Secretary of Agriculture Doug Fisher and Assemblyman Robert Clifton at the Equine Exercise Physiology Laboratory.



# - End of Outreach Section -Turn Book Over for Research