

# RUTGERS

New Jersey Agricultural  
Experiment Station

Rutgers Equine  
Science Center

Stakeholder Report  
January 1, 2008 – June 30, 2009



## **Highlights – Equine Science Center January 1, 2008 – June 30, 2009**

In January 2009, the Rutgers Equine Science Center completed a Comparative Analysis of equine-related centers to more fully understand and define the unique position and characteristics of the Center in the context of other equine programs across the United States. Components of other universities and appropriate private organizations were examined.

Faculty and staff productivity for the period was high, resulting in 40 refereed journal articles; 27 refereed abstracts; 9 book chapters; 31 Extension publications, DVDs and podcasts; and 27 invited talks and presentations. Outside grants and contracts totaled over \$800,000. Three new members joined the elite group, “*The Community of Fifty for Equine Excellence*,” which is an annual pledge of \$10,000 for a six year period. Other donations and gifts totaled \$313,241, of which Horses 2009 was responsible for \$92,000 through registrations and sponsorships. The Center continues to receive gifts from veterinarians who make a contribution in memory of a horse which has been euthanized by their practice.

Fundraising efforts led to a quasi-endowment at the Rutgers University Foundation, with the focus of reaching the goal of \$3 million. The newly formed “Friends of the Rutgers Equine Science Center Club,” chaired by Dr. Cathy Ball, aims to unite alumni and raise outside interest and awareness in the Center.

Progress continued at the Ryders Lane Environmental Best Management Practices Horse Farm. Soil testing is ongoing, with fertilization plans implemented according to test results. Three storm water treatment methods were established for maintenance of water quality. Manure storage pads, approved by the Natural Resource Conservation Service (NRCS), were built for manure management. On-farm demonstrations, short-courses and downloadable fact sheets continue to help stakeholders learn about the Best Management Practices being implemented at the farm.

The Young Horse Teaching & Research Program continues to be strong and popular, despite a financial shortfall compared to earlier years. Research information on best practices for feeding young warmblood and draft cross horses is ongoing, along with studies of transportation stress in young horses. The program will take a new direction for 2009-10, by incorporating yearling mustangs from the Bureau of Land Management into the program.

Horses 2009 was a colossal success. The event took place at the Busch Campus Center on March 28-29, 2009. Over 700 people attended, and virtually all stated that they would use what was learned at Horses 2009 to change and improve their own activities and procedures. The number of attendees more than doubled that of Horses 2003 and Horses 2007.

Research at the Equine Science Center is ongoing, and on the cutting-edge. Funded projects for the period included:

- Effects of Age and Training on the Cytokine, Myokine, and Endocrine Regulation of Glucose Metabolism;
- How Specific Gut-Derived Bacteria Could Influence Development of Laminitis;
- Horse Manure to Bio-energy for On-Farm or Regional Application;
- 4-H Youth Development Horse Programs;
- On-Farm Best Management Environmental Practices for Horses;
- Influence of Diet and Bedding Characteristics on Manure Excretion, Manure Characteristics and Air Quality;
- Agri-environmental Assessment of Equine Pastures and Trails in the Colts Neck Watershed;
- Assessing the Impact of Horse Manure and Composted Manure on Soil and Water Quality.

Equine academics are advancing. Courses emphasize the science of horses, with 30-60 undergraduate students involved in equine research each semester. Rutgers has a Memorandum of Understanding with the University of Delaware, Penn State University, Delaware Valley, and Centenary College, wherein our students can take a semester of “how to” classes on topics such as equine breeding management, horse training and conditioning, horse show management, therapeutic riding instruction, and stable management, to name a few. In 2008 the Equine Science Center offered two new courses which focus on horse health and horse industry leadership.

The Doris C. Murphy Scholarships were awarded to five female members of the Class of 2010 who are studying Animal Science, with an equine emphasis. Tiffany Morey, a senior at Rutgers’ School of Environmental and Biological Sciences (SEBS), was the recipient of the Ernest C. Bell Scholarship for 2009. Additionally, in 2008 and 2009, Ms. Patty Hogan and Mr. Rick Wills received the Center’s “Spirit of the Horse” Award, respectively.

The Center’s website underwent a major expansion, and its recent marketing campaign included a series of “Advertorials,” press releases, open houses and newsletters. Podcasts were the latest addition to the menu of delivery modes offered to constituents who want information about horse care and farm management.

The Equine Science Center added new faculty, staff, and graduate students. Faculty and staff continued to assist in the preservation of the racing industry and is an advocate for unity and cooperation among the various equine breed groups.

In October 2008, the Stakeholders Meeting reiterated the industry’s need for research in the areas of horse health, land management, integrity of equestrian sport, environmental stewardship and the development of future leaders.

The faculty, staff and students at the Equine Science Center have won several prestigious awards, including the 2007 Award of Excellence from the Northeast Cooperative Extension Directors for the study, *New Jersey Equine Industry 2007: Economic Impact*.

At the 2009 Equine Science Society Meeting (ESS), Carey Williams received the outstanding Young Professional award; Kenneth McKeever was elected to its board of directors. Sarah Ralston completed her term as a board member. Nettie Liburt placed first in the graduate student competition (reproduction/endocrinology section) and Emily Lamprecht placed second in the exercise physiology section.

Katharine Zeigler and Emily Lamprecht won the Undergraduate and Graduate first place awards, respectively, for their presentations of research posters at the Mid-Atlantic Nutrition Conference in Timonium, Maryland.

Rutgers University Board for Equine Advancement underwent reorganization and revised its mission and vision.

During the report period, 41 events were held in which Center activities were a primary or major focus.

## **Report on Major Programs**

### **Comparative Analysis**

In New Jersey, where the horse is the state animal, the equine industry is invaluable as a major factor for improving the quality of life for New Jersey residents by preserving open space, providing outdoor sport and recreation, building a solid foundation for youth development, and providing mental and physical therapy to adjudicated youth and handicapped persons.

The New Jersey equine industry, valued at \$4 billion, produces an annual positive economic impact of \$1.1 billion, employs approximately 13,000 persons and generates \$160 million in tax revenue. Horses are found on 7,200 facilities on 176,000 acres in every county statewide.

In 1978, visionaries at Rutgers University, with stakeholder input and support, saw that horses were the future of the livestock and agricultural industries in New Jersey. The group formed an advisory committee now known as the Rutgers University Board for Equine Advancement, and established a formal equine sciences program within the Department of Animal Sciences at Cook College (now known as the School of Environmental and Biological Sciences). The move proved to be remarkably prescient, as today the equine industry in New Jersey has become a dominant force in agriculture and a key component in open space and farmland preservation in the state.

The New Jersey Agricultural Experiment Station was one of the first land-grant institutions to recognize the importance of horses and the equine industry to the socio-economic health of the state. The Equine Science Center currently leads the nation in fulfilling the land-grant mission of integrating programs of instruction, research and extension in agriculture, food and environmental systems, reaching across university affiliations and academic departments worldwide to put together the best and brightest experts to examine almost any issue or challenge facing the well-being of horses or the horse industry. The Center has garnered such regional and national exposure that it influenced federal policy to list horses and the equine industry in the 2008 extension priorities of USDA/Cooperative State Research, Education and Extension Service.

In 2001, Rutgers University's Board of Governors recognized the excellent science, teaching and extension components of the equine studies program by declaring the Rutgers Equine Science Center an official institute of the university whose mission is "better horse care through research and education in order to advance the well-being and performance of horses and the equine industry."

The Center became a hub of discovery, learning, and influence whose sole focus and concentration is the horse. The Equine Science Center is a soft-walled center, not one of bricks and mortar with a single building or facility used for a sole purpose or activity. The Center's team of faculty, students and staff works in multi-disciplinary and multi-state fashion, as well as with local horse farms to accomplish its mission.

In fulfilling the land-grant mission, the Equine Science Center is an influential place, where cutting-edge discovery is carried out by scientists and students and is translated into language that real people, such as policy decision-makers and horse owners and horse farm operators, can understand and use. The Center is the entity responsible for delivering useful, science-based information to people around the world through its robust website which disseminates news; posts podcasts, numerous fact sheets and bulletins; and hosts the details of Center conferences, such as Horses 2009.

Because of its concentration of the health and wellness of the equine athlete and the equine industry, the Equine Science Center occupies a unique niche nationally and internationally. For example, even though the Center works closely with veterinarians and other professionals in the industry and boasts a significant roster of veterinarian alumni; the Center is not a veterinary school or veterinary clinic or research facility. Work done in connection with the equine athlete by the Center is designed to prevent illness and injury, not to repair damage once it occurs. Similarly, with its policy work, the Center has been extremely successful in helping the industry identify its weaknesses and strengths in order to find solutions to ensure sustainability.

While the Center has established itself very prominently within the state, regionally, nationally and even internationally, its leadership continues to look for a “competitive edge” when developing its future vision and business plans, hence the need for the comparative analysis contained in this document.

The Center commissioned a comparative analysis of equine-related centers to more fully understand and define the unique position and characteristics of the Rutgers Equine Science Center in the context of other equine programs across the U.S. The Center thanks graduate student and doctoral candidate Nettie Liburt for her comprehensive search of websites and materials in preparation of this document and Diana Orban Brown, formerly director of communications with the Rutgers Equine Science Center, for her design and direction of this project. See Appendix A for the comparative analysis executive summary.

## **Ryders Lane Environmental Best Management Practices Farm**

### **Background**

The goal of this project was to create a research and educational venue at one of the equine research facilities of the Rutgers New Jersey Agriculture Experiment Station, under the auspices of the Equine Science Center. The overall goal was to showcase best management practices (BMPs) for equine and other animal facilities. This goal was met by accomplishing the following objectives: 1) implementation of stormwater BMPs that minimize water quality impacts and evaluating the efficacy of these practices, 2) establishment of pasture management strategies that are protective of the environment while maximizing forage quality and availability, 3) creating an effective manure management system to minimize the environmental impacts of animal waste, and 4) conducting educational demonstrations and workshops showcasing the BMPs for stakeholders.

The project was funded by the New Jersey Agricultural Experiment Station's State Equine Initiative, New Jersey Department of Agriculture, Natural Resource Conservation Service (NRCS), New Jersey Department of Environmental Protection and the Environmental Protection Agency for a total of \$425,000, strong evidence that this project addressed environmental issues important to our stakeholders in New Jersey.

### **Progress to Date**

#### **Pasture Management**

Five fields of the 40-acre farm were soil tested and continue to be tested on a three year basis. A fertilization and liming plan was developed based on the soil test recommendations. Weeds in all the fields were identified and a mowing and herbicide-spraying plan was implemented and is updated on a yearly basis. Three of the five fields have been completely renovated or over-seeded. One of those fields includes plots of eleven varieties of grass species to use as a teaching demonstration area and possible research site. A new fence layout for a rotational grazing system with sacrifice lots has been implanted with a new perimeter fence that uses Diamond-Mesh wire and a top rail with an electric wire. A variety of temporary types of fencing are being used as demonstrations in the rotational system.

#### **Water Quality**

Storm water designs for three types of BMPs were selected for implementation at the Ryders Lane facility: 1) a bioswale to treat agricultural/pasture/road water runoff, 2) a dry well/infiltration trench to treat roof runoff from the barn, and 3) a bioretention basin to treat agricultural and pasture runoff. Additionally, riparian buffers were designed for controlling and treating stormwater runoff from the agricultural fields and manure storage pads that are associated with the site.

## **Manure Management**

A Comprehensive Nutrient Management Plan was completed in 2008 for the entire Rutgers University farm, including equine, dairy, pig, sheep and goat manure production. This has been approved by the NRCS and is being strictly followed. The satellite manure storage pads, designed with the help of NRCS, have been constructed. They include a vegetative buffer to decrease the amount of nutrient runoff from these pads. Plans for a windrow composting site are underway and in the process of being finalized.

## **Educational Programs**

Educational programs were centered on the newly constructed BMPs that are of particular interest to small farm owners. On-farm demonstrations allow interested stakeholders to see a wide range of developed BMPs first hand and to talk with the people who designed, constructed and maintained these BMPs. This is an invaluable resource especially for the large number of novice farm owners so common in our state. Horse owners and other farmers were and will continue to be invited to the facility for twilight and workshops/seminars to learn how to identify areas of concern at their facilities and select BMPs that can be constructed to address these concerns.

Several short courses and seminars were hosted by the Center with “The Farm and Land Management Short Course” being the most popular. These were held not only on campus but also at off campus locations in collaboration with county extension agents. These courses encompassed all the BMPs utilized during this project and allowed farmers to see the initial problems, progress of improvements, and the completed projects.

Several fact sheets have been published to disseminate the data generated by this project. They have been posted on two Rutgers websites ([www.esc.rutgers.edu](http://www.esc.rutgers.edu) and [www.njaes.rutgers.edu](http://www.njaes.rutgers.edu)). The team also developed a newsletter that details not only the progress of the project and but also timely topics related to stormwater, manure, and pasture management. The Center website ([www.esc.rutgers.edu/rlp/rlpmain.htm](http://www.esc.rutgers.edu/rlp/rlpmain.htm)) also has a section developed to document the projects that have been completed with text and photos explaining the BMPs used.

## **Young Horse Teaching and Research Program**

In the mid-1990’s, Sarah Ralston was a member of a consultants’ group advising Wyeth on better management practices for the controversial pregnant mare urine (PMU) industry. Through this association Ralston created a program in which she could combine her research interests in transportation stress and young horse nutrition with her Equine Science teaching program at Rutgers University. Through this program, Ralston has been able to debunk some of the myths and erroneous information about the PMU industry and provide valuable information on the nutrition and management of draft cross horses.

Each August for the past 10 years, Ralston and her students traveled to North Dakota (and, since 2004, Canada) to select 12 foals from PMU farms. After weaning in



September, the foals were transported to Rutgers University. The previously unhandled weanlings were halter trained and gentled by the students for the first 10 to 14 days after arrival. The young horses were then used in nutrition and growth studies as well as the Rutgers teaching program from September to April. In April the yearlings were shown “in hand” in the Annual Rutgers/Ag Field Day Horse Show, then sold the next day at a private auction. Proceeds from the auction support the costs of the program for the following year.

The program involves and benefits many different groups, including:

- **The Equine Industry** - the research conducted by the program has provided interesting information on best practices for feeding young warmblood and draft cross horses. The weanlings’ recovery from the stress of the 36+ hour drive to New Jersey has been the subject of at least 4 student honors theses. The research also provides insight into herd dynamics, stress management during long-distance travel, vitamin supplementation to reduce illness from transportation stress and equine behavior.
- **The PMU Industry** - at the end of each year the program sells the well-handled, well-behaved, and generally good quality yearlings, all of whom have gone on to successful lives as both highly competitive performance horses, and pleasure horses. The program, auction, and the horses themselves, all serve to increase awareness of the quality of the draft and warm-blood crosses being produced by the PMU farms.
- **The Students** - each summer 6-9 students accompany Dr. Ralston to the ranches in North Dakota and Canada to select the foals for that year’s program. For those students, the trip serves as a once in a lifetime opportunity to view first-hand how the farms operate, herd-dynamics and horse behavior, and an entirely different part of the country.

In 2009, the Ag Field Day Horse Show went off smoothly despite quarantine restrictions at the swine facility and larger than usual crowds. The horses looked fabulous and were, for the most part, well-behaved. However, the 10th Annual Young Horse auction brought in only \$11,400 for 10 horses with a total income of \$11,671. Despite several pledges of sponsorships (at \$2000 each), the current budget for the program is \$30,000 below its usual income for the upcoming year. However, new directions and potential sources of income will allow the program to continue, with several new developments which will be shared in the next report.

### **Horses 2009**

One of the most successful accomplishments this year was the Horses 2009 educational conference, which attracted approximately 800 attendees, partners, sponsors and speakers. This event took place March 28-29, 2009. The event was organized entirely by the Rutgers Equine Science Center, with input and participation by Cornell University,

the University of Delaware, the University of Maryland, the University of Vermont, Centenary College, and Delaware Valley College.

### **Event Summary**

Horses 2009 was a two-day educational conference. There was a varied mix of individuals throughout the event: horse owners, horse farm owners and managers, veterinarians, educators, key horse industry people as well as those involved in the racing business. Our audience members were mostly from the New Jersey, New York and Pennsylvania areas. The conference did, however, draw individuals from Delaware and even as far as Illinois and Montana. Veterinarians and vet techs who attended both days of the conference earned eleven hours of Continuing Education credits. The curriculum emphasized topics such as horse health, nutrition, behavior, and subjects related to good horse-keeping.

The first day of Horses 2009 featured Scott Palmer, a well-regarded and prominent veterinarian, who is recognized nationally as an advocate for thoughtful, responsible horse care and ownership. Eric Scott, a veteran broadcast journalist who manages New Jersey's largest radio news staff for Millennium Radio New Jersey and 101.5 FM was the featured speaker on day two. Both speakers were captivating and dynamic and received rave reviews from the attendees. In addition to the educational presentations, twenty-five partners and sponsors were invited to participate at various funding levels. They bought their displays, materials and literature to the conference and were given ample opportunities each day to interact with hundreds of attendees.

At the outset of the planning by a team of internal faculty and staff, attendance goals were 300 persons on day one and 200 on day two. If the goals were met, it would double the number of attendees at Horses 2003 and Horses 2007. To achieve the goal, the team launched an aggressive marketing campaign that including a public relations campaign, advertorials in equine publications, a series of newsletters, a dedicated area on the Equine Science Center website, direct mailings of a colorful registration brochure, selected email blasts, displays of the registration brochure in veterinarians' offices and at equine-related retail outlets, and presentations before a number of interested groups.

Marketing efforts, combined with an outstanding program, resulted in attendance well over 400 on day one, and in excess of 300 people on day two.

Even in a tough economy, Horses 2009 was a financial success. The Center generated \$92,000 in revenue from all sources, including sponsorships, registrations and a silent auction. The profits will be utilized to support Equine Science Center programs. In addition to the financial success of this conference, Horses 2009 tremendously increased the public's awareness of the Equine Science Center and the programs offered.

Results from program evaluations were outstanding. In every aspect of the evaluations, the overwhelming majority of respondents gave the program, speakers and overall content a good to excellent rating. Out of a possible four points, the program received a

ranking of 3.7. Virtually all respondents (99 percent) said they would use the knowledge they learned at Horses 2009 to change and improve their own activities and procedures.

## **Equine Science Center Research**

The mission of the Equine Science Center is to ensure the well-being of horses and the health of the horse industry. Center programs employ the teaching, research, and outreach directives required by the land-grant status of Rutgers, The State University of New Jersey. Work is done by multi-disciplinary, interdisciplinary and inter-institutional teams of faculty and staff.

Through surveys and focus groups with stakeholders, the Center has re-affirmed the horse industry's needs, including the following categories:

- Horse health and well-being
- Right to farm, farm viability and land use
- Integrity of equestrian sport
- Environmental stewardship
- Sustainability of the horse industry and development of future leaders

Work in these core areas is accomplished in a variety of ways and via a variety of funding sources. Faculty and staff affiliated with the Center are involved in ongoing work designed to 1) ensure the integrity of equestrian sport; 2) investigate the beneficial properties of natural food products and nutritional supplements; 3) determine the impact of feeding regimens on orthopedic disease in rapidly growing horses; 4) elucidate how the exercising horse “works”; 5) prevent transportation stress; and 6) care for and manage aging horses.

Funding in support of the Center comes directly from the State of New Jersey through the New Jersey Agricultural Experiment Station's “strategic initiatives” line item. The Center's State Equine Initiative (SEI) funds are awarded on a competitive basis each year by a committee convened by the Equine Science Center. Particular attention is placed on the scope of the project proposed, its relevance to and foreseeable impact on the horse industry (the “so what” factor), the proposer's ability to leverage funds, the multidisciplinary nature of the projects, and numerous other criteria. A complete list of funded projects for fiscal years 2008 and 2009 are in the Appendix section of this report.

### **Horse Health Projects**

■ For the past three years, the Center funded work by recent Ph.D. graduate Emily Lamprecht in the development of an equine exercise model to study inflammation in the horse. Lamprecht's work, in Carey Williams' lab, also studied the effects of a common antioxidant to determine its anti-inflammatory effects.

Both exercise and inflammatory processes have been shown to induce oxidative stress, which if left unresolved can result in chronic degenerative disorders. Superoxide dismutase (SOD) is an antioxidant enzyme that catalyzes the dismutation of superoxide anions into oxygen and hydrogen peroxide, preventing the formation of hydroxyl and peroxynitrite radicals. Supplementation of SOD in other species has been shown to be beneficial in reducing oxidative stress and inflammation, however data from equine trials were needed. Objectives of this study were to evaluate effects of intense exercise and oral SOD supplementation on erythrocyte SOD activity and inflammatory cytokine responses in horses.

Results suggested that a single bout of intense exhaustive exercise did elicit oxidative stress and inflammatory responses in horses indicated by significant up-regulation of antioxidant enzyme (SOD) activity and transcription of both pro- and anti-inflammatory cytokines following exercise. Despite reports of beneficial effects of oral SOD supplementation in other species, it was not found to have any effect on endogenous SOD or cytokine responses in horses for the present study. The take home message for horse owners is that one cannot assume that a supplement that is efficacious in other species would also work for horses. Research needs to be done in horses before company efficacy claims can be made.

■ Current treatment modalities for treating laminitis in horses have recently been reviewed by Moyer, 2008 and by Moore, 2008. These veterinarians concluded it is desirable to continue research in order to understand why laminitis develops and how to either prevent it or improve the treatment of the affected animals. Laminitis affects 10-17% of horses in the equine operations in the United States and 2% of resident horses (USDA, 2000). The suffering endured by horses and the emotional and financial toll on owners remains an area of horse health where it is desirable to improve methods of prevention, treatment and diagnosis.

In 2008-2009 the Center funded a pilot study to investigate the possibility that specific-gut derived microbes disseminate from the GI tract, persist in certain tissue and thereby contribute towards the development of laminitis in the horse.

Accomplishments are as follows:

- A research group was assembled and consists of Michael Fennell, Director of Animal Care on Cook Campus; Michael Fugaro, Associate Professor of Equine Studies, Centenary College and the PI, Janet Onishi, Visiting Scientist, Rutgers University.
- An animal protocol was approved by the University's Animal Care and Use Committee in February, 2009, a facility established, and protocols developed to collect tissue using sterile necropsy methods. Animals utilized had previously been identified by and destined for euthanasia by their attending veterinarians. Two necropsies have been completed and the culture status is typical of non-infected control animals.

- Methods development to improve the extraction of DNA from tissue samples is in progress. The method is needed to accurately quantify and profile the microbial DNA in equine tissues.

If the results of the study indicate the presence of a persistent infection in the chronically laminitic horse, the investigators propose initiating studies to define the metabolic state of the microbes. This information will be important to understand why current antimicrobial strategies and other therapies have failed to improve the outcome for the chronically laminitic horse.

■ Sarah Ralston's lab has been studying feeding protocols for the young, rapidly growing horse for many years. The National Research Council (NRC) recommends that weanling horses be fed rations comprised of 70% grain mix concentrates. Grain-based concentrates fed in distinct meals with or without concurrent hay access result in significant increases in plasma glucose and insulin. High intakes of grain based concentrates have been reported to cause insulin resistance (IR) in weanlings relative to those fed lower starch, higher fat/fiber rations. Increased insulin resistance (IR) has been correlated with an increased incidence in growth related problems such as osteochondrosis, epiphysitis and flexure deformities. However, weanlings fed ad libitum forage based total mixed rations (TMR) with only 30% grain had higher growth rates and feed efficiency than those fed rations in which grain based concentrates were meal fed to provide 50% of the total calories with good quality grass/alfalfa mix hay.

It was hypothesized that forage based TMR cubes could be formulated to meet or exceed all nutrient recommendations for growth in draft cross weanlings without inclusion of grain concentrates and that weanlings fed the TMR ration free choice would have growth rates and feed efficiency comparable to those fed traditional long stem hay/grain rations.

The two groups of horses had growth rates at or above NRC predictions. The draft cross weanlings on the TMR consumed 85% of recommended calories for 0.8kg gain/day but sustained growth rates 90-143% of the predicted value. The traditionally fed group was not different from the predicted values. In previous studies, draft crosses on a variety of rations consistently consumed fewer calories than recommended in the 1989 NRC while sustaining growth rates at or above predicted level. The predictive equations in the new NRC may be more accurate for the draft crosses than those used in the older version, but still may overestimate needs of warmblood/draft cross horses fed TMR rations. There were no feed related problems in the horses fed both rations and none of the horses developed significant growth related problems despite higher than predicted growth rates. Feeding ad libitum TMR cubes formulated for growth without added grain concentrate is a viable alternative to traditional hay/high concentrate rations under the conditions of this trial. This type of ration may be especially appropriate for young horses that are known to be predisposed to insulin resistance and EFD.

■ Ralston has teamed up with colleagues from Princeton University and Hanover Shoe Farms to begin an exciting new study.

Metabonomic analyses use multivariate statistical cluster analyses of Nuclear Magnetic Resonance (NMR) spectra from biological samples to find metabolic markers associated with diseases. The detection of significant differences in large numbers of metabolites from diseased and normal individuals can lead to the development of novel diagnostic and therapeutic modalities based on deeper understanding of the metabolic processes involved. Osteochondrosis dessicans (OCD) is a developmental orthopedic disease that has been well documented to have a genetic basis in Standardbreds and other breeds but the actual metabolic defects causing the lesions have not been well defined. The presence of OCD lesions has been correlated with abnormal insulin sensitivity in young horses but never proven to be a true causal factor.

The overall objective was to determine if metabonomic analyses of NMR spectra of serum samples of yearling horses would detect consistent metabolic differences between yearlings that had hock OCD versus closely related yearling raised in the same environment that did not have hock lesions.

NMR-based metabonomic analysis was able to detect significance differences in protein and perhaps glucose metabolism in yearling horses that developed OCD lesions versus half siblings that did not develop lesions, despite having identical nutritional and environmental histories. Based on these results, it appears that a characteristic metabolic “profile” may be established for young horses that develop OCD. The profile could be used to detect foals “at risk” before lesions appear and hopefully identify the defective metabolic pathways. Once this is accomplished therapeutic modalities may be explored to prevent lesions in foals at risk.

■ The Center resumed its work in the area of aging in horses in 2008-2009 due to the efforts of Ph.D. candidate Nettie Liburt working in Ken McKeever’s lab. Previous work funded by the Center documented aging-induced changes in endocrine function with a suppression of the cortisol and vasopressin responses to exercise as well as a disruption of the glucose and insulin response following exercise in Standardbred mares. The present study used a series of endocrine stimulation tests to examine the hypothesis that the age-induced alteration in cortisol concentration is due to differences in the response of the hypothalamic-pituitary-adrenal axis (HPAA) in old horses compared to younger horses.

Both groups of horses responded to the endocrine stimulation tests in a normal fashion suggesting that feedback mechanism is intact in both old and young horses. The lack of a response to the ACTH stimulation test in old horses suggests that aging disrupts the control of cortisol production and secretion at the level of the adrenal. Further testing is currently underway to study the mechanism by which the older horse’s stress response is blunted during exercise. This is important because cortisol impacts the mobilization of energy for use during exercise. Knowledge gained will help the Center further craft its message on recommendations for the care of older horses during exercise.

## Land Management and Related Projects

While not possible to fund studies and programs that address all areas of concern identified by stakeholders, in recent years the critical need for the public to understand its role in environmental stewardship has dominated some of the grants. This year was no exception, as three projects and programs successfully obtained new or renewed funding. These included the following:

- The Center funded an environmental study in the Colts Neck watershed for the past three years. This project was led by PI Bill Sciarappa.

The purpose of the Colts Neck Project was to assess how equine operations affect the water quality and quantity of the upper portion of the Navesink Watershed. After initial assessment, recommendations will be made on how equine farms and trails can be better managed to reduce any negative impacts on the surrounding water bodies.

Assessment strategies included:

1. Regular monitoring of streams inside the study area as well as a large drinking water reservoir located at the bottom portion of the watershed. Monitoring is done regularly at eight sites to test for common causes of stream impairments such as bacteria (e. coli and fecal streptococcus), temperature, pH, TDS, nitrates, phosphates, conductivity, ammonia, dissolved oxygen and chlorophyll. Preliminary results show no strong correlation between streams directly adjacent to various land uses such as agricultural or urban.
2. Installation of stream gauges to monitor and record stream depth and velocity to calculate the cubic feet per second (CFS) rating curves at various portions of the streams. This will show how rainwater is being absorbed into the soil versus how much is running off impervious surfaces. During 2008 – 2009, water quantity studies and CFS ratings have been behind schedule due to technical difficulties of the gauges themselves.
3. Soil samples were taken from various regions in the watershed. This reveals the impacts various land uses have on contributing to nutrient run-off. During this sampling, representative farms were toured to visually assess if manure and fertilizing strategies were appropriate. A total of 40 soil samples were taken at representative areas including agricultural land, urban land, stream banks, and forested regions and are currently under analysis. Additional analysis of historical soil samples from inside the watershed will also be analyzed.
4. Field trials on various turf varieties and variety blends to determine which were most resistant to continuous horse hoof traffic were performed. Forty different varieties and blends of turf grass were planted at the Adelphia Research Station in Freehold. Kentucky bluegrasses (*Poa pratensis*), and combinations of Kentucky bluegrass, orchardgrass (*Dactylis glomerata*), tall fescue (*Festuca arundinacea*), and colonial

bentgrass (*Agrostis capillaris*) provided the highest level of wear tolerance. Tall fescues and tetraploid ryegrass (*Lolium perenne*) were intermediate for wear tolerance. Mixtures of forage grasses sold commercially and orchardgrass cultivars were below the mean for the wear and three Timothy (*Phleum pratense*) cultivars were the poorest for wear tolerance.

■ The Center also funded another environmental project in 2007-2009. Principal Investigators on the project are Daniel Giménez and Stephanie Murphy. The goal of the project was to determine the impact of horse manure on soil integrity and water quality. During the past year, activities related to the project were as follows:

1. In the fall of 2008, plots treated with equine manure and composted manure at the Snyder Research and Extension Farm and previously planted to corn were harvested, and yield was recorded. Corn plots at the Ryders Lane Farm were not harvested because of the poor stands field-wide. Soil samples of all plots were taken in the spring of 2009 for chemical characterization.
2. Graduate student Sung Won Yoon developed a soil quality index that will be used to evaluate the effects of horse manure and composted manure on soil quality.
3. A more in-depth study to characterize changes in the quality and quantity of soil organic matter and its placement within the soil matrix was initiated with the March 2009 sampling.
4. Manure/compost treatments were successfully applied to corn plots at both farms, and corn was planted in late May/early June. Soil water content and leachate continue to be monitored at the Ryders Lane Farm. Water infiltration rates, another measure of soil quality, were measured in plots at both the Snyder Research and Extension and Ryders Lane farms. Initial analysis of the data was to be conducted during the summer of 2009.

## **Equine 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. 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.

Our courses tend to emphasize the science of horses—not only “how” as in many other equine curricula, but “why.” Thirty to sixty students are involved in equine studies each semester at the School of Environmental and Biological Sciences. Students interact closely with their advisors and are given guidance in career decisions.



Rutgers has a Memorandum of Understanding with the University of Delaware, Penn State University, and Delaware Valley and Centenary Colleges, wherein our students can take a semester of “how to” classes on topics such as equine breeding management, horse training and conditioning, horse show management, therapeutic riding instruction, and stable management, to name a few.

### **New Public Course Offerings**

In 2008 the Center began offering two new courses which focus on horse health and horse industry leadership. The first, “Advanced Equine Health Care and Management,” is a semester-long program. The second is a two-day short course on “Developing Future Leaders for the Equine Industry.” Both courses are open to adult learners and continuing education students.

“Advanced Equine Health Care and Management” is taught by adjunct professor Michael M. Fugaro of Centenary College and provides an in-depth study of diseases and common emergency disorders of the horse. It utilizes basic concepts of anatomy and physiology, applies them to clinical situations that arise in horses, and teaches students how to effectively manage many of these health-related situations.

“Developing Future Leaders for the Equine Industry” unites a team of instructors led by Karyn Malinowski, director of the Equine Science Center, and Mary Nikola, director of leadership and organizational development with the New Jersey Agricultural Experiment Station. The course features several well-known experts in the field. Subjects include the value of the equine industry, networking and relationship-building, decision-making strategies, leadership practices and behaviors, building coalitions, and industry management. A second session for 2008 graduates was conducted in 2009. Leadership graduates are currently participating in equine organizations such as the New Jersey Equine Advisory Board and New Jersey Horse Council.

### **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. The students must also be New Jersey residents. The Center awarded Doris C. Murphy Scholarships for the 2009-2010 academic year to Caitlin Belding, Lisa Furbeck, Kathleen Richards, Rachel Waltzer, and Jennifer Woodruff. All of the recipients are in the Class of 2010.

## **Community/Industry Involvement**

### **Podcasts**

In the spring of 2008, the Center introduced a series of podcasts as a way to accommodate the public's desire to learn "on the run." They are available for download at [www.esc.rutgers.edu](http://www.esc.rutgers.edu). The source material for the podcasts – Rutgers Cooperative Extension Fact Sheets – consists of original research by Extension and Equine Science Center-affiliated faculty as well as summaries of research and publications produced by other prominent scholars and experts.

More than 40 Fact Sheets address topics of interest to horse owners and horse farm operators and individuals involved in the horse industry. Within the Equine Science Center website, the fact sheets are linked to the Frequently Asked Questions (FAQs) feature, and a dynamic search engine, which make finding answers very simple. The Equine Science Center is among the first at Rutgers to utilize podcasts for learning opportunities and is in the advance corps of leading academic institutions nationwide in adopting this learning method.

### **Horse Industry Alliance**

The Equine Science Center has been a consultant to the racing industry and an advocate for unity and cooperation among the various equine breed groups and disciplines for decades. The urgency for a "unified voice" became critical in 2006, as the issue of the sustainability of the racing industry came into sharp focus among legislators, horsemen, breeders, the agricultural industry, the gaming industry, and academia. The Equine Science Center's role in bringing the various forces together has been recognized for its outstanding value and effectiveness.

The woes of the racing industry were not just confined to a handful of men and women who breed and race horses, however. It was clear then (and still is) that many aspects of the New Jersey economy and the quality of life for residents – not to mention the services that are available to all horse people – depend on a viable racing industry. Exacerbating the problem was the fact that surrounding states had passed legislation enabling limited gaming operations at racetracks in addition to the traditional pari-mutuel betting. These additional gaming revenues resulted in increased purses and breeders' incentives in those states and, as a result, siphon off the best horses from New Jersey. In 2008-2009 Center director Malinowski continued working on behalf of all equine enthusiasts to educate policy decision makers about the importance of horses to New Jersey.

### **Spirit of the Horse Award**

In January 2006, the Equine Science Center was invited to present an award at the annual Breeders Awards Dinner of the New Jersey Department of Agriculture. This event highlights the achievements of the state's horses and horse people, culminating with the Governor's Trophy for the Horse Person of the Year.

The Equine Science Center accepted the honor of awarding its own trophy – timed to be presented just before the Governor’s Trophy – and set about to create a unique honor. Unlike the Governor’s Trophy, which approximates a lifetime achievement award, the Equine Science Center felt that it should honor an individual or individuals whose lives had been changed by horses and who, in appreciation, give back to the horse community through service, financial support, leadership, or a similar impact. The Center called the honor “The Spirit of the Horse” award, and designed a beveled glass frame featuring the Center’s familiar stylized horse head and the name of the honoree and the year the award was given.

The first recipient of the Center’s “Spirit of the Horse” award was Sandra Denarski, chair of the Center’s advisory group, the Rutgers University Board for Equine Advancement (RUBEA) and an executive with Johnson & Johnson. During the reporting period, Patty Hogan and Rick Wills received the 2008 and 2009 Spirit of the Horse Award, respectively.

### **Stakeholder Strategic Planning Meeting**

Every year, the Equine Science Center convenes a stakeholder meeting which brings together diverse segments of the New Jersey horse industry with key faculty and staff associated with the Equine Science Center.

The meeting is designed to encourage open discussion in order to:

- Take the pulse of the industry
- Elicit feedback on Equine Science Center programs and strategies
- Identify the industry’s current issues and concerns
- Share with our constituency the work of the Equine Science Center

Participants were reminded of the mission of the Equine Science Center, which is to ensure the well-being of horses and the health of the horse industry. Center programs employ the teaching, research, and outreach directives required by the land-grant status of Rutgers, The State University of New Jersey. Work is done by multi-disciplinary, interdisciplinary and inter-institutional teams of faculty and staff.

The 2008 Stakeholder Meeting confirmed the horse industry’s needs which were identified in a 2003 study and summarized in the following categories:

- Horse health and well-being
- Right to farm, farm viability and land use
- Integrity of equestrian sport
- Environmental stewardship
- Sustainability of the horse industry and the development of its future leaders

One important goal of the gathering was to identify new issues in need of attention. Special consideration was paid to issues related to the Equine Science Center's programs and expertise.

## **Awards**

Equine Science Center faculty, students, and staff continue to be recognized locally, nationally, and internationally for their accomplishments. In 2008 the Center's equine industry economic impact study was honored as one of three recipients of the 2007 Award of Excellence from the Northeast Cooperative Extension Directors. This is the highest award presented by the Directors of Extension in the northeast. It recognizes Extension outreach programming that has achieved outstanding accomplishments, results, and effects in addressing contemporary issues.

The *New Jersey Equine Industry 2007: Economic Impact* study exemplifies the power of teamwork in leading and accomplishing a mission critical to an important New Jersey industry and answering the needs of stakeholders, while at the same time leveraging funds, demonstrating ingenuity and entrepreneurial initiative, and engaging a significant segment of the populace in a common goal.

The research study was designed to provide a comprehensive picture of the impact of the horse industry on the economy of New Jersey, on traditional agriculture, and on the preservation of working agricultural land and open space. In addition, it incorporated an Extension focus that ensures the final report and accompanying DVD continues to be circulated among policy makers and opinion leaders throughout the state and continues to be cited regularly as Governor Corzine's Commission on the Horse Racing Industry continues its deliberations.

## **Equine Science Society**

Faculty and students from the Center traveled to Keystone, Colorado to attend the 21st Equine Science Society meeting, May 29-31, 2009. Meeting attendees included Center director Karyn Malinowski and associate directors Kenneth McKeever, Sarah Ralston and Carey Williams. Graduate students Emily Lamprecht, Nettie Liburt and Danielle Smarsh and undergraduates Emily Wunderlich and Jennie Zambito accompanied the faculty.

Carey Williams received the outstanding Young Professional award from the Society and McKeever was elected to its board of directors. Sarah Ralston completed her term as a board member. Liburt placed first in the graduate student competition (reproduction/endocrinology section) and Lamprecht placed second in the exercise physiology section.

### **Equine Science Center Travel Scholarships**

The Equine Science Center provided travel scholarships to the three students who presented their research at the meetings. Nettie Liburt was sponsored by Charles Kearns, a recent Ph.D. graduate from the program.

### **Mid-Atlantic Nutrition Conference**

On March 26, 2009 students Katharine Zeigler and Emily Lamprecht won the Undergraduate and Graduate first place awards, respectively, for their presentations of research posters at the Mid-Atlantic Nutrition Conference in Timonium, Maryland.

### **SEBS/NJAES Staff Recognition**

Clint Burgher, manager of the large animal farm, received the 2009 SEBS/NJAES Staff Recognition Award. This award honors and recognizes staff members for extraordinary professional contributions and consistent positive impact within their departments and across the university.

Karyn Malinowski received the Friend of 4-H award at the annual meeting of the New Jersey Association of 4-H Agents held on February 26, 2009 in Mount Holly, NJ. On March 6, 2009 she accepted the Outstanding Women of Somerset County award from the Somerset County Commission on the Status of Women at its 17th annual dinner.

Carey Williams was voted vice chair of HorseQuest. A part of HorseQuest since its inception in 2005, she accepted the nomination while attending the eXtension HorseQuest Community of Practice meeting in Louisville, KY, Jan. 5–7, 2009. Dr. Williams also was awarded promotion and tenure by the university effective July 1, 2009.

Kenneth McKeever was promoted to Full Professor effective July 1, 2009. Dr. McKeever was also appointed to the national Anti-Doping committee.

### **Ernest C. Bell Scholarship**

Tiffany Morey, a senior at Rutgers' School of Environmental and Biological Sciences (SEBS), was the recipient of the Ernest C. Bell Scholarship for 2009. The Ernest C. Bell Memorial Scholarship Fund was established by the New Jersey Equine Advisory Board to perpetuate Mr. Bell's memory and his ideals of courage and determination.

## **Business Operations**

At the end of 2008, following October's stakeholder meeting, the Equine Science Center organized an off-site retreat to review the Center's progress and envision the future. The Equine Science Center is grateful to Sandy Denarski, chair of RUBEA, for hosting the event and contributing her time and effort to its success.

Participants in the retreat, in addition to Ms. Denarski, included Stephen Dey II, RUBEA vice-chair; Karyn Malinowski, Center director; Kenneth McKeever; Sarah Ralston and Carey Williams, Center associate directors; Diana Orban Brown, Center director of communications; Anastasia Miklojcik, Center administrative assistant; and students Emily Lamprecht, Nettie Liburt and Emily Wunderlich.

The group reviewed the accomplishments of the Center and discussed the Center's competitive position vis-a-vis other institutions of higher learning. It then divided into working groups to probe the Center's current and future strengths, weaknesses, opportunities and challenges.

At the end, the group reviewed the mission and vision of the Center. The mission, which is the Center's statement to the world of who we are and what we do, was endorsed in its current form:

**The Rutgers Equine Science Center is dedicated to better horse care through research and education to advance the well-being and performance of horses and the equine industry.**

However, the vision – the internal principles driving the Center – was amended with a view to the future:

**The Rutgers Equine Science Center is recognized locally and globally as the primary resource for everything equine. We accomplish this through:**

- **Educating students, stakeholders and the public**
- **Training advocates for equine and other agriculturally-based industries**
- **Finding solutions through science-based inquiry**
- **Exploring the relationship between horses and humans**

In 2009 the Center director, associate directors and director of communications developed a new business plan for the period 2009-2014. The document looks at what the Center has accomplished in the past five years and sets out a roadmap for future activity and progress.

Since 2003, a wide range of implementation activities have taken place to provide substance and direction to the Equine Science Center and to bring it into a place of prominence within New Jersey, the region, nationally and even internationally. If its plan was to become a resource (the “docking station”) for information and science-based solutions to problems and issues in the horse industry, then it has achieved that goal.

#### **Center Objectives for the Period 2009-2014:**

1. To continue providing clearly-defined programs and deliverables for the Equine Science Center.
2. To communicate the programs, deliverables and implementation progress of the Equine Science Center sufficiently and successfully to the administration, faculty

- and staff of Rutgers, the School of Environmental and Biological Sciences, the New Jersey Agricultural Experiment Station, RUBEA, stakeholders, other interested groups and the public at large.
3. To create a succession plan for the leadership and administration of the Center.
  4. To secure sufficient capital and operating funds for the Center to ensure its viability for 10 to 20 years or more.
  5. To expand the breadth and scope of the Center's research, teaching and outreach capabilities.

### **Website Expansion**

The Equine Science Center website at [esc.rutgers.edu](http://esc.rutgers.edu), launched in February 2004, underwent significant expansion in 2008/09 with the addition of several new features:

- A site-wide update, changing the color theme and logos to meet University Identity standards.
- The addition of several pasture management topics to our Frequently Asked Questions area.
- A podcast page, offering fourteen Center-produced audio podcasts which cover various topics on equine nutrition, management, and farm management. The information in the podcasts was adapted from Center Fact Sheets.
- An area within the "Professionals" page dedicated to important news memos from the New Jersey Department of Agriculture.
- A special "Giving Honor Roll" page which features the names of the Center's "Community of 50 for Equine Excellence" and an extensive list of both people and animals who have been honored or memorialized with a gift to the Center.
- A sub-site which focuses exclusively on the Horses 2009 educational conference.
- The creation of an RSS (Really Simple Syndication) feed containing Center press releases and other noteworthy items. Since its implementation, the RSS feed has become the second most visited feature on the site.
- The addition of the "ShareThis" feature to several pages within our website, enabling visitors to share Center webpage links through a variety of media (email, Facebook, Reddit, LinkedIn, etc.)

The introduction of these resources generated a threefold increase in site visits since the previous report. In 2008, site visits averaged between 21,600 and almost 35,000 per month, for a total of almost 333,000 visits for the year. This trend continues into 2009.

The website continues to be a potent marketing tool in addition to its more traditional role as an educational instrument and resource center. The partners and sponsors of Horses 2009 will enjoy a year-long presence on the website, with links to their propriety sites. We are hoping that this marketing relationship will pay strong dividends in the future.

As for the website being a resource, the most popular searches continue to be for information about equine nutrition, horse behavior, equine management, stable/farm and pasture management, poisonous plants, supplements, and similar topics related to horse and farm care. Introduced in 2005, the “Ask the Expert” feature – a resource managed by Carey Williams that posts the most relevant questions and answers she receives from the public – remains in the top five entry pages for the website.

Future plans for the website include a youth-oriented component that will attract younger members of the equine industry. The Center will work closely with New Jersey 4-H to design an area that will engage and educate youth without duplicating the efforts and materials on the 4-H website.

### **Expansion of Center Faculty and Staff**

During the time period of the report, the Center added several new faculty and staff members including Michael Fugaro, adjunct faculty member from Centenary College; Jan Onishi, a visiting scientist in Plant Biology and Pathology; and Dan Kluchinski, Chair, Agricultural and Resource Management Agents department. The individuals are involved in the research projects funded by the Equine Science Center or related to the key initiatives of the Center. During the time period of the report, the Center added several new graduate students Ryan Avenatti, Nettie Liburt-Weiner, and Danielle Smarsh. The students are involved in the research projects funded by the Equine Science Center or related to the key initiatives of the Center.

### **Marketing and Public Relations** **“Advertorial” Series**

The Equine Science Center continued its major marketing campaign in 2008/09, positioning the Center as the provider of wide-ranging services to the public. Using the format of a notebook page with attached “Polaroid”- type photos, the “advertorials” (a combination of editorial and advertisement) were placed in several horse industry publications over the course of 18 months. Advertorial subjects included:

- An overview of the work of the Center
- Environmental regulations and the creation of environmentally sound best management practices
- The need for, and the Center’s availability of, reliable, scientifically-based information on horse health
- The potential shortage of large animal veterinarians, and how Rutgers and the Center are preparing students to enter veterinary studies
- Extensive studies of supplements, substances, feeding and nutraceuticals
- Equine opportunities at Rutgers for students who love working with horses
- Announcements about Horses 2009 that featured the program, testimonials, speakers, partners and sponsors and other information about the educational conference



In all, seven variations of the advertorials were written and produced for equine publications, including Horse News, Equine Journal, Sidelines, Pennsylvania Equestrian, and others. Feedback from stakeholders was very positive, and the series generated sponsors and registrations for Horses 2009 as well as increased visibility for the work and people associated with the Equine Science Center.

In addition to the advertorial series, the Center produced three major marketing pieces: an audio CD containing eight of the Center's most popular podcasts in nutrition, horse management, and farm management and safety; a four-color education/solicitation brochure with a business reply envelope; and four "campaign cards" designed to work with the New Jersey Agricultural Station's "mix and match" information kit system. Card topics included an overview of the Center's work, highlights of environmental best practices, research on supplements and nutrition, and efforts in producing future veterinarians.

### **Media Relations**

Seventeen press releases were produced by the Equine Science Center and distributed to the media from 2008 through mid-year 2009. In addition, in June 2008, as part of their feature on Triple Crown hopeful Big Brown, the ABC television network program "Good Morning America" interviewed Karyn Malinowski about what gives a racehorse the incentive to perform when it enters the homestretch. Dr. Malinowski was also invited to appear on Senator Nia Gill's television show, to discuss the importance of the New Jersey horse industry.

### **Open Houses**

In July 2008 the Center initiated its quarterly Open Houses to accommodate the many requests it receives from the public for tours and treadmill demonstrations. Attendees include prospective donors and students. In addition to an overview of the Center's work and the ever-popular treadmill demonstration, attendees witness a "mock experiment" conducted by graduate students.

### **Newsletters**

The Center produced a record number of newsletters during this period: three eight-page newsletters and one four-page newsletter. Topics included an overview of the podcast series, the Young Horse Teaching and Research Program, the role of the horse in human health, an in-depth look at the advertorial series, faculty, staff and student awards, highlights from the Open Houses, the Giving Honor Roll, expanded public learning opportunities, and, of course, Horses 2009. Each newsletter is distributed to more than 5,000 recipients, and it also is posted on the Equine Science Center website for the convenience of stakeholders and as an archive.

## **Fund-Raising and Development**

In 2009, the Center secured a quasi-endowment at the Rutgers University Foundation with over \$300,000 in this account. For the period of 2008-2009, \$313,241 was procured in cash gifts and donations, of which Horses 2009 was responsible for \$92,000 through registrations and sponsorships. Not included in this total are the six-year pledges of the members of the “Community of 50 for Equine Excellence.” Since returning to the Center full-time, the Center director has been very busy visiting with alumni, donors, board members and anyone who wants to learn about the Center.

On April 16, 2008 the inaugural dinner lecture entitled, “The Horse as a Model for Human Medicine” was presented by associate director for research, Kenneth H. McKeever as a fundraiser for the Center. Dr. McKeever enthralled the audience with his informative talk about the horse’s role in medical research, which dates back centuries. Alumna Cathy Ball (1979) has joined RUBEA and is the new chair of the Friends of the Rutgers Equine Science Center Club.

Since our last communication the Center also has three new members of the “Community of 50 for Equine Excellence.”

Overall, the fund-raising focus of the Center continues to be an endowment of \$3 million. The Center has called upon its advisory board to wholeheartedly assist in achieving the endowment; a reorganization of the board took place which included the formation of the “Friends of the Rutgers Equine Science Center Club,” headed by Cathy Ball.

### **Rutgers University Board for Equine Advancement (RUBEA)**

In 1992, a committee of stakeholders representing various equine interests formed the Equine Advisory Committee to support Cook College (now known as the School of Environmental and Biological Sciences). The committee secured from the New Jersey Legislature an allocation of \$1.2 million in uncollected pari-mutuel winnings for the New Jersey Agricultural Experiment Station – of which \$300,000 is used to support equine research and the facilities and operations of the Equine Science Center. (Subsequently, \$900,000 in funding to the Experiment Station for special initiatives was made a line item in the state budget.) The Equine Advisory Committee evolved into a more formal advisory group, the Rutgers University Board for Equine Advancement (RUBEA). Over time the goals and composition of the board have been modified as conditions required.

During its reorganization in 2008-2009, RUBEA modified its mission and vision statements as follows:

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

**The vision of RUBEA is to be recognized as the advisory, advocacy, and fund-raising organization for the Rutgers Equine Science Center, meeting financial needs for its sustenance and growth.**

Membership on the board, once drawn from a wide spectrum of equine organizations in the state, was redefined to emphasize individuals and organizations who have had an impact on the horse industry, not only in New Jersey but nationally and internationally, and have the desire and wherewithal to assist the Equine Science Center in meeting its fund-raising goals. RUBEA hopes this expanded function will make it as effective as possible in promoting the stature and progress of the Equine Science Center and assuring its continued vitality.

In 2008-2009 seven new members joined the board: Cathy Ball, VMD; Debra Bahr, Liz Durkin, Leo McNamara, Mark Mullen, Tom Swales and graduate student representative Nettie Liburt-Weiner. Dr. Ball will chair the Veterinary and Alumni sub-committee (now known as the “Friends of the Rutgers Equine Science Center Club”). Ms. Bahr and Durkin bring expertise and contacts from the dressage and hunter/jumper worlds, respectively; and Mr. McNamara, Mullen and Swales represent the racing segments of the equine industry. The Center expresses its deepest appreciation to Dr. Suzanne Smith, whose term ended this year, for her service to the board.

## **Events**

Events coordinated and hosted by the Equine Science Center or where Center Description and Activities was presentation focus:

### **2008**

January 26	Horse Management Seminar
January 27	New Jersey Breeders Awards Dinner
April 3	Philadelphia Society for the Promotion of Agriculture – Student trip
April 5	Junior Breeders Event
April 16	Horses and Humans Dinner Lecture – presentation by Kenneth McKeever Spirit of the Horse Award presented to Patty Hogan
April 26	Ag Field Day
April 27	Young Horse Teaching & Research Program Yearling Auction
May 2	First Career Day/Animal Science Career Fair held – Cook Campus Center

May 8 - 11	Jersey Fresh – Three-Day Event
May 15	Farm and Land Management Short Course – Snyder Research Farm
May 17 – 18	NJ Horse Expo – Hunterdon County
May 22	Farm and Land Management Short Course – Salem County, Extension Office
May 30	Expanded Equine Science Center Meeting
June 15 – 18	American Horse Council Convention
June 21	Gloucester County Dream Park – Grand Opening Event
July 14	NE Extension Awards Ceremony – Washington, DC
July 30	ESC Open House for Hambletonian Week & Haskell Stakes Day
August 1	Hambletonian Continuing Education Seminar
August 3	Haskell Invitational
August 10	Festival of Horses at NJ Horse Park
August 22 - 24	State 4-H Horse Show
September 20	All-Breed Horse Show – NJ Horse Park
September 21	Lord Stirling Stables – “What the Rutgers Equine Science Center Does for You” presented by Karyn Malinowski
October 2	Philadelphia Society for the Promotion of Agriculture – Tour of Treadmill Lab
October 17	Stakeholder Meeting & Open House Event
November 9	Turkey Trot - NJEAB
November 11	Hunterdon County Horse & Pony Association – “What is the Rutgers Equine Science Center” - Karyn Malinowski
November 17 – 19	NJ Farm Bureau Convention
December 9	Equine Science Update/Treadmill Demonstration and Tours

**2009**

January 25	Breeders Award Dinner – Spirit of the Horse Award given to Rick Wills
February 10-11	NJ Ag Convention
February 20	Career Day/Animal Science Career Fair
February 28	Douglass Science Initiative Career Day
March 21	Junior Breeders Event
March 28 - 29	Horses 2009 Conference
April 25	Rutgers Day
April 26	Young Horse Teaching & Research Program Yearling Auction
May 6 – 10	Jersey Fresh – Three-Day Event
May 7	Philadelphia Society for the Promotion of Agriculture Seabrook visit – Student trip
May 16	Alumni Reunion/Open House Treadmill Demo
May 21	Dr. William Martin-Rosset Seminar
May 29 – June 1	ESS Meeting in Colorado

## **Future Plans**

In 2009-10 the Young Horse Teaching and Research program will be "re-inventing" to accommodate changes in horse industry needs. The Premarin industry NAERIC horses are now well recognized as valuable equine animals, commanding high prices even as weanlings. Dr. Ralston's research over the past 10 years has documented the unique nutritional needs of draft cross horses and has allowed refinement of the selection process based on behavior and conformation. These horses are no longer "at risk" and have well established markets in a variety of disciplines.

Over 9,000 BLM mustangs, however, that have been culled from the public ranges to prevent overgrazing, are in need of help. General public perception is that mustangs are "wild", difficult to handle and not very useful. Our goal is to change that perception by incorporating yearling mustangs into the Young Horse Teaching and Research Program. It is anticipated that they will not be that different to train than unhandled NAERIC weanlings and, as long as they are selected based on the same criteria established over the years with regard to conformation and behavior, they will be very attractive, well behaved young horses with tremendous athletic potential in a variety of disciplines by the time the annual auction is held in 2010.

The Center website will be modified to feature two new sections: Responsible Horse Ownership; and an interactive youth component, featuring the Center's unique niche of providing cutting edge science to ensure better horse care through research and education.

On the academic side Center faculty will pursue international collaborations with exchange students and plan to offer at least two new courses in the coming few years.

## APPENDIX A

### Comparative Analysis – Equine Science Teaching, Research and Outreach Programs

While our comparative analysis turned up: 47 land grant universities, 17 other public universities and colleges, 11 private universities and colleges, 4 private organizations and 28 veterinary schools nation-wide with an equine emphasis, none demonstrated the characteristics that distinguish the Rutgers Equine Science Center.

In comparison with these other entities, The Rutgers Equine Science Center, in its mission of “Better Horse Care through Research and Education,” offers the following unique distinctions:

- The Center is the only integrated, multidisciplinary equine science center to not come under the umbrella of a Department of Animal Sciences or Veterinary School.
- Because of its concentration on the health and wellness of the equine athlete and the equine industry, the Rutgers Equine Science Center occupies a unique niche nationally and internationally.
- Research and outreach programs are stakeholder-driven to meet the needs of the state and region.
- The Center is one of few land-grant universities (without a veterinary school) to recognize the socio-economic value of horses.
- The Center is one of few centers or equine science programs to have a university-recognized advisory board made up of stakeholders.
- The Center is the only equine “center” in the nation to deliver integrated programs of instruction, research and outreach in multi-departmental, multi-disciplinary, multi-institutional and multi-state fashion when examining almost any issue or challenge facing the well-being of horses or the horse industry.
- The Center is the entity responsible for translating useful, science-based information to people around the world through its robust website which disseminates news; posts podcasts, numerous fact sheets and bulletins and hosts the details of Center conferences such as Horses 2009.
- The Center undertakes partnerships with veterinary schools, other equine research centers and horse farm owners to conduct work designed to prevent illness and injury, not to repair damage once it occurs.
- The Center helps the equine industry identify its weaknesses and strengths in order to find solutions to ensure sustainability.
- The Center has designated state funding for Center sponsored research and activities.
- Center research teams lead the nation in addressing issues such as industry sustainability, pasture and manure management, environmental stewardship and the use of the horse as a model for human medicine.
- The Center has a solid track record of preparing students interested in equine science for graduate or veterinary school.

- The Center website hosts an Honor Roll for beloved family, friends, horses and other pets.
- The Center is the only institution to offer a leadership development program for those interested in acquiring leadership positions in the industry.
- The Center offers continuing education credits for veterinarians and veterinary technicians.
- The Center does not attempt to duplicate successful equine production and or equestrian programs elsewhere.
- The Center's niche is science-base experiential training for students; which is translated for constituents.
- Center equine research and teaching facilities are in close proximity to campus.



**APPENDIX B**  
**State Equine Initiative Grant Funded Projects**  
2008-2009

**Effects of Age and Training on the Cytokine, Myokine, and Endocrine Regulation of Glucose Metabolism**

PI Kenneth H. McKeever

**How Specific Gut-Derived Bacteria Could Influence Development of Laminitis**

PI Janet Onishi

**Horse Manure to Bio-energy for On-Farm or Regional Application**

PI Donna Fennell

**4-H Youth Development Horse Programs**

PI Carol Ward

**On-Farm Best Management Environmental Practices for Horses**

PI Carey Williams

**Influence of Diet and Bedding Characteristics on Manure Excretion, Manure Characteristics and Air Quality**

PI Michael Westendorf

**Agri-environmental Assessment of Equine Pastures and Trails in the Colts Neck Watershed**

PI William Sciarappa

**Assessing the Impact of Horse Manure and Composted Manure on Soil and Water Quality**

PI Daniel Gimenez