

RUTGERS UNIVERSITY

EQUINE SCIENCE QUARTERLY



From Our Stable To Yours
Spring 2022

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Hartmann Honored With Staff Excellence Award



The Junior Breeder Livestock Symposium Returns To Cook Campus For Live Event!

The Junior Breeder Livestock Symposium returned to Rutgers University in the traditional in-person format for the first time since 2019.

After a two year absence due to Covid-19, participants were excited

to return to campus on Saturday, March 26th for a fun filled day.

Over 170 participants joined for hands-on workshops in Equine, Large Ruminant (Cattle), Small Ruminant (Sheep & Goat), Swine, Poultry, Rabbit, Cavy (Guinea Pig), Small

From The Clubhouse



We are so excited to see everyone in person at Ag Field Day at Rutgers Day this year! We look forward to giving out some special items to those who visit us!

Dear Friends,

Looks like spring is finally here! Now if it ever stops raining and our fields start to dry up, we might be able to take our four-legged steeds out for a nice hack. The end of the spring semester is fast upon us and our wonderful students will be leaving us for a well-deserved summer break.

I had the pleasure of teaching in Dr. Zama's Careers in Animal Science class as well as Dr. Jesse's Intro to Animal Science class.

Since our last newsletter the Center's faculty, students, and staff have been busy offering educational programs both live in-person and virtually.

We held our first in-person event on Saturday, March 26 when we hosted the Department of Agriculture's Jr. Breeders Symposium. We had over 170 attendees in total with over 50 youth attending the equine track.

We were finally able to give out our "new" Equine Science 4 Kids activity book and had great fun interacting with the youth who designed a best management horse farm with tiles placed in a grid on the wall in the Equine Exercise Physiology Lab.

We were honored to have a very special guest, Rutgers University President Jonathan Holloway, who gave opening remarks to the crowd. President Holloway and his wife Aisling Colón were thrilled with the horse sports-packs and Equine Science Center jackets we gave them. To learn more about the event, see the cover story on [Page 1](#).

On April 8, we hosted the Big Ten Alliance at the Equine Exercise Physiology Lab. The Alliance is a group of university administrators who visit Big Ten schools each year. This was our second opportunity to host the alliance, and our students, Kyle Hartmann, and Jolee wowed the audience with their information and performance. See the story on page [Page 6](#).

Dr. Williams offered the Horse Management Seminar series virtually again on consecutive Tuesday evenings in February. To learn about the series, and where the archived recordings of the seminar can be found, please check out [Page 8](#).

On April 13, G.H. Cook scholars Sarah Florentine, Rhys Hagen, and Katie Eick successfully defended their theses. Find out about Ms. Hagen's project in our From the Lab section of this newsletter [Page 10](#).

I am pleased to announce that Mr. Hartmann was the recipient of the 2021 School of Environmental and Biological Sciences Staff Excellence Award. Kyle certainly is deserving of this honor and recognition. For the Full story visit [Page 12](#).

I hope to see you all on Ag Field Day at Rutgers Day on Saturday, April 30; and at our Summer Showcase which will be Wednesday, July 13.

Both of these events are always great fun and it will be nice to be able to reconnect with everyone in person! Information on both events can be found on the next page.

Best In Good Health,
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.



UMH Properties, Inc., is a real estate investment trust that owns and operates manufactured home communities in seven states throughout the northeast.

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



Boehringer Ingelheim Animal Health is the second largest animal health business in the world, with presence in more than 150 countries, and a significant presence in the United States, with more than 3,100 employees in places that include Georgia, Missouri, Iowa, Minnesota, New Jersey and Puerto Rico.

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 2022 EVENTS

Ag Field Day At Rutgers Day

Saturday, April 30, 2022

Red Barn - Cook Farm
Rutgers, The State
University of New Jersey
New Brunswick, NJ 08901

esc@njaes.rutgers.edu

Equine Science Center Summer Showcase

Wednesday, July 13, 2022

Red Barn - Cook Farm
Rutgers, The State
University of New Jersey
New Brunswick, NJ 08901

esc@njaes.rutgers.edu

2022 Hambletonian Continuing Education Seminar

Friday, August 5, 2022

Hilton Meadowlands Hotel
2 Meadowlands Plaza
East Rutherford, NJ 07073

Gordon@firstchoicemarketing.us

Evening of Science & Celebration

Thursday, November 10, 2022

Cook Student Center
Rutgers, The State University of NJ
New Brunswick, NJ

kylehart@njaes.rutgers.edu

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

The Junior Breeder Livestock Symposium Returns To Cook Campus For Live Event

Continued from Pg. 1



Rutgers President Jonathan Holloway, his wife Aisling Colón, and Executive Dean Laura Lawson joined Equine Science Center Director Dr. Karyn Malinowski and Associate Director of Research Dr. Kenneth McKeever for a tour of the Equine Exercise Physiology Laboratory before the day's events started.

(Pictured left to right: Jonathan Holloway, Laura Lawson, Kenneth McKeever, Karyn Malinowski, and Aisling Colón.)

Animals, and for the first time ever - Beekeeping!

The equine track included “An Introduction to Alternative Therapies: Massage/PEMF/Laser/Kinesiology Taping” by Mackenzie Laszczyk, from Impulsion Equine PEMF, LLC., who is certified in all these areas. Her session focused on a variety of alternative therapies, and their uses for horses so that they can feel their best, the most natural ways possible.

“Rehabilitation from Injury and Leg Care After Exercise” by Dr. Lizzy Leahy, from Foundation

Equine, went over tips for rehabilitating a horse after a leg injury and how to properly care for your horses’ legs.

“Wrapping legs: Tips and Practice!” by Dr. Carey Williams, was a huge success where attendees were able to learn about the correct uses for different kinds of leg wraps, and the proper techniques for each. Attendees were even able to practice their skills on the Rutgers University Teaching Herd (RUTH) horses!

The last session “Equine Science 4 Kids!” by Dr.



For more pictures from the event please visit: <https://go.rutgers.edu/2022JBLSPics>

Karyn Malinowski, Director of the Equine Science Center and the Equine Science Center staff (Ellen Rankins and Kyle Hartmann), unveiled the new ES4Kids! Equine Activity Book, and included an interactive game where attendees built their own pasture!

All attendees of this session left with their very own activity book!

This event is sponsored by the New Jersey Department of Agriculture Junior Breeder program in cooperation with Rutgers Cooperative Extension faculty and staff.



BIG Ten Academic Alliance Tours The Equine Exercise Physiology Lab

The Shared Governance Leadership group in the Big Ten Academic Alliance (BTAA) was hosted by Rutgers this year.

The BTAA is the athletic league's academic counterpart, made up of 14 top-tier research universities that together conduct \$10.5 billion in funded research annually.

Members of the group were given a private tour of the Equine Exercise Physiology Laboratory, which included a high-speed treadmill demo.

Undergraduate students, and Ph.D. Candidate Ellen Rankins, gave the tour group a brief overview of some of the recent equine related research that

the Equine Science Center has been working on over the last year.

Public Relations Specialist Kyle Hartmann gave an overview of the "Equine Science 4 Kids!" Program, showed off the new "Design Your Own Pasture" game, and provided them with horse sports-bags and the new activity book.

Special guests from Rutgers University included Ann B. Gould, Ph.D., Associate Vice President for Academic Affairs; Jon L. Oliver, Assistant Dean for Information Technology, and Chair of the Rutgers University Senate; and representatives from the other Big Ten universities.





The 2022 Horse Management Seminar:

“Recent Advances” In Health, Genetics, and Nutrition

Due to the in-person group meeting policies, and to make the event as convenient as possible for all attendees, the Horse Management Seminar was held in the virtual format again, hopefully to return to the in-person format next year.

Similar to last year, the seminar consisted of three Tuesday evening webinars on February 8th, 15th, and 22nd. Each webinar featured two speakers who focused on “Recent Advances” in Health, Genetics, and Nutrition.

Each evening focused on a specific topic area and ended with the ever popular “Ask the Expert Live” panel hosted by Dr. Carey Williams, Equine Extension Specialist and the Associate Director of Outreach for the Rutgers Equine Science Center, as well as the evening’s speakers.

Attendees had time to ask questions about the presentations and were encouraged to bring their own questions to the webinars based upon the subject area for that night.

Presentations included:

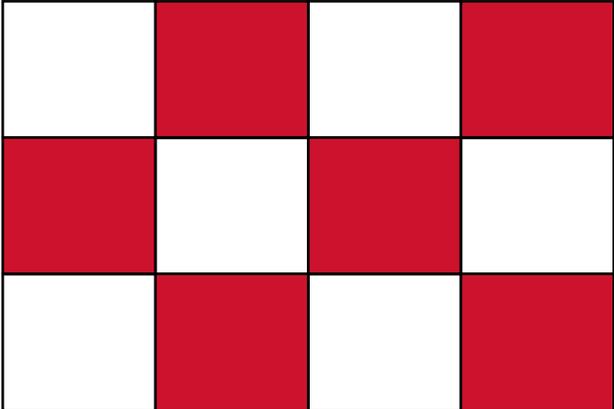
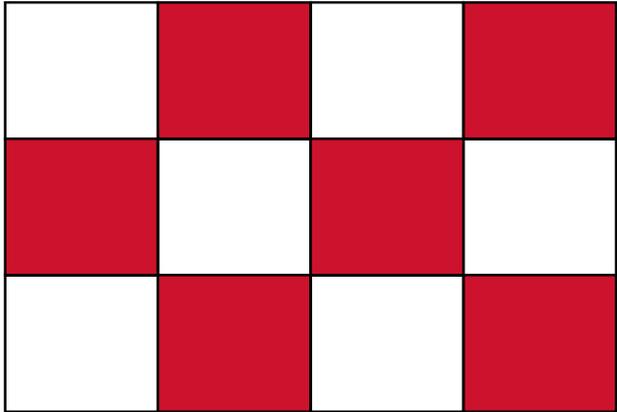
- “New Advances with Equine Diseases - Lyme, EHV, PHF, and more!” by Dr. Mark Crisman, DVM, MS, DACVIM, Senior Veterinarian, Equine Technical Services, Zoetis
- “What is new, tried and true with equine rehabilitation and conditioning?” by Dr. Sarah Gold, DVM, DACVSMR, B.W. Furlong & Associates
- “Genomics in the horse industry: discovering new questions at every turn” by Dr. Samantha Brooks, University of Florida
- “Equine Metabolic Syndrome: What is ID, why do we care and how do we manage?” by Dr. Amanda Adams, University of Kentucky
- “Nutrition and rotational grazing, metabolism and microbiome” by Dr. Jennifer Weinert-Nelson, USDA-ARS Post-Doc, Lexington, KY
- “New findings on CBD/Hemp in Horse Nutrition” by Anna Collins, Murray State University



**2022 Horse Management Seminar:
Recent Advances in Veterinary Medicine**

**Presented by Dr. Mark Crisman
and Dr. Sarah Gold**

Part of the 2022 Horse Management Seminar Webinar Series




**2022 Horse Management Seminar:
What's New in Equine Genetics and Health**

**Presented by Dr. Samantha Brooks
and Dr. Amanda Adams**

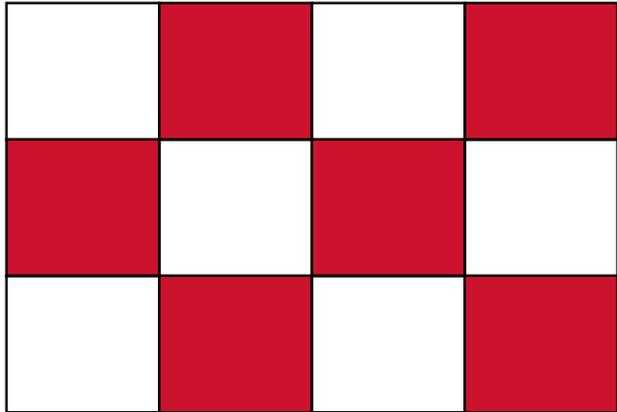
Part of the 2022 Horse Management Seminar Webinar Series



**2022 Horse Management Seminar:
Recent Advances in Equine Nutrition**

**Presented by Dr. Jennifer Weinert-Nelson
and Anna Collins**

Part of the 2022 Horse Management Seminar Webinar Series



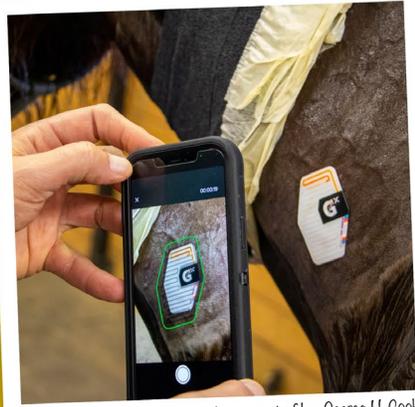
“Being able to invite guests to present virtually from around the United States has allowed our audience to hear from experts that would usually be restricted by travel expenses and other commitments,” said Dr. Carey Williams, Associate Director of Outreach at the Equine Science Center. “These experts have been able to join us from their

offices in places like Florida or Kentucky, bringing with them an expertise in topics such as equine rehabilitation, genomics, and rotational grazing.”

All recordings are now available on the Equine Science Center’s virtual archive in the “Library” section of the website listed under “**Multimedia**”, the location for all previously recorded webinars.

For all 3 recordings in one place, please visit: <https://esc.rutgers.edu/news/2022hmsrecordings>

For Release



Rhys Hagen conducting research as a part of her George H. Cook Scholars research project.

Lab Notes - McKeever

From The Lab:

"Testing the Efficacy of Sweat Chloride Measurement Patches on Horses"



THE TOP 5
TAKE-A-WAYS

#1

The use of electrolyte supplementation is seen commonly in the horse industry; however, studies have shown that excessive use can lead to an increase in the number of ulcers found in the mouth and stomach.

#2

The Gx Sweat Patch is designed to be a performance tracking sweat patch that would collect sweat through microchannels while athletes are exercising and provide feedback and rehydration recommendations in real time through the use of a phone application.

When a horse exercises (i.e. acute exercise or endurance training), it elicits a sweat response. Due to the hypertonic nature of a horse's sweat, this means that whenever a horse sweats it loses a large amount of electrolytes. Because electrolytes are responsible for several vital biological processes, it is of interest for horse owners to mitigate these losses. This is typically done through the use of electrolyte supplementation which is commonly seen in the horse industry. With these common practices come potential health risks as studies have shown that the excessive use of electrolyte supplementation can lead to ulcers found in the mouth and stomach.

With the continual use of electrolyte supplementation possibly leading to other health concerns, it is of interest in the equine community to circumvent severe electrolyte loss. In an attempt to assuage these concerns, this study focused on testing the efficacy of a chloride measurement patch, which is linked to a phone application that can provide real time chloride concentration and fluid volume measurements in comparison to traditional electrolyte sweat analysis methods (i.e. gauze and free-catch).

The Gx Sweat Patch is a patch created in collaboration between Epicore Biosystems and the Gatorade Sports Institution. This patch is connected to an application that can be downloaded from the

App Store and can give real time electrolyte and fluid losses pertaining to an exercise. If this patch is successful in yielding significant results then it could be used to help limit the excess use of electrolytes and even provide rehydration and dietary recommendations to help recover properly post-exercise.

Seven healthy, unfit standardbred horses were run for 20 minutes of acute exercise at a subset maximal speed of 5 m/s with a mean temperature of the treadmill lab being $19 \pm 1\text{D}$.

The gauze method and Gx Sweat Patch were placed along the brachiocephalic and ventral serratus cervicis muscle region for sweat collection. The free-catch sweat samples were collected in the ventral barrel region right behind the horse's surcingle. The data for all three methods were collected subsequent to the acute exercise.

The major finding of these trials was that there was no statistical association with the accuracy of the Gx Sweat Patch in comparison to the traditional methods. Qualitatively however, it was found that the dye agents in the patch reacted with the equine sweat in the same fashion that it would with human sweat. This indicates that with some experimental design and algorithm adjustments that there could be a potential future for this patch in the equine industry.

#3

It was found that there was a significant difference in electrolyte concentrations (Cl, Ca²⁺, K⁺) and glucose between the gauze and free-catch method. The free-catch method yielded higher concentrations than the gauze method.

#4

There is presently no device with the same function and purpose as the Gx Sweat Patch in the equine market, making it of value in the industry if the patch was adjusted to work accurately for horses.

#5

This study showed that there was a significant decrease in mean body weight through fluid and sweat loss post-acute exercise (from 504 ± 30 kg to 497 ± 27 kg).



Kyle Hartmann Honored At “Celebration of Excellence For The School of Environmental And Biological Sciences And The New Jersey Agricultural Experiment Station” With Staff Excellence Award

On November 19, faculty, staff and students attended the 27th and 28th annual Celebration of Excellence for the School of Environmental and Biological Sciences and the New Jersey Agricultural Experiment Station held at the Cook Student Center.

After the pandemic put a pause on fully celebrating the 2020 awardees, it was important to include them in this in-person event. Thomas Leustek, dean of Academic Programs, was the master of ceremonies.

This signature event acknowledges contributions that meet carefully-considered excellence criteria, including creativity, original work and ideas, innovation, effectiveness, integrity, leadership, impact, community engagement.

Kyle Hartmann was honored with the 2021 Staff Excellence Award during the awards presentation.

Mr. Hartmann joined the Equine Science Center staff in September 2014 as an Administrative Assistant, before his promotion to Public Relations Specialist in 2015.

Since his hiring in 2014, Mr. Hartmann continues to seek out new opportunities to increase visibility for the Equine Science Center, and set a course to rebrand Center materials to match the new website, which was launched in 2015.

Tracking the analytics of the site, and developed a new social media strategic plan that included the use of Facebook, Twitter, YouTube, and Pinterest, he utilized previous successes while at the same time working on rebranding some of these social media outlets to create a cohesive brand for the Center.

In 2017 the branding included developing separate brands for the Center's 15-year anniversary as well as a brand for "Horses 2017: The Best of the Best" a weekend long symposium which attracted 300 people to campus on March 18-19, 2017. This premier program at Rutgers was a huge success, as documented by an increase in knowledge gained by 99% of attendees, who also responded that they would most likely attend a similar event in the future (85%).

He has also taught some of the Adobe design programs to the Center's undergraduate Federal Work Study Program students, undergraduate "Studies in Animal Sciences" students, as well as the two Ph.D. candidates who have worked in the Center.

In 2020 the Equine Science Center published a new "Equine Science 4 Kids!" Activity Book which was created in collaboration with Mr. Hartmann, a Ph.D. graduate student, and undergraduate students working at the Center.

"Each of these design projects and rebranding initiatives have significantly enhanced the positive presence of the Equine Science Center, the School of Environmental & Biological Sciences, and the New Jersey Agricultural Experiment Station," says Center Director Dr. Karyn Malinowski.

"The Center is known for its outreach component, internationally, and its online presence, user-friendly materials, and top-tier educational events only enhance the image of the university, school and experiment station."



Mr. Hartmann also oversaw three major initiatives in spring/summer 2020-21 as Rutgers University went to an online learning format due to the Covid-19 pandemic.

The first program which was launched in April of 2020 was "Keeping Safe While Keeping Engaged", a 15-week initiative where every Friday the Center showcased educational materials from its archives organized by Mr. Hartmann. These included webinars, podcasts, fact sheets, etc.

In August 2020, the Center introduced "Equine Trivia Tuesdays" for kids ages 8-16. Hosted by Dr. Jennifer Weinert-Nelson (who was a Ph.D. Student at the time), Equine Trivia Tuesdays had participants from New Jersey, New York, and even Nevada.

Running from August through November, on alternating Thursday evenings, the Center introduced the "2020 Fall Webinar Series."

These lectures by faculty, students, and industry colleagues covered a broad range of equine-related topics; closed with a special "Ask the Experts"



webinar; and culminated on November 12 with the Center's first ever virtual "Evening of Science and Celebration".

"None of these initiatives would have been successful without the technical skills and tireless work of Kyle," Said Dr. Malinowski. "From the creation of a program or event, to all of the marketing and design, to finally running these events virtually, Kyle has allowed the Center to quickly transition to a virtual format seamlessly."

Mr. Hartmann also provides supervised and independent support for all aspects of the daily operation of the Center, including: planning and publicizing meeting/activities/events, coordination and execution of strategic communications for the Center.

This includes items such as press releases, newsletters, health bulletins, fact sheets and

website postings, and the Center's annual report.

He serves as first point of contact with/liaison between the public, Center, and School; works closely with Center support staff in discipline departments and other units; and supervises up to three independent study and five federal work study students each semester.

"One of my favorite jobs at the Center is leading the phenomenal team of student workers, undergraduate students, and Ph.D. students," said Mr. Kyle Hartmann.

"My most rewarding memory was seeing my very first student worker Carolayn Munoz graduate. She was the first student that I ever supervised, and to see her go from a first-year student just learning how to navigate the university, to a confident, award-winning, senior teaching and supervising other students was just really something to behold."

Mr. Hartmann is also responsible for the maintenance of donor and prospective donor information, and the research of donor and prospective donor prospects in coordination with the Vice Dean for Advancement & Associate Dean of Philanthropy and Strategic Partnerships.

He has also has increased collaboration between the Center and the Department of Animal Sciences via social media outreach to support both departmental and Center efforts. This includes working in collaboration with the Associate Director for Academics and administrative staff in the Department of Animal Sciences.

As part of his development work, Mr. Hartmann has orchestrated numerous hugely successful donor campaigns. This has included strategic donor initiatives (such as crowdfunding and Rutgers Giving Day), the creation of donor and development specific pieces (such as brochures and publications), and even the restructuring of how and when larger donors and recurring donors make their contributions, ensuring that their donation are making the most impact (either financially or in terms of recognition).

In June, 2018, during the “Month of the Horse” in New Jersey, Mr. Hartmann led a crowdfunding campaign with the new “one.rutgers” online donor portal. Before the launch of the campaign, it was decided that the crowdfunding goal would be set at \$5,000. With exactly one week left in the month, the Center hit the \$5,000 goal, and with a final campaign push, the Center raised 208% of its goal, with 50 donors contributing a total of \$10,407.

Mr. Hartmann has also made Rutgers Giving Day a cornerstone of the Center’s development strategic planning, and each year has developed strategic initiatives; complete with sample posts, pictures, hashtags, and branding.

Since 2019, year after year, the Center has raised over \$30,000 within the 24 hour Rutgers Giving Day period (even accomplishing this in 2021 during the Covid-19 pandemic).

With Mr. Hartmann’s plan implemented, the Equine Science Center has been successful each year at raising the most money of any unit at the Rutgers School of Environmental & Biological Sciences (SEBS) and New Jersey Agricultural Experiment Station (NJAES).



Ms. Carolayn Munoz pictured with Mr. Kyle Hartmann during Ag Field Day at Rutgers Day in 2019. Ms. Munoz worked with the Equine Science Center during all 4 years of her undergraduate career, and even came back during her first year of medical school to work for the Center.



Mr. Hartmann with the “Giving Day Team” in 2019, posing at a Student Giving event hosted by the Rutgers University Foundation.

(Pictured left to right - Carolayn Munoz, Kyle Hartmann, Moira Keihm (in the balloon), Leena Roy, Roz Beberman, Jennifer Weinert-Nelson, Ellen Rankins.)

Because of his talent in conducting fundraising efforts, Mr. Hartmann was asked to present a workshop titled “Fundraising during Covid-19” at the 2021 Equine Science Society meeting.

Besides all of his work for the Equine Science Center, Mr. Hartmann also continually gives back to the Rutgers Community at large.

He has served on hiring committees for not only SEBS and NJAES, but also for the Rutgers Division of Student Affairs.

He serves as an LGBTQIA+ Advocate, under the Center for Social Justice Education & LGBT Communities; a select group of faculty and staff who have been charged with giving “visible focus” in their respective departments to the issues of the LGBTQIA+ community by assisting students in resolving problems, promoting general awareness/

professional development, sponsoring programs to reduce transphobia and heterosexism, and making appropriate referrals for campus services.

And Mr. Hartmann even restarted/rebranded the LGBTQIA+ Rutgers Alumni Group, the Rutgers University Rainbow Alumni League, becoming the first Chair of the organization.

“Ask anyone at SEBS, NJAES, and in the equestrian community about the qualities of Kyle Hartmann,” says Dr. Malinowski. “In a short period of time he has truly become a member of the SEBS/NJAES family and has repeatedly demonstrated excellence in his work on behalf of the Equine Science Center. He is truly worthy of the SEBS/NJAES Excellence award in the category of Staff Excellence.”



Doris C. Murphy

Endowed Scholarship in Equine Science

The Equine Science Center has extended the application due date for the Doris C. Murphy Scholarship until June 1st, 2022 for this year.

The scholarship(s) will be awarded for the following academic year. Please see the application form on the right and scholarship details below.

Rutgers Equine Science Center and the Department of Animal Sciences at the School of Environmental and Biological Sciences at Rutgers, The State University of New Jersey, are pleased to announce the availability of financial assistance to undergraduate women who are New Jersey residents majoring in Animal Sciences with a concentration in Equine Science.

Scholarships will be awarded annually to full-time undergraduate Rutgers University students (including at least one incoming student).

Criteria include New Jersey residency, acceptance or current enrollment at the School of Environmental and Biological Sciences, academic merit, financial need, and demonstrated interest in equine science. Scholarships may be renewed annually with the approval of the scholarship selection committee.

The Doris C. Murphy Endowed Scholarship in Equine Science was created to honor the memory of a woman who loved animals. Ms. Murphy was born in Jersey City, moved to Dumont, and worked for the Ford Motor Company in Newark.

She and her husband had no children, and shortly before her death in 1998, she contacted her financial advisor, Kate Sweeney of Morgan Stanley 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 women students majoring in Animal Sciences with an equine science interest. Thus, the scholarship reflects Doris C. Murphy's love of animals and her deep interest in encouraging young women to complete their academic studies.

To Apply for the scholarship, please go to:

<http://bit.ly/DCMScholarship>

Non-structural Carbohydrates and Equine Warm-season Grass Pastures

A Fact Sheet by: Dr. Jennifer Weinert-Nelson, USDA-ARS Post-Doc; Caitlin Dolan, Student, Rutgers School of Environmental and Biological Sciences; and Dr. Carey Williams, Extension Specialist in Equine Management

Non-structural carbohydrates in equine feedstuffs are of concern for horse owners, particularly those managing horses that are obese or have a history of insulin resistance and/or pasture-associated laminitis. Limiting non-structural carbohydrate intake is a key component of nutritional management for these horses. This can be challenging for owners wishing to maintain their horses on pasture forage, hence there is a need to identify pasture forages that are lower in non-structural carbohydrates and less preferred by grazing horses.

What are Non-structural Carbohydrates?

Non-structural carbohydrates (NSC) consist of fructans, sugars, and starches produced and stored within growing plants. Sugars, including monosaccharides such as glucose and fructose as well as disaccharides such as sucrose, are designated as ethanol-soluble carbohydrates (ESC), and are the largest portion of NSC in most forages. Water-soluble carbohydrates (WSC) include the ESC sugars and longer, more complex chains of sugars called fructans. The NSC concentration of feeds includes both WSC and starch (which is not included in either the ESC or WSC fractions).

The NSC in feedstuffs is broken down within the equine gastrointestinal system, providing energy to support maintenance requirements of adult horses along with additional energy for those that are undergoing exercise, growth, or reproduction. Starch and sugars are primarily digested and absorbed in the horse's small intestine, resulting in increased blood glucose and insulin levels. Mammals, including horses, do not possess the digestive enzymes necessary for breakdown of fructans, which thus pass to the hindgut and are subject to fermentation by the microbiota in the cecum and large colon. Byproducts of bacterial fermentation can then be absorbed and used for additional energy by the horse.

Factors Impacting Pasture Forage Non-structural Carbohydrates

There are many factors that impact the concentration of NSC in pastures including the forage species and variety within species, time of day, seasonal growth patterns, and plant maturity as well as various environmental and management factors.

Species

Warm-season grasses (e.g. bermudagrass, teff, crabgrass) and legumes (e.g. alfalfa and clover) tend to be lower in NSC than cool-season grasses (e.g. orchardgrass, tall fescue, Kentucky bluegrass) of similar maturity, but variation in NSC exists within these forage types. For example, perennial ryegrass is often higher in NSC than other cool-season grass species (see below for more details).

Time of Day

Forage NSC is known to be highest in the late afternoon and early evening (approximately 4:00 to 8:00 p.m.) as sugars produced by photosynthesis accumulate in plants throughout the day; NSC is lowest in early morning hours (approximately 4:00 to 8:00 a.m.) when the sugars have been depleted by plant processes including growth in the hours when the sun is down. It should be noted that colder temperatures can alter these diurnal patterns in NSC concentrations.

Seasonality

The NSC in cool-season grasses are highest in the spring and lowest in the summer, with a subsequent rise in NSC documented during fall months until grasses enter winter dormancy. The NSC also decreases from first grazing in mid-summer through late summer and early fall for warm-season grasses.



Figure 1. A horse eating in a shady pasture, early in the morning when NSC would be at its lowest. Image courtesy of C. Williams.

RED BARN

APRIL 30

10:00AM - 4:00PM

Cook Farm
College Farm Road
New Brunswick, NJ

**AG FIELD DAY AT
RUTGERS DAY**

HIGH-SPEED HORSES

**Cook Farm/Red Barn
1:00PM & 2:00PM
Arrive 30 Min Early**

watch a horse run on a
high-speed treadmill and
learn about the research
and education conducted
by the center

2022

Contact Us:

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Equine Science Center

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Public Relations Specialist

Equine Science Center

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