RUTGERS UNIVERSITY EQUINE SCIENCE QUARTERLY



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Evening of Science & Celebration



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RUTGERS New Jersey Agricultural Experiment Station



Celebrating 20 Years Of Excellence At The Rutgers Equine Science Center

hile the Equine Science Center is celebrating its 20th anniversary this year, the history of the Center, and the building of its foundations, goes back many, many more.

For over 40 years, faculty, staff, and students have worked to make equine science an essential part of Rutgers University. The first large investment in this idea came in the form of establishing an equine science program.

In 1978, Cook College established an equine science program as part of its Department of Animal Sciences. With a focus on conducting research in the areas of exercise physiology; aging, growth, and development in horses; and nutrition; this was a huge success.

Dr. Karyn Malinowski was hired the same year, becoming the Equine Extension Specialist for Rutgers Cooperative Extension.

Malinowski was no stranger to Rutgers though, as she earned her Ph.D. from Rutgers University and the University of Medicine and Dentistry of NJ in Zoology, and her masters and bachelors from Rutgers University in Animal Science.

From The Clubhouse



Dear Friends,

Here's hoping that you all are getting to enjoy some cooler weather as fall is upon us and with it some much anticipated relief from the heat. Get out there with your four-legged friends and take in what should be a spectacular display of fall foliage!

The Equine Science Center continues the celebration of its twenty-year anniversary of delivering "Better Horse Care through Research and Education" to our constituents to benefit horses and horse farm owners alike. Besides being recognized by the Governor and New Jersey Legislature with proclamations, I also have been asked to present an overview of twenty years of excellence from the Center at a Rutgers University alumni event on November 3. I will talk about the history and timeline of the Equine Science Center, highlights throughout the years, as well as current and upcoming research. Take a look at the event flyer on Page 4, and read our feature story on the Center's "20 Years of Excellence" beginning on **Page 1**.

This academic year we still are conducting all of our events virtually. This will include our upcoming "Evening of Science and Celebration" on Thursday, November 11, which just happens to be Veterans Day! Our keynote speaker will be Dr. Sarah White-Springer from Texas A&M University. Dr. White-Springer will be discussing her latest research investigating the effect of mitochondrial activity and athletic performance in horses. We also will hear an update from Jennifer Weinert-Nelson on her pasture research (which you can get a preview of in the "From the Lab" section on **Page 10**), and Ellen Rankins on her study looking at the effects of Equine Assisted Services on veterans with PTSD. We also will be presenting the "Spirit of the Horse" award to Assemblyman Ronald Dancer and the Gold Medal Horse Farm award to a yet to be determined New Jersey horse farm. Learn how to register on **Page 13**.

Speaking of Jennifer Weinert-Nelson, Jen successfully defended her Ph.D. dissertation on September 16 so we can now call her Dr. Weinert-Nelson! Congrats Jen! Jen certainly has been an integral part of the Equine Science Center team and we will miss her terribly and wish her only the best as she moves onto the next phase in her life.

Regarding Ms. Rankins, the Recruitment Phase for the EAS veterans research project continues. The Center has recently opened its recruitment criteria to include male combat veterans from any theatre of combat, aged 18-75, with and without post-traumatic stress disorder (PTSD) to participate in a research study on co-regulation and the effects of equine assisted services on symptoms of PTSD. We also need controls or males who are not veterans to pair match with the veterans. Take a look at the story on Page 11 to learn more about the research being conducted, and at **Page 17** for our updated flyer!

Finally, preview Lord Nelson's Blog where he covers some fun ways to decorate for the fall. Learn more on **Page 18**!

On a personal note, I want to share the fact that I lost my partner of 32 years, Tom Mannos, on August 11. Tom gave to the horse industry everyday of his adult life and the outpouring of condolences to me and his family is much appreciated. The "Voice" of equestrian sport is now silent but will remain in many people's memory forever.

> All the Best, karyn

PARTNERS



New Jersey Farm Bureau's primary purpose is to represent the overall interests and improve the financial well-being of farmers and our \$800 million industry. NJFB activities are supported through voluntary membership and annual dues. Members have access to:

• Staff assistance on farming issues and regulatory problems.

Educational workshops on topical issues such as farm labor, wildlife damage, and zoning.
Weekly updates on legislation news and regulations affecting all aspects of farming.

It pays to be a NJ Farm Bureau member! For a full list of membership levels and benefits, or to sign up, visit: www.njfb.org.



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UMH has been in business since 1968, operating as a public company since 1985. Owning a portfolio of over 90 manufactured home communities, housing approximately 15,700 home sites.

In addition, owning over 810 acres of land for the development of new sites. It is our mission as a company to provide the best quality affordable home for the hard working residents of Pennsylvania.

UMH communities are perfect for residents of all ages, let us help up you find your dream home today.

For more information about UMH Properties, Inc., please visit: www.umh.com



The New Jersey Department of Agriculture (NJDA) is an agency which oversees programs that serve virtually all New Jersey citizens. One of the Department's major priorities is to promote, protect and serve the Garden State's diverse agriculture and agribusiness industries.

In addition to the programs we offer to support production agriculture, NJDA also manages programs that feed schoolchildren, distribute surplus federal foods to soup kitchens and pantries that serve our needy citizens, conserve precious soil and water resources, protect farmland from development and preserve it for future agricultural use, expand export markets for fresh and processed agricultural products, and promote our commercial fishing industry, and administer the complete program of agriculture, food and natural resource education, which includes the State FFA Association.

For more information about NJDA, please visit: www.nj.gov/agriculture

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The lives of animals and humans are interconnected in deep and complex ways. We know that when animals are healthy, humans are healthier too. Across the globe, our 9,700 employees are dedicated to delivering value through innovation, thus enhancing the well-being of both. Respect for animals, humans and the environment guides us every day. We develop solutions and provide services to protect animals from disease and pain. We support our customers in taking care of the health of their animals and protect our communities against life- and society-threatening diseases.

For more information about Boehringer Ingelheim Animal Health, please visit: www.boehringer-ingelheim.us

UPCOMING 2021 - 2022 VIRTUAL EVENTS

20 Years of Excellence At The Rutgers Equine Science Center

Wednesday, November 3, 2021

Click Here To Register

https://go.rutgers.edu/20Years

2021 Evening of Science & Celebration

Thursday, November 11, 2021

Click Here To Register

https://go.rutgers.edu/Evening2021

2022 Horse Management Seminar

February 8, 15, 22, 2022

Save The Date

carey.williams@rutgers.edu

For more events, visit our website @ esc.rutgers.edu

Celebrating 20 Years Of Excellence At The Rutgers Equine Science Center

Continued from Pg. 1



Dr. Karyn Malinowski shows students how to bandage a horses leg during a course she taught at Rutgers.

When Malinowski joined Rutgers University as an extension specialist, it also marked the hiring of the first female equine extension specialist in the entire United States.

Her work at Rutgers included the development of educational programming, and in the early 1980's she collaborated with the New Jersey Horse Council to create the first annual "Horse Management Seminar." Held in conjunction with the New Jersey Department of Agriculture's yearly Agricultural Convention in Trenton, New Jersey, this brought equine science to the main stage at a state level.

Recognizing the importance of working with her equine constituents, she encouraged them to engage with the university to show the need for equine science, the benefits of the program, and how funding could allow the program to grow into something more.

So, with the outcry of support from constituents, in 1991 the Cook College and the New Jersey Agricultural Experiment Station established the Rutgers University Board for Equine Advancement (RUBEA) as an advisory body, to promote and support equine teaching, research, and outreach through fund-raising and legislative efforts.

This notable and dedicated group of horse industry leaders from the private sector, education sector, and New Jersey agricultural sector, included representatives from the New Jersey Division of Animal Health, the Standardbred Breeders and Owners Association, the Thoroughbred Breeders Association of New Jersey, the New Jersey Horse Council, the New Jersey Thoroughbred Horseman's Benevolent Association, the New Jersey Equine Advisory Board, and the State Board of Agriculture.

Under the leadership of Taylor Palmer, Jr. as the first Chair of this group, RUBEA was able to successfully secure from the New Jersey State Legislature a yearly \$1,000,000 line-item allocation to the New Jersey Agriculture Experiment Station, of which \$300,000 was allocated to the Rutgers Equine Science Center.

This \$300,000 allocation was not only used for equine related projects, but was it was also used to make improvements to the Cook Farm and to fund other animal science research.

During the 1990's, the foundation of what would become the Equine Science Center continued to be built.

This included the hiring of two more equinespecific faculty members, the creation of a teaching/ research herd at the university for students to receive hands-on experience with horses, and the internal push for the creation of a full-fledged center to address the needs of the equine industry as a whole. This multidisciplinary center, with collaborators from not only within Rutgers University but beyond, would be designed to include specialists in equine nutrition, pasture management, manure management, entomology, and agricultural economics among the many other specialties needed to address all of the industry's needs.

With RUBEA's support, and the funding from the state showing the importance of equine science, in 2001 the Rutgers University Board of Governors named the Equine Science Center as an official center at Rutgers University.

Malinowski, who had become a nationally known specialist in equine sciences, as well as an animal science professor, was appointed as the inaugural Director of the Center. Her first goal was to "put together teams of faculty, students, and staff to address the challenges impacting horse health and well-being," said Malinowski, "and to look at the future of the New Jersey equine industry, and what that meant for the state.

As the Center grew in notoriety, the need to distribute information to stakeholders, equine enthusiasts, and the general public increased as well. Like most entities at this time, this meant the creation and launch of a website so that constituents both far and wide would be able to access the research being conducted at the Center. So in 2002 the Center launched its first website, www.equinesciencecenterrutgers.com.

The site provided the history of how the Center came to be, research updates in the form of "Fact Sheets" (guides on specific topics with scientific research results written for the everyday layperson to benefit from), upcoming events and seminars, and information on how to support the Center and donate.

Yearly events included the Horse Management Seminar, which provided a day-long seminar on a specific topic with multiple presenters; the Equine Research Update, an evening event to showcase the most recent research from the Equine Science Center and its collaborators; Cook College Ag Field Day, celebrating and showcasing the animals at the Cook Farm; and finally, the annual Young Horse Teaching & Research Auction, where attendees were able to bid on yearlings which were trained by students with the chance to get their very own "RU Horse".



Ms. Sandy Denarski, a longtime friend of the Center and past RUBEA Chair, poses in the Equine Exercise Physiology Lab.

In 2006 the Center decided it was time to start recognizing some of the amazing people from within its equine community. As such, the Center presented the first "Spirit of the Horse" Award to Sandy Denarski, a longtime friend of the Center and past RUBEA Chair.

This award was created to recognize 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.

The Center also looked towards the horse industry for one of its largest projects, and investigated the economic impact of horses on New Jersey. "This report was critical to documenting the importance of horses to New Jersey", said Malinowski. "This data did not previously exist."

This report, "The New Jersey Equine Industry 2007: Economic Impact," would go on to become an award-winning project and the first of its kind for the state. It would also be used as a template nationally for other economic impact reports on agricultural related commodities.

In 2008 the Center would go on to unveil another nationally recognized project. Working for over three years at the farm located on Ryders Lane, the Center collaborated with Region II of the U.S. Environmental Protection Agency; The Natural Resources Conservation Service; The Northeast Sustainable Agriculture Research and Education program of the USDA; The New Jersey Department of Agriculture; The



Located off of Ryders Lane on approximately 30 acres, the "Ryders Lane Environmental Best Management Practices Demonstration Horse Farm" is not only a model best management practices horse farm, but also a learning center where research, education and proactive outreach through live demonstrations and twilight seminars enrich the public's understanding of how to successfully manage the environmental challenges their farms may pose.

New Jersey Department of Environmental Protection; The Center for Turfgrass Science at Rutgers University; The Department of Animal Sciences, SEBS, Rutgers University; The Department of Ecology, Evolution, and Natural Resources, Rutgers University; The Department of Environmental Sciences, Rutgers University; and The New Jersey Agricultural Experiment Station to create the "Ryders Lane Environmental Best Management Practices Demonstration Horse Farm".

The first of its kind in the nation, the farm had been transformed into a sterling example of using environmental research findings to improve farms not only for the animals, but for farmers as well.

Improvements on the farm were paired with educational signs and handouts that included detailed examples of the work, and how these changes benefited the environment. Topic areas included farm and pasture management, water quality management, nutrient and waste management, weed control, fencing, pasture rotation, and soil enrichment.

Recognizing the environmental acuity that the Center now possessed, in 2009 the Center was called

upon to help with the educational campaign helping NJ horse farm owners come into compliance with the new Animal Waste Management rule. This rule required that farms with a certain number of animals (dependent on total weight of all animals) would have to create an animal waste management plan for what happens to animal waste on their farm.

After some brainstorming (and a phenomenal name coming from one of the children of a professor in the Department of Animal Sciences) the "Scoop on Poop" educational campaign was born. The campaign included educational programs hosted by Cooperative Extension offices to not only inform the public of the new rule, but to also help bring them into compliance with it. Educational brochures, CDs, and online information; and give-a-ways including mousepads and magnets made the educational program a huge hit with farms and the public alike.

Needing a mascot for the project, the Center brought a notable horse out of retirement to become a new "teacher" of sorts. Retiring (for the first time) from Rutgers in 2000, Lord Nelson was known as one of the first horses from the Rutgers University Mounted Patrol; and, more famously, as the first and only horse to ever receive an official football penalty in a NCAA football game.

Nelson served as the horse that was ridden by the Scarlet Knight at Rutgers football games, and during a close game against Army in 1994, Nelson broke onto the field and raced all the way down the sideline to the opposite end of Giants Stadium. Receiving a yellow flag for his "un-sportsHORSE-man like conduct," he almost cost Rutgers the game.

With a personality and notoriety like that, he was the perfect fit, and thus Lord Nelson became the first equine "faculty member" at Rutgers.

Recognizing the importance of Science, Technology, Engineering, & Math (STEM), in 2010 the Equine Science Center launched the popular STEM education youth portal, "Equine Science 4 Kids," featuring Lord Nelson in his new job.

The portal was designed as a fun way for kids to interact with the cutting-edge research conducted at the Center, while at the same time having the sciences brought to a level that they could understand. Games and activities provided a component of fun when learning about topics such as nutrition, equine exercise physiology, and environmental stewardship.

Environmental Stewardship became a focus point for the Center's older audience as well, and in 2013 the Equine Science Center, in collaboration with the New Jersey Agricultural Experiment Station at Rutgers and the New Jersey Department of Agriculture, started honoring those that were incorporating environmental best practices into their farms. Thus, the "Gold Medal Horse Farm" Award was created to showcase the best horse farms in New Jersey for the environment.

To guarantee that the Center stayed up to date with the changing times and enticed younger audiences to the Center's decades long research, from 2015 to 2016 the Center rebranded its website, newsletter, and other constituent facing materials to appeal to audiences at every level.

With this new face-lift, and more attention than ever, planning began on how to celebrate the Equine Science Center's 15th Anniversary and showcase all of these changes.

So, in 2016 the Center staff started putting together a weekend-long extravaganza. The weekend-long

seminar was titled "Horses 2017: The Best of the Best," and invited back speakers from many of the events that the Center had hosted over the years.

Topics like saddle-fit, pasture and manure management, and horse care 101 were just some of the many topics that were included. Keynote speakers opened up the event each morning, and guests were allowed to pick their own courses throughout the day based upon their individual interests.

Each day was closed with the ever popular "Ask the Experts" panel where attendees were allowed to ask questions that they had come up with during the presentations, or even bring their own personal questions for the experts to answer.

As a part of these 15th Year Anniversary celebrations over the course of the academic year, the Center was presented with a congressional certificate from U.S. Rep. Donald Norcross, and a special proclamation from the Governor's office, sponsored by N.J. Senator Bob Smith and N.J. Assemblymen Joseph Egan and Joseph Danielsen, to honor the Center's work into "Better Horse Care Through Research & Education."

In 2018 the Center started work on rebranding the popular "Equine Science 4 Kids!" Program to include new games, activities, and handouts to complement the online version of the program.

This included the new Equine Dentition Game, which was showcased at the 2018 Junior Breeders Livestock Symposium, and provided young equine scientists with the knowledge to sex and age a horse based solely on the game-piece teeth that were provided to them.



Elena Rizzo, an alum and former staff member, demonstrates how to age and sex a horse based on dentition alone.

The following year the Center published the "2019 State of the New Jersey Horse Racing Industry," racing report, which helped to secure \$20,000,000 annually over the course of five years for horse racing in New Jersey.

This report showed how non-competitive New Jersey's horse racing industry was when compared to surrounding states which supplemented purses with other income, such as alternative gaming.

As with the rest of the world, 2020 changed the way that the Center functioned. Everything was moved to a virtual landscape, and with it came changes as to how the Center interacted with its constituents.

A weekly web-post, "Keeping Engaged While Keeping Safe – Resources To Keep You Busy While We #StayHome" gave constituents a way to still interact with the Center.

Each week a list of resources on any given topic, such as pastures, antioxidants, and even safety were presented to constituents with a post. The post included things such as newsletter articles, fact sheets, podcasts, and other media.

Unfortunately, staying home lasted a little longer than everyone was hoping for, and thus some of the Center's new activities were put into storage. A brand new "Equine Science 4 KIDS!" Activity Book was published, but the Center couldn't distribute them at Rutgers Day like originally planned. Instead, kids were kept engaged with the "Equine Trivia Tuesdays 4 KIDS!", a weekly trivia night that quizzed kids on all things horses. Prizes were given, and it was so successful that the Center brought it back in 2021 for another round.

As a special surprise to participants, they received the first copies of the new "Equine Science 4 KIDS!" Activity Book for participating, much to their delight.

In the summer of 2021, the Center was honored in a few different ways. As a part of the 2021 "Month of the Horse" Celebration, the New Jersey Governor's office honored the Equine Science Center with a Proclamation honoring the Equine Science Center for its 20th Anniversary.

The Senate and General Assembly of New Jersey also honored the Center for its 20th Anniversary with a Joint Resolution sponsored by Senator Thompson, and Assemblymen Dancer and Clifton.

As the Center continues its celebration of 20 years, it has events, seminars, and activities to continue keeping constituents active and engaged.

These plans include a webinar on November 3rd "20 Years of Excellence at the Rutgers Equine Science Center," the annual "Evening of Science & Celebration" scheduled for November 11th, and the annual "Horse Management Seminar" scheduled for February.

To learn about all of these events please take a look at the events section of the newsletter on *Page 3*.



The redesigned and rebranded "Equine Science 4 KIDS!" Program includes the "Equine Trivia Tuesdays 4 KIDS!" trivia nights, an updated web-portal on the Equine Science Center website, and a new "Equine Science 4 KIDS! Activity Book" complete with color pencils.





Online - Zoom information sent upon registration

November 3, 2021 7:00 PM-8:00 PM ET **Register Now**

Already registered?

20 Years of Excellence at the Rutgers Equine Science Center

Please join us for a special presentation by Dr. Karyn Malinowski CC'75, GSNB'80,'86, director of the Rutgers' Equine Science Center.

Dr. Malinowski will share photos from research being conducted by equine science faculty and students and talk about horse health and well-being, enviornmental stewardship, and the center's work to preserve and improve New Jersey's horseracing industry.

Event Details







.ab Notes - Williams

From The Lab:

Integrating Crabgrass into Cool-Season Grass Rotational Grazing Systems

THE TOP 5 TAKE-A-WAYS



Greater yields were achieved through monoculture establishment of crabgrass vs. interseeding crabgrass into existing cool-season grasses.



Horses consumed cool-season grasses more vigorously than warmseason grasses. aintaining horses on pasture can be beneficial for financial and environmental sustainability of equine operations.

Providing pasture access can reduce costs associated with supplemental feeding as well as the potential for nutrient leaching which can occur when horses are confined in dry lots with concentrated manure accumulation and low levels of vegetative cover.

Horse health and well-being may also be positively impacted by pasture access, which provides more natural feeding conditions and promotes more voluntary exercise in comparison to confinement in stalls or dry lots.

However, cool-season grasses commonly utilized as pasture forages in temperate regions of the United States often undergo a period of low-productivity during hot, dry summer months, which is commonly termed the "summer slump". Reduced forage growth in the "summer slump" can lead to overgrazing and creates management challenges for horse producers.

In contrast to cool-season grasses, growth of warm-season grasses is most vigorous during this same "summer slump" period. Warm-season grasses have also been suggested as an alternative pasture forage source for horses in which lower dietary non-structural carbohydrate intake is recommended.

Researchers at Rutgers University evaluated an integrated grazing strategy that incorporated Quick-N-Big crabgrass into cool-season grass rotational grazing systems. Although common crabgrass, a warm-season annual, is traditionally thought of as a weed, high summer yields have been reported for improved forage crabgrass varieties in other regions of the United States.

This study evaluated pasture production, forage nutrients, and grazing preference. It demonstrated that crabgrass integration did improve pasture production during the "summer slump". Researchers also tested establishment method for the crabgrass, finding that monoculture crabgrass establishment produced 61% greater yield than cool-season pasture grass, but interseeding crabgrass into existing cool-season grasses did not produce similar yield increases.

The Quick-N-Big crabgrass was low in NSC, and thus may serve as potential source of pasture forage for horses where dietary NSC levels are of concern, but NSC also remained below 10% for cool-season grasses during the "summer slump".

Additionally, crabgrass integrated grazing did provide adequate nutrition to maintain horse body condition, but there were no differences with horses maintained in a traditional cool-season rotational grazing system. Therefore, the primary benefit of integrated rotational grazing is more likely to be the increased forage yield rather than limiting NSC intake of grazing horses.

Finally, this study assessed grazing preference, finding that when horses were assessed in experimental small plots, as is common practice in equine grazing research, horses spent less time grazing crabgrass in comparison to cool-season grass.

Conversely, when horses were evaluated in a full pasture setting under normal grazing management conditions using remote automated monitoring technology, grazing time did not differ by forage. The chewing rate was greater, however, when horses were grazing cool-season grasses, indicating greater grazing vigor when consuming cool-season grasses vs. crabgrass.

For more information about our studies on crabgrass integration into traditional cool-season grass rotational grazing systems, we welcome you to join us for the Rutgers Equine Science Center's Evening of Science and Celebration on Thursday, November 11, 2021.

You can learn more about the event on the Page 12 via the story and flyer, and you can register for this virtual event here: *https://go.rutgers.edu/Evening2021*.

#3

Crabgrass integrated grazing produced greater summer pasture yields than traditional cool-season grass rotational grazing systems.



Non-structural carbohydrates (NSC) in Quick-N-Big crabgrass were low, but NSC in cool-season grasses also remained below 10% in cool-season grasses during the "summer slump" when both forages would have been available for grazing.



Integration of Quick-N-Big crabgrass provided adequate nutrition to maintain horse body condition; body condition did not differ in horses maintained in integrated vs. traditional cool-season grazing systems.



The 2021 Evening of Science & Celebration Is Almost Here he Rutgers Equine Science Center will celebrate another wonderful year of scientific accomplishments at its annual "Evening of Science & Celebration" virtually on Thursday, November 11th.

Dr. Sarah White-Springer from Texas A&M University will present the keynote titled "The Mighty Mitochondria: The Importance of Muscle Health for Optimal Equine Performance."

Dr. White-Springer is an Assistant Professor of Equine Physiology in the Equine Section of the Department of Animal Science. Dr. White-Springer's main passion is discovering means by which to improve performance and reduce injury in equine athletes. Her primary focus is mitochondrial adaptations to diet and exercise, and skeletal muscle bioenergetics.

In addition to her academic pursuits, Dr. White-Springer is an avid equestrienne, competing in upper level dressage with her own mare.

Dr. Malinowski will present on the accomplishments of the Equine Science Center over the last year.

Skylar Cooper, a member of the 4-H Horse Program, will be giving a presentation titled "Horses, Donkeys, and Zebras – Oh My!"

Dr. Jennifer Weinert-Nelson and Ph.D. Candidate Ellen Rankins will present on their research from the last year. Dr. Weinert-Nelson's recent doctoral work, which she just defended, will focus on pasture research, and Ellen will present on her equine assisted activities for veterans with PTSD research project.

The "Gold Medal Horse Farm" Award will be awarded, honoring an equine operation that uses environmental best practices to run a successful operation.

Finally, the "Spirit of the Horse" Award will be presented to Assemblyman Ronald S. Dancer for all of the work that he has done over the years to better the equine community in New Jersey. To register click on the flyer on the next page or go to:

https://go.rutgers.edu/Evening2021 .

A Virtual Evening of Science & Celebration

PRESENTED BY THE EQUINE SCIENCE CENTER

Thursday, November 11th, 2021 6:00pm to 7:30pm



Keynote By Dr. Sarah White-Springer

From Texas A&M University

"The Mighty Mitochondria: The Importance Of Muscle Health For Optimal Equine Performance"

Presentations

Welcome & Equine Science Center Update

NJ 4-H horse Project Presenter Skylar Cooper "Horses, Donkeys and Zebras, Oh My!"

Keynote Address

Research Updates

Awards

The Gold Medal Horse Farm Award

The Spirit of the Horse Award Presented To Assemblyman Ronald S. Dancer

f facebook.com/RutgersEquineScienceCenter

instagram.com/ruequinescience

twitter.com/RutgersESC

pinterest.com/RutgersESC



This event highlights the Equine Science Center's work in advancing equine health, horse management practices, and solutions to equine industry issues.

Event is completely free of charge. To register, please go on-line to https://go.rutgers.edu/Evening2021



Using Heart Rate To Understand Co-regulation

he Rutgers Equine Science Center's research project entitled "Human-Horse Co-regulation In the Context of Equine Assisted Activities" is in full swing as you read this.

Veterans with post-traumatic-stress disorder (PTSD) are visiting Special Strides, one of the Center's research partners, on a weekly basis to interact with the horses and learn horsemanship skills. Upon their arrival at Special Strides, veterans are outfitted with special equipment that allows the researchers to monitor and record several physiological responses. The horses are outfitted with this same equipment prior to the veterans' arrival making simultaneous measuring of the same variables in the veterans and horses possible.

One of the pieces of equipment placed on the veterans and horses is a telemetric ECG unit or

electrocardiogram unit. This unit consists of a set of four electrodes that are placed on the veteran's or horse's ribcage.

These electrodes are connected to leads (or wires) which run into the telemetric transmitter unit. This setup allows for the detection and recording of the electrical signals generated by the heart muscle as it pumps blood through the body.

The signal is transmitted and recorded on a device (such as a laptop) via a Bluetooth connection. This wireless transmission is what makes these units telemetric units and allows data to be recorded without wires running from the electrodes to the device displaying the data.

Each time the heart contracts it pushes blood out into the arteries, beginning its journey through circulation. These contractions of the heart muscle result in a change in the electrical charge in the muscle cells, an event known as depolarization.

Changes in electrical charge are detected by the ECG unit, resulting in the familiar ECG trace where each heartbeat is represented by a peak in the signal.

The number of heartbeats recorded each minute can give researchers information about the state of the animal or human.

Stress of any sort – physical and psychological – usually causes the heart rate to increase.

A common example would be exercise. As you begin exercising, your heart rate increases to meet the greater energy and oxygen demands caused by the stress. The same thing happens under conditions of psychological stress.



During the 2016 research study where Dr. Karyn Malinowski conducted a 5 session trial looking at the stress level of horses during equine assisted activities for veterans with PTSD, electrocardiogram units were also used. Dr. Ric Birks (pictured above) showed students how to attach the ECG units' electrodes to the horses, placing sponges on top of them to increase connectivity.

If you think back to a time when you were nervous, you'll probably recall your heart beating faster than normal.

In this research project, the researchers are interested in investigating whether co-regulation of the horse's and veteran's heart rate occurs.

Co-regulation refers to the tendency of two biological systems, in this case the horse and veteran, to synchronize over time.

If this phenomenon is present in the humanhorse interaction, the heart rate of the veteran would be expected to drop as the horse's heart rate decreases and vice versa.

In addition to providing the heart rate, the data collected with the ECG units can be used to derive heart rate variability or HRV of the horse and human.

HRV is a measure of the amount of variability in the amount of time between each successive heartbeat. An individual with low heart rate variability would have heartbeats which are very evenly spaced in time (i.e. one second between each heart beat).

An individual with high heart rate variability would have heart beats which are unevenly spaced across time (i.e. one second between two heartbeats, three quarters of a second between the next heartbeats, and so on).

HRV is dynamic and is primarily controlled by the autonomic nervous system. The autonomic nervous is horses and humans has two divisions – the sympathetic and parasympathetic.

The sympathetic system takes over during periods of stress and is responsible for things like an increased heart rate and directing blood flow away from the digestive organs.

The parasympathetic system is active during periods of rest and is responsible for things like a slowing of heart rate and directing blood towards the digestive organs.



Ph.D. Candidate Ellen Rankins places the leads of an electrocardiogram unit or ECG unit on the control subject during a pre-testing session.

These two systems always work in tandem with one another rather than simply being turned on or off. The balance between sympathetic and parasympathetic activation can be estimated from HRV.

As with heart rate, changes in HRV are expected to be synchronized between the veterans and horses (if HRV increases in one, it should increase in the other).

These same variables are also being measured during human-human interactions before the veterans begin their time at Special Strides.

The veterans are matched with non-veteran participants for interaction tasks where heart rate and HRV are recorded.

Heart rate and HRV during these interaction tasks will then be measured at the end of the veteran's eight week participation in the equine assisted activities program.

The synchronization between the veteran and non-veteran pairs is expected to increase following the eight week interaction.

While the research project is underway, we are also still enrolling participants. If you or someone you know would be interested in participating as a veteran or non-veteran participant, please contact the study coordinator, Ellen Rankins, by phone (848-932-3761) or email (rutgerseaat@njaes.rutgers.edu).





TGERS | eIRB

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EFFECTS OF EQUINE ASSISTED ACTIVITIES ON VETERANS WITH POST-TRAUMATIC STRESS DISORDER RESEARCH STUDY



HELP OUR VETERANS

Are you a male combat veteran? Are you a non-veteran male who would like to help veterans?

The Equine Science Center is looking for both veteran and non-veteran males between the ages of 18 and 75 to participate in a research study on the effects of equine assisted activities on veterans with PTSD.

Study Participants will be compensated!

For More Information Contact Ellen Rankins, study coordinator, at: (848)-932-3761 or RUTGERSEAAT@NJAES.RUTGERS.EDU

*For the most accurate assessment, only male combat veterans will be considered for inclusion in the study in order to reduce variability in the measured variables including hormones that differ between males and females.



THE!

Do you have any festive pumpkins decorating your home? Lord Nelson hopes you do! He'll fill you in on what to do with your pumpkin this year when it reaches the end of its festive lifespan.

Check out the latest Lord Nelson's Blog for some inspiration in decorating your own pumpkin!

We'd love to see the finished product! Share a picture on social media and tag us using #RUESC.







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