RUTGERS UNIVERSITY
EQUINE SCIENCE QUARTERLY

Inside the Issue:

EquineScience4Kids!:NewActivity Book To Debut At Junior Breeders Livestock Symposium

There is never really a "quiet" time of the year for the Equine Science Center. When not doing field research, there is lab work. When not doing lab work, there are papers to write. And when not writing papers, there are community events to attend and seminars to host.

Ph. D. candidate Jennifer Weinert is researching integrated rotational grazing systems for horses that combine traditional cool season grasses with novel warm season grasses; Ph. D. student Ellen Rankins is researching the human-horse bond, especially as it pertains to the horses and humans that participate in equine assisted activities and therapies (EAAT); and state veterinary epidemiologist Dr. Leslie Seraphin recently lectured on the importance of equine biosecurity—how to prevent and control the spread of diseases—and gave a biosecurity tour of the Cook Animal Farm.

While research and lectures to students play a huge part in what the Equine Science Center does, the Center is equally dedicated to educating the public. This is accomplished through events like the Horse Management Seminar and annual Equine Science Center Stakeholder Meeting, as well as through publications like "Research Updates" and the Center's annual report.

These events and publications bring the research conducted at the Center to a user-friendly medium, and insures that information learned by conducting the research doesn't just get put on a shelf, and is actually distributed to constituents.

"But what about the constituents who are younger, the ones who might just be entering 4-H or are interested in horses but don't know where to go," said Kyle Hartmann, Public Relations Specialist at the Equine

Continued on pg. 4

RUTGERS
New Jersey Agricultural Experiment Station

From The Clubhouse

Wishing all of our friends of the Rutgers Equine Science Center a happy, healthy, and prosperous 2020.

Dear Friends,

I hope you all enjoyed quality time with family, friends and horses over the holidays and your friends at the Equine Science Center wish you the best for 2020.

Before the winter break I wrapped up teaching in my first formal 14 week course in 42 years! I agreed to team teach "Topics in Equine Science" with Ken McKeever and I had a blast! Ken and I tweaked the course to address topics important to horses and the equine industry other than solely focusing the topics to exercise physiology. We brought in outside speakers who addressed things like biosecurity; the equine microbiome; coping with death, palliative care, and euthanasia; and the wild horse and burro population. I truly enjoyed engaging with these intelligent young people who, for the most part, had little horse experience. Rutgers does attract the best and brightest!

As usual the Center is busy in the fall hosting and attending events. On October 16 we held our annual Stakeholder's meeting in conjunction with the monthly New Jersey Equine Advisory Board meeting. The stakeholder meeting is used to share highlights of the Center's work in the past year and to hear challenges impacting horse care and management and industry sustainability. We've already responded back to our constituents with information about dealing with a variety of challenges identified.

On November 14 our annual "Evening of Science and Celebration" showcased our own, Ken McKeever who lectured on the controversial subject of the use of furosemide in treating Equine Exercise Induced Pulmonary Hemorrhage. There was good attendance from the veterinary and racing communities. Thanks to Mid-Atlantic Equine Medical Center for sponsoring the event. Dr. Michael Fugaro received the "Spirit of the Horse" award and Fair Winds Farm received the "Gold Medal Horse Farm" award. For pictures from the event and to see our 2020 award winners, see the story on **Page 12**.

We were asked again by the NJ Association of Equine Practitioners to host a repeat performance of last year's ultrasound wet lab. The lab was conducted by Drs. Chope and Tenney from Tufts Cummings School of Veterinary Medicine. Attendees were impressed with Center facilities and students who volunteered for the event. Even our visiting scientist, Dr. Helio Manso pitched in! See pictures from the event on **Page 14**.

At the end of the year I published an article with colleagues in a special equine issue of the journal, "Sustainability". The article titled "The Evolution of Racehorse Clusters in the United States: Geographic Analysis and Implications for Sustainable Agricultural Development". We found that isolated, scattered registered stallions have largely disappeared, strengthening one or more core states that had an initially high percentage of stallions. The gainers and losers among previously core regions appear to be heavily influenced by state-level policies. To read the full article go to:

http://bit.ly/2020SustainabilityClusterStudy

I hope to see all of you at the 2020 Horse Management Seminar on Sunday, February 9. Carey Williams has assembled a group of experts to address the topic of "Racehorse and Sport Horse Care and Rehabilitation". Anyone who competes on the racetrack or in the showring should not miss this opportunity. Topics to be discussed can be found in "From the Lab" on **Page 10**. *For more information on the Horse Management Seminar see* **Page 9**.

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.

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

Upcoming 2020 Events

Horse Management Seminar

Sunday, February 9, 2020

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

esc@njaes.rutgers.edu

Junior Breeders Symposium

Saturday, March 28, 2020

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

carey.williams@rutgers.edu

Ag Field Day Part of Rutgers Day

Saturday, April 25, 2020

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

esc@njaes.rutgers.edu

Equine Science Center's Summer Showcase

Friday, July 17, 2020

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

esc@njaes.rutgers.edu

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

EQUINE SCIENCE 4 KIDS!

New Activity Book To Debut At Junior Breeders Livestock Symposium

(Continued From Cover Story)

Science Center. "For these young constituents we have a fantastic program called Equine Science 4 Kids!."

Originally developed in 2010, before Hartmann started at the Center, Equine Science 4 Kids! (ES4K) is an educational program geared towards those in grades 3 – 9. The program encourages kids to get involved in science, technology, engineering, and math (STEM) fields, using horses as a model.

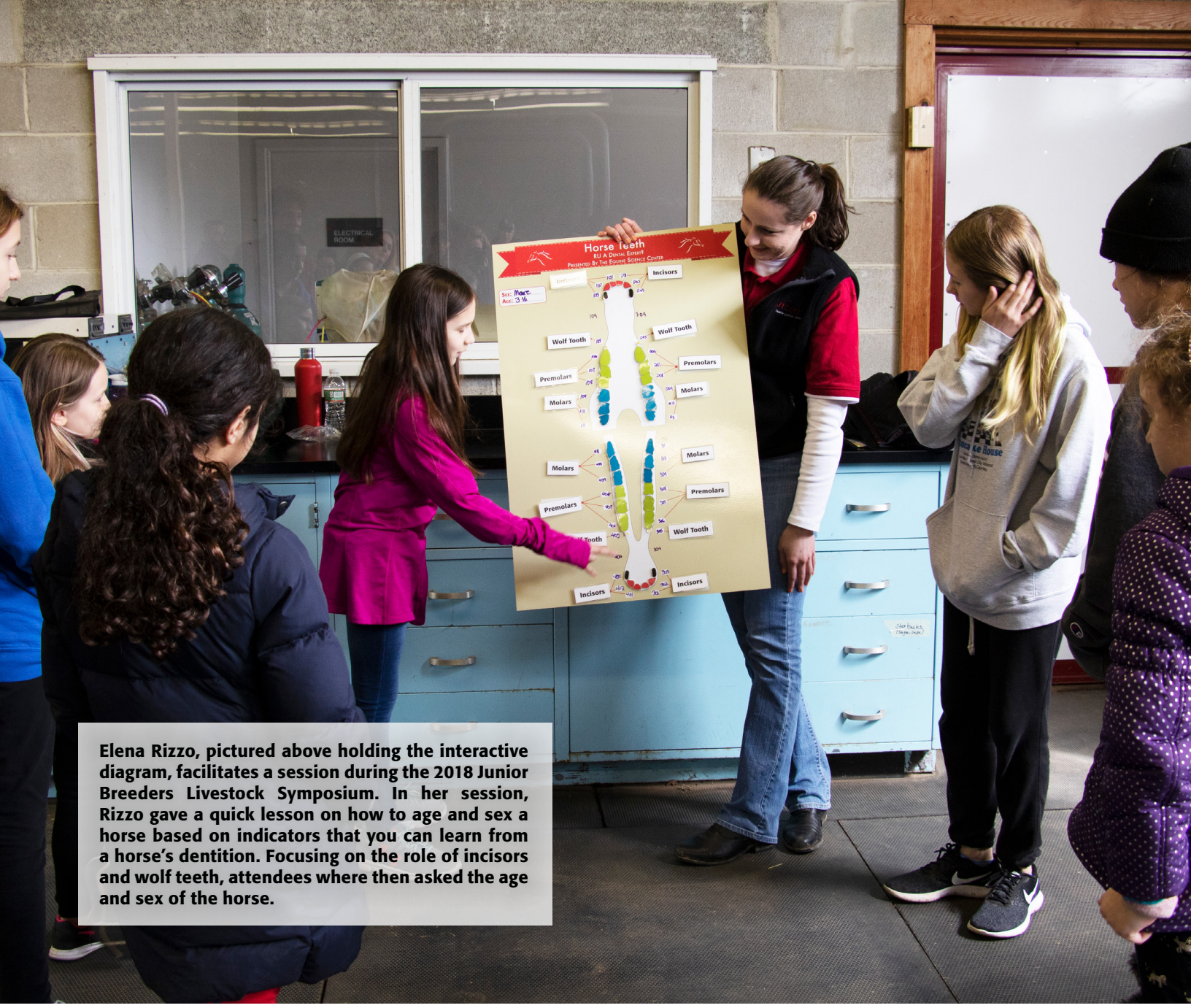
By developing hands-on, science-based activities and demonstrations, kids are able to better understand the science behind research taking place at the Center. The program was so well received that Center Director Karyn Malinowski presented the website version of ES4K; which includes a blog, game, and other electronic resources; to the New Jersey Department of Agriculture (NJDA) in 2011. The NJDA saw the program as a route for agricultural education and funded and promoted the program as a part of their educational resources geared towards younger constituents.

At public universities, youth components of programs can usually be seen coming from Cooperative Extension in the form of 4-H programs.

"I cannot say enough about the importance of engaging children and encouraging their interest and education in horses and science," said Weinert. "I also have first-hand appreciation for the role that Cooperative Extension plays in fostering this youth engagement and providing opportunities for learning and growth. I was a 4-H kid, and all of my early experiences and development of knowledge and skills in the world of horses were made possible by University of Wisconsin Extension programming."

In the case of ES4K, the program was developed by the Center with the New Jersey 4-H Horse program in mind. It was this demographic that was used as a gauge for success originally, and has helped to guide the program forward with each new component that is designed.

When Hartmann started in 2014 the program was successful, with both a web component, and an



Elena Rizzo, pictured above holding the interactive diagram, facilitates a session during the 2018 Junior Breeders Livestock Symposium. In her session, Rizzo gave a quick lesson on how to age and sex a horse based on indicators that you can learn from a horse's dentition. Focusing on the role of incisors and wolf teeth, attendees where then asked the age and sex of the horse.

activity book to engage the young equine scientists. But he was also interested in how to expand upon the program, looking for new ways to engage with these kids (and often their adult counterparts).

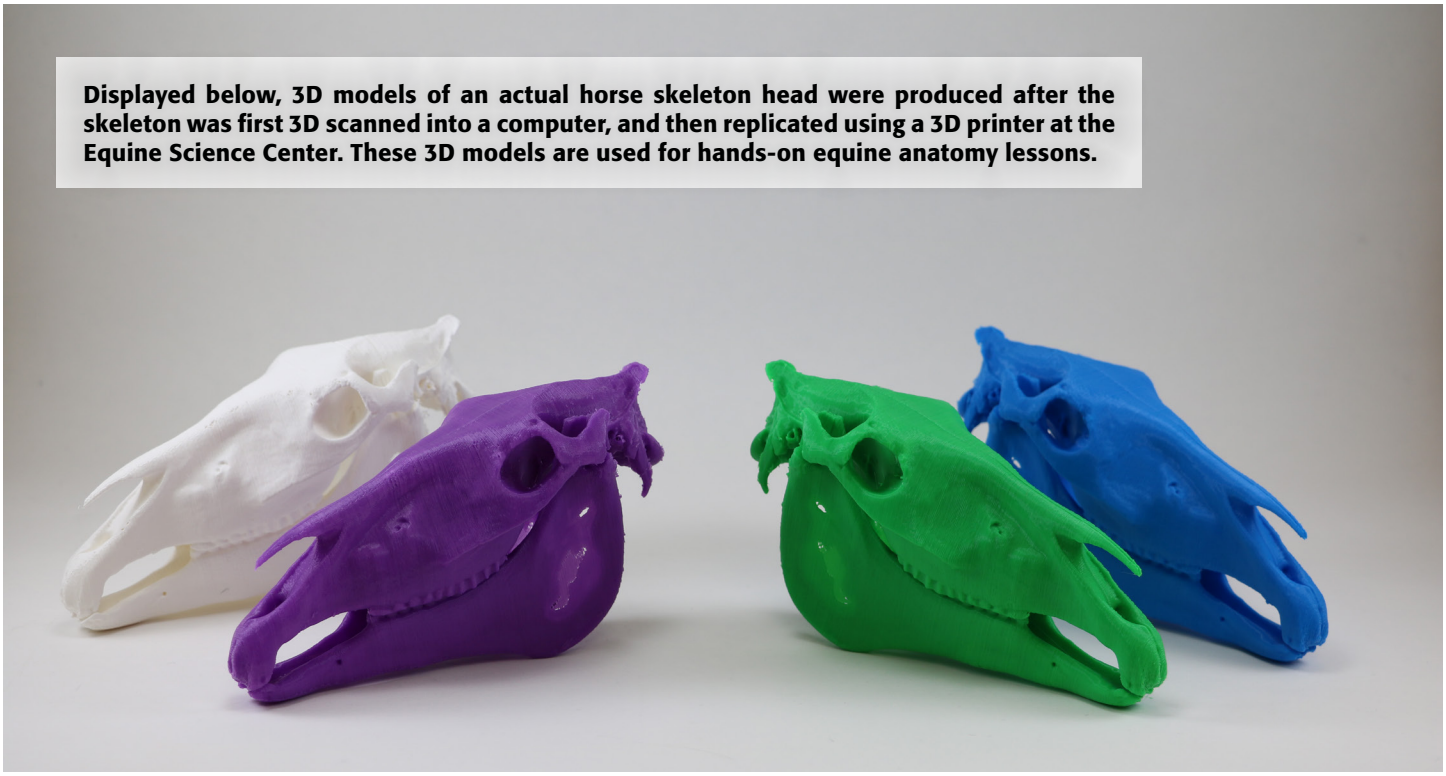
Creating the popular coloring "Horse Sportspack;" advocating for a 3D printer to print skeletal bones that kids can interact with; and working with Elena Rizzo to create an equine dentition activity entitled "Horse Teeth: RU A Dental Expert," Hartmann has worked with staff, students, and faculty to grow ES4K.

Rizzo, an alumnus of the Department of Animal Sciences and former staff member at the Center, was the first member of this new "team" recruited by Hartmann.

They started with the dentition activity, which debuted at the 2018 Junior Breeders Livestock Symposium to much excitement.

She brought the science to Hartmann's designs, and together they created a product that was both interactive and educational.

"Although "lecture" learning is traditional, it encourages the "regurgitation" of memorized information as opposed to logic analysis and reasoning," said Rizzo, now studying at Michigan State University to become a veterinarian. "The basis of interactive learning is to encourage student participation in the educational process.



Displayed below, 3D models of an actual horse skeleton head were produced after the skeleton was first 3D scanned into a computer, and then replicated using a 3D printer at the Equine Science Center. These 3D models are used for hands-on equine anatomy lessons.

This is especially important for children, because the activities keep them engaged and promote collaboration among peers. Interactive activities are invaluable because they encourage students to think critically and apply information to situations beyond what is presented in a lecture setting."

By 2018 though, the original activity book had become dated, and Hartmann wanted to create an updated version that would be comprised of different activities relating to the research currently being conducted at the Equine Science Center, provide children with a basic understanding of why this research is important, and present this education in a fun and interactive way.

The team drafted some outlines for what they wished to accomplish, and used other activity books from places like the Museum of Natural History and the Museum of the American Indian as examples of the types of activities currently being used for this age range. "There were general themes such as mazes, color by numbers, and solving riddles," said Rizzo. "I wanted to focus on activities that reflect important aspects of equine care, management, and science using the research being conducted at the Center."

In order to encompass a larger range of research topics, they added additional members to the team. Weinert, whose research focuses on pastures (and also has a background in equine anatomy), used her experience with theses topics to create specific activities in the book.

"We have members of our Equine Science Center team that have a less direct background and experience in the science and management of horses, but excel in communications and program development," said Weinert. "This perspective was invaluable as we identified how to best translate what can be complex topics into activities that are easy to understand, educational, and, of course, fun for youth who are interested in learning more about horses and horse management."

With Rizzo and Weinert leading the science side of the team, Hartmann had thought that all of the design aspects of the project would fall on him. While he ultimately compiled the book, he was thrilled that Weinert took on a larger role on the design side of the team.

Over the summer of 2018 Weinert self-tough herself Adobe Illustrator, creating graphics for

Designed and debuted in 2016, the "Equine Science 4 Kids!" Sportspack can be found at most Equine Science Center events, and all events where kids are the primary demographic. Community events, both on and off campus, usually include these bags as a give-a-way and provide an area where everyone is able to color in their own bag.

multiple components throughout the activity book.

"This was a great opportunity for me because I was able to learn and develop a whole new set of skills," said Weinert. "Youth programming offered by the Equine Science Center provides us a chance to share the work that we do here and create real opportunities for translating that work into knowledge, skills, and management practices that can be used by youth and their families."

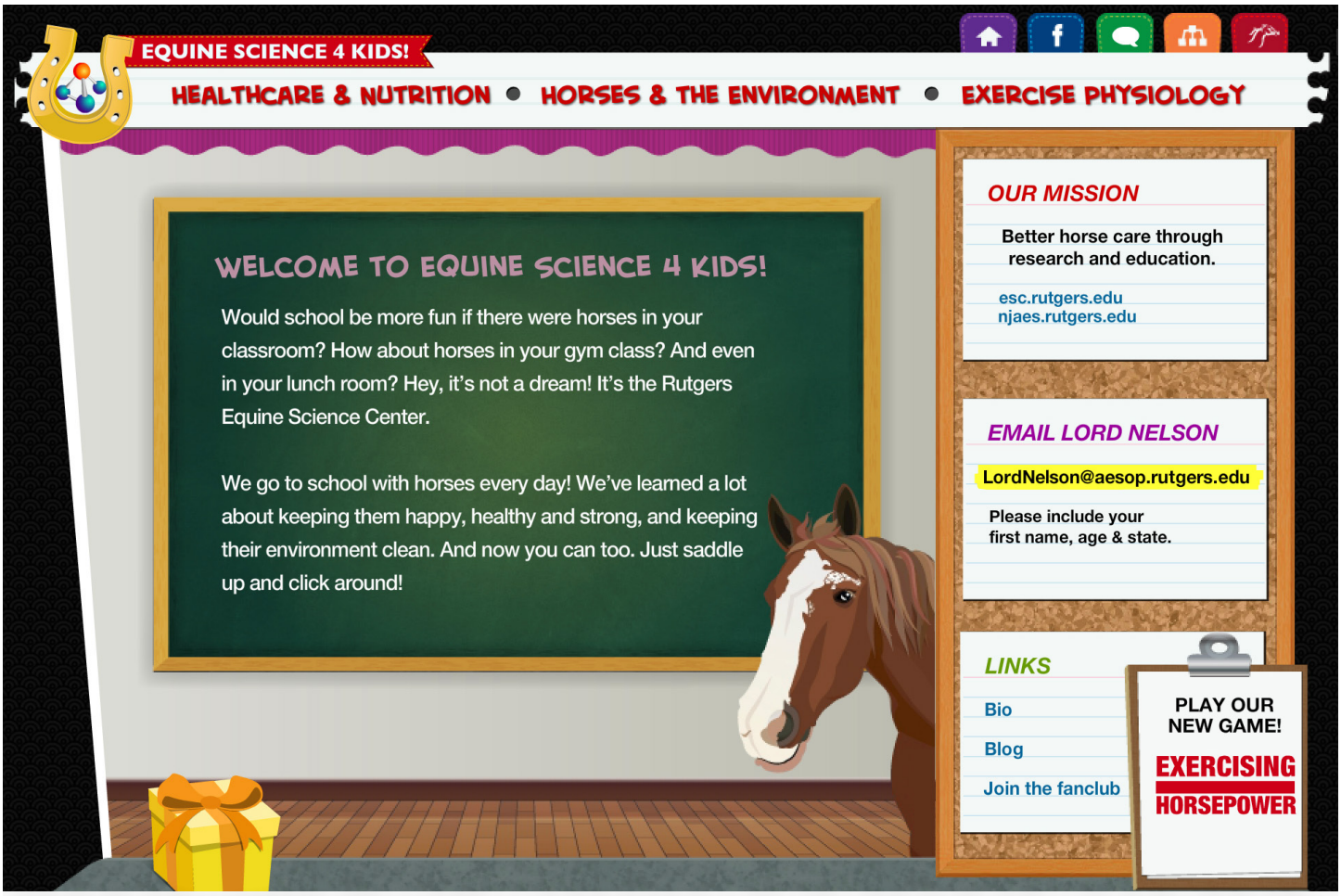
Like its predecessor, the new activity book encompasses interactive puzzles and activities to get young researchers engaged in equine science.

These young equine scientists will learn about biosecurity, equine assisted activities and therapies, rotational grazing and pasture management, and much more.

Educational picture and word puzzles will appeal to younger scientists-in-training, while equine-oriented high-school students can engage with an interactive anatomy lesson and pasture design activity.

The team looks forward to debuting the new activity book on March 28th, 2020 at the Junior Breeders Livestock Symposium.

"It is beyond rewarding to see excitement on the faces of children who have learned or experienced something new about an animal that they love! These programs also provide a connection with Rutgers University, as these youth will become the future leaders and scientists within the horse industry," said Weinert. "I once read a program evaluation where a child responded to a question about what they had liked best about that program by saying that they enjoyed learning all about horses and 'couldn't wait to go to Rutgers one day' when they got older."



The Equine Science 4 Kids!' on-line portal is a part of the "Kids Corner" section of the Equine Science Center's website. The section includes links to "Lord Nelson's Blog" and the 4-H Horse Program. You can visit the site at: esc.rutgers.edu/kids.

Rutgers Annual Horse Management Seminar

February 9th, 2020

Racehorse/Sport Horse Care and Rehabilitation

8:00 to 3:20 at the Rutgers Cook Campus Center

Topics Include:

Speakers From:

A full program and registration details, see:

http://bit.ly/2020HorseManagement

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Equine Science Center
Better Horsecare through Research and Education

For Release

Good Magic, winner of the 2018 Haskell at Monmouth Park. (Photo Courtesy of Bill Denver/Equi-Photo)

Collaborators

From The Lab:

Preview of the 2020 Horse Management Seminar: "Racehorse/ Sport Horse Care and Rehabilitation"

- Malinowski's Lab
- Collaborators from other Universities
- McKeever's Lab
- Horse Treadmill
- Williams' Lab

The Top 5 Take-A-Ways

#1 **Feeding for sports should consider getting all of the correct nutrients required for a high level of work, calorie source for the type of work required, and timing of feeding prior to (or during) an event.**

#2 **Rehabilitation should be performed under the continued guidance of a veterinarian and/or equine physical therapist. The basis for rehabilitation is an accurate diagnosis.**

The return to athletic performance after an injury can be a long and difficult process. Rehabilitation and physical therapy are paramount for human athletes, but are often underused or forgotten for equine athletes.

By promoting healing, alleviating pain, improving strength and mobility, and guiding reconditioning, rehabilitation allows the horse to return to work faster and with a more successful outcome. It is a holistic process that addresses the entire body, including the horse's nutrition and the rider/tack. Therapeutic modalities such as thermal therapy, laser, Pulse Electro-Magnetic Field Therapy, and shock wave; or integrative therapies such as chiropractic and acupuncture; can all be aspects of rehabilitation in addition to rest and controlled exercise.

Every horse and injury are different, and each sport has its unique physical demands, thus developing a personalized rehabilitation plan to return the horse to athletic performance is essential to a successful recovery.

The goal for this Horse Management Seminar is to bring leading veterinary and academic experts to discuss caring for the racehorse, managing the sport horse, rehabilitating horses, transitioning careers between race and sport, and feeding for different types of exercise.

Monitoring daily health and preventing poor performance issues is critical to ensure success in both Thoroughbred and Standardbred racehorses. Common injuries will be discussed as will which of these injuries, when treated, are recoverable for other activities, and the associated prognosis.

Athletic horses have different nutritional requirements than idle horses or those only in light work, but there are also differences in feeding management for horses in different competitive disciplines.

Events that require horses to be calmer and focused, such as western pleasure, hunters or dressage may still have higher calorie requirements for the work, but those horses may be better off consuming "cool" calories, such as those coming from fiber and fat.

Horses that need bursts of power – like racehorses, eventers, barrel racers, and show jumpers, are fueled by muscle glycogen. Therefore, they should have plenty of soluble carbohydrates (starches and sugars) to support glycogen synthesis.

Timing of feeding can also influence the fuels available to the muscle for work, such that grain/concentrate feeding should be typically fed at least 4 hours before an event. In contrast, horses that do endurance need a constant supply of fuel, and should be fed as often as possible, in particular, during rest stops.

To learn more, visit ***Page 9*** to register for the event!

#3

When working to assess a horse, and gain a proper diagnosis, the rider and tack must be assessed because they alter the horse's gait and posture.

#4

Rehabilitation includes superficial heating and cooling agents, manual, electrical and mechanical therapies, mobility and strength exercises, podiatry, nutrition, and integrative therapies such as chiropractic and acupuncture.

#5

A rehabilitation program takes into consideration the horse's injury, age, temperament, and sport.

Evening Of Science & Celebration

On November 14, 2019 the Rutgers Equine Science Center hosted the 29th annual "Evening of Science and Celebration" in New Brunswick. Following dinner, Skylar Cooper and Morgan Wordleman gave their Team Presentation titled, "Fly Be Gone!"

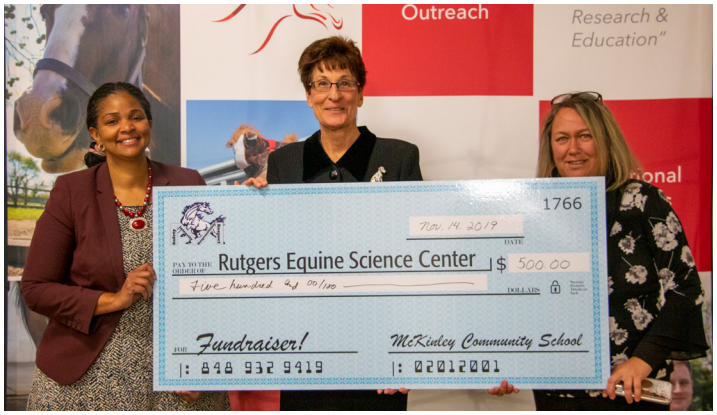
The keynote address was given by the Center's very own Kenneth McKeever, Ph.D., Professor of Animal Sciences at Rutgers University.

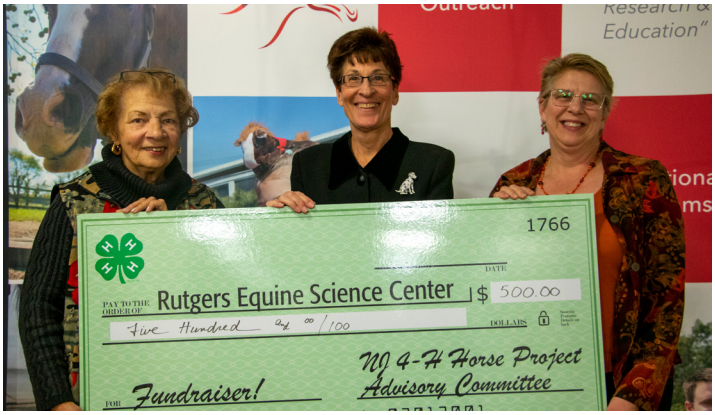
He presented "A New Treatment for EIPH: The Effect of PD Inhibitors on Pulmonary Artery Pressure in Horses." Guests included representatives from: the Standardbred Breeders & Owners Association Of New Jersey (SBOANJ), the New Jersey Racing Commission, Darby Development, LLC., and the Thoroughbred Horsemen's Association of New Jersey.

After the keynote, Assemblyman Eric Houghtaling gave remarks highlighting the importance of the Equine Science Center, and the New Jersey Agricultural Experiment Station. This was followed by the presentation of the Gold Medal Horse Farm Award, which went to Fair Winds Farm, in Cream Ridge owned by Mark Mullen.

Jennifer Weinert, Ph.D. candidate, gave a research update titled "Warm Season Grasses and Grazing Horse Metabolism" which looked at the effects of using both warm and cool season grasses on the same area of pasture.

As she analyzes the data, she will be looking at things like: how the grass grew depending on season, did this increase the grazing period of specific pastures, and was there a preference by the horses towards a certain grass.





Following Jen's update, several members of the New Jersey 4-H Roundup team which just returned from national competition were honored with certificates.

This was followed by a check presentation from the New Jersey 4-H Horse Project Advisory Committee, and from McKinley Community School. McKinley, a local school in New Brunswick, has adopted one of the Center's research mares, Janie, as a school mascot.

In doing so, they decided to raise money to sponsor her through the Center's "Horse Hero Program," and over the last year raised $500.

The evening concluded with the presentation of the "Spirit of the Horse" award. Dr. Michael Fugaro, owner and operator of Mountain Pointe Equine Veterinary Services located in Long Valley, New Jersey received the 2020 "Spirit of the Horse" award for his lifelong commitment to horse care and education.

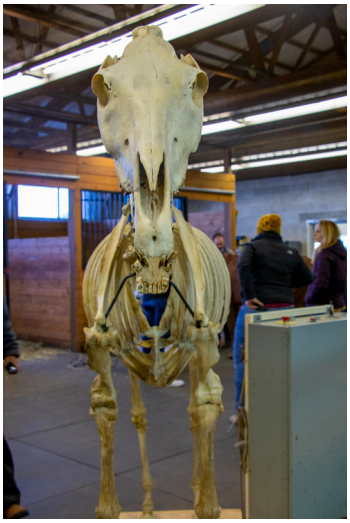
Equine Science Center Hosts New Jersey Association of Equine Practitioners Wet Lab

The Equine Science Center hosted the New Jersey Association of Equine Practitioners (NJAEP) on November 16, 2019.

This marks the second year that the NJAEP has hosted their wet lab seminar at the Rutgers. Drs. Kate Chope and Wade Tenney from Cummings School of Veterinary Medicine at Tufts University lead the instructions and didactic teaching for the 13 participating veterinarians.

The continued partnership has allowed veterinarians from throughout the state to get hands on experience, learn new techniques, or share their knowledge and techniques with other vets; and at time same time has provided the NJAEP with a central location for their members to gather. Rutgers' student volunteers were also able to get hands on experience, learning directly from the veterinarians.

Overall, attendees were pleased with the event and location, and stated that they look forward to holding other continuing education events at the Equine Science Center in the future.







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