RUTGERS UNIVERSITY EQUINE SCIENCE QUARTERLY



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Going Virtual To Bring Constituents Knowledge



s Rutgers University announced that all fall events would be required to be held virtually, the Equine Science Center started discussions on how to serve its community.

"We wanted to stay connected with our constituents," said Kyle Hartmann, Public Relations Specialist at the Equine Science Center, "so we immediately started to think about ways to turn our events virtual, and how to add additional events for our various demographics."

An early virtual event was the Equine Science Center's Summer Showcase. Held virtually for the first time this past summer, the event offered virtual versions of all of the events that would typically take place.

The Center continued to build on the success of this trial run, and

From The Clubhouse



Dear Friends,

During these trying times, during the pandemic, I want to reach out to say that I hope you and your loved ones are healthy and safe. We all know someone who has been sickened by COVID-19 and the impact that this disease has had on friends and families around the world. I find the isolation to be most devastating and am super appreciative of my own horses at this time. Hopefully you all have found some peace in your four-legged friends (dogs and cats included!) as well.

Covid-19 made all of us at the Equine Science Center rethink about how we carry on our business and stay connected with people like you! All of our research came to a halt, in person events were canceled, and our undergraduate student population is minimal, at best.

As mentioned last time, our Summer Showcase was held virtually and we have stayed connected with many of you through a series of webinar meetings. During the month of August we held "Equine Trivia Tuesdays" for youth ages 8-16. These programs led by Jen Weinert and Kyle Hartmann used the game platform "Kahoot" to test the knowledge about the care and management of horses by our attendees. These were highly successful, indicated by the repeat turnout each week.

One thing that I've learned from remote learning is that people can participate in programs from all over the world and they don't have to drive to New Brunswick! "Equine Trivia Tuesdays" had participants from as far away as Las Vegas, Texas, and Saratoga Springs. Topics ranged from biosecurity to equine anatomy. Great fun was had by all and prizes were awarded to the top gamers each week.

Beginning in August the Center began a bi-weekly webinar series which is ongoing. I kicked off the series with a lecture on Thursday, August 13 about the care and management of the older horse.

This was followed by lectures by Drs. Ken McKeever and Carey Williams and some friends of the Equine Science Center. For instance, Dr. Seraphin from USDA-APHIS gave us a great overview of biosecurity on horse farms and equestrian events and Ed Wengryn, from New Jersey Farm Bureau, talked about Farmland Preservation and Right to Farm issues to ensure a sustainable equine industry.

These will continue through October on alternate Thursday evenings at 7PM. On November 5, we will bring back an "Ask the Expert" panel to answer your questions live. To see the full story about our virtual events, visit **Page1**.

The series will end on Thursday, November 12 when we present our "Evening of Science and Celebration" virtually beginning at 7PM. I will present the lecture that I gave in July to veterinarians from around the world titled "Equine Welfare: a New World for the Equine Athlete".

A special guest will be joining us from the University of Kentucky's Gluck Equine Research Center. Dr. Allen Page will present his latest research about the question, "Can a simple blood test predict catastrophic racing injuries in horses?" This is one you don't want to miss! We also will be presenting the Gold Medal Horse Farm and Spirit of the Horse awards. For information on this event check out the flyer on **Page5**.

As we approach holiday time, please consider making a gift to the Equine Science Center in support of our ongoing research. This year our fundraising has focused on the work of Ph.D. candidate Ellen Rankins and her project, "Co-regulation of Horses and Humans – Impact of Equine Assisted Activities and Therapies on Veterans with PTSD". The Center will be participating in a Rutgers Crowd Funding effort for the months of November and December. Check our **Facebook** in the coming weeks to learn more.

In closing I want to wish you all the best this holiday season. We will get through this crisis together. Stay safe, stay well, stay engaged, and especially, enjoy your horses! Yours in "Better Horse Care through Research and Education".

> 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:

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



Going Virtual To Bring Constituents Knowledge

Continued from Pg. 1

started to plan other virtual events.

The "Equine Trivia Tuesdays 4KIDS!" trivia nights took place each Tuesday in August and provided a fun way for the Center's young equine scientists to stay engaged and learn some new equine facts. Hosted virtually, the event saw participants from across the United States. From New Jersey to New York, and from Texas to Nevada, kids joined to learn about topics ranging from equine nutrition, to equine behavior.

"Even I learned something," says Center Director, Karyn Malinowski. "Our Ph.D. Candidate Jennifer Weinert did a fantastic job of including questions for the wide range of age groups that we had. We had students from grade school all the way up to high school."

Due to its success, the "Equine Trivia Tuesdays 4KIDS!" program will be brought back at some point this school year. It is temporarily on hold though as the Equine Science Center is running the "2020 Equine Webinar Series."

Every other Thursday the Center has invited a guest speaker to give a short presentation on a specific equine topic, followed by a question and answer session. So far, the presentations have included topics covering the history of horses in research, biosecurity, and the aging horse just to name a few.

The series will culminate with an "Ask the Experts Live!" webinar where participants will be able to ask any equine related question to the panel of experts. Panelists include a veterinarian,



Brian Colquhoun, DVM, will give the next presentation of the "2020 Fall Equine Webinar series," on the "Use Of Alternative Therapy For Horses: Acupuncture" on Thursday October 22.

an expert on manure management, an equine nutritionist and pasture management specialist, an equine exercise specialist, and an expert on equine aging. They are also knowledgeable in many other equine related topics, and hope to cover a wide range of questions throughout the night.

Finally, the Center's last planned virtual event of 2020 (as of now) will be the Equine Science Center's 2020 "Evening of Science & Celebration." For the first time ever, attendees will join virtually for a night of Center updates, keynote presentation on "Equine Welfare: A new World For Equine Athletes," and supplemental presentation on "Can We Use A Blood Test To Predict Catastrophic Racing Injuries In Horses?".

For a full list of all of the virtual events that the Center is offering, and to register and learn more, please go to: https://esc.rutgers.edu/outreach-events/



The Equine Science Center Presents:

A Virtual Evening of Science & Celebration

Thursday, November 12th, 2020 7:00pm to 8:30pm

Keynote By Dr. Karyn Malinowski

"Equine Welfare: A New World For Equine Athletes"

Presentations

Welcome & Equine Science Center Update

Keynote Address

Guest Speaker

Award Presentations

Guest Speaker

Dr. Allen Page



"Can We Use A Blood Test To Predict Catastrophic Racing Injuries In Horses?""

Awards

Presentation of the Gold Medal Horse Farm Award

Presentation of the Equine Science Center Spirit of the Horse Award

f facebook.com/RutgersEquineScienceCenter

instagram.com/rueguinescience

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/Evening2020**



A Post-Doc With A Purpose:

How Dr. Helio Manso Just Can't Get Enough Of The Rutgers Equine Science Center

rowing up Dr. Helio Manso had a slightly different career path before him than where he ended up. His father, a Veterinarian and Professor for Dairy Science, hoped that Dr. Manso would continue the family tradition and work with dairy cattle.

While this allowed Helio to work with animals, it wasn't until his father's friend asked him to visit that he found his real passion.

His father's friend owned an equine

clinic, and it was there that Dr. Manso had his first chance to work with horses. It was in that moment that he knew working with horses would be his new goal. Dr. Manso would go on to attend veterinarian school in 1983, and after graduating was approached by his college mentor to work at one of the largest show jumping horse farms in Brazil.

With over 900 horses and three arenas (2 covered and one outdoors), Coudelaria Souza Leão

was one of the top five locations in the world for show jumping horses.

Dr. Manso worked with visiting veterinarians showing them the setup and acted as the onsite veterinarian. The owner not only had a passion for horses, but for teaching, and invited people from around the world to come and work with his team.

Coudelaria Souza Leão was also a breeding facility where Dr. Manso was able to observe the cross breeding of Hanovarian, Westphalians, and Holsteiner horses to create a new type of horse, the SL breed.

It was thought that this horse would be better suited for jumping, and has since become popular throughout Europe and Brazil.

After his stint there, Dr. Manso was again approached by his mentor to come and work in

San Paulo. This time he would have an internship during 2 years at an equine hospital working with all kinds of breeds, doing all kinds of surgeries. Centro de Recuperação de Equinos JDO, the largest equine hospital in Brazil at the time, provide Dr. Manso with a plethora of experience as he conducted three to four surgeries a day.

"I spent two years there doing all my training in surgery, as a clinician, and then I went back to Recife and I decided to open a clinic," said Dr. Manso. "I opened a clinic and we bought an X Ray machine, an ultrasound, and my partner at that time she worked in the lab; she did ultrasound and I did X Ray and I started working in the local farms."

The clinic opened in the early 90s, but at some point Dr. Manso realized that in order to stay up



Dr. Manso (Left) in São Paulo, Brazil during his residence in Medicine and Equine Surgery at the Equine Recovery Center from 1988 to 1990.

to date, and provide better care for his clients, he would need to expand his education.

"I decided that I didn't know about nutrition. I need to learn a little bit more because in this will improve my business at the farms," Said Manso. "With horse farms the vets need to know little bit about nutrition."

So, Dr. Manso enrolled in 1996 in a master's program in animal production at Universidade Federal Rural de Pernambuco in Brazil. This would allow him to take courses that covered animal food and nutrition, but because they didn't have anything with a focus on horses at the university, his courses would use the pig as a model.

He excelled at his course work and was even able to balance running the clinic with his master program's expectations throughout his time at the university.

As luck would have it, right around the time that Dr. Manso was going to graduate, a position for Equine Science was opened after a current professor retired.

The university realizing the importance of keeping equine courses to improve their animal production courses decided to hire a new professor that would focus on the horse as an animal model.

So, with his experience of working on farms, working in a major equine clinic, running his own clinic with a partner, and now a master's degree in animal production, Dr. Manso decided to apply for the position.

The competition was fierce as 10 to 12 people from across Brazil all applied, but Dr. Manso was extended the position due to his experience, test scores, and knowledge.

While this was a huge step forward for him, unfortunately it would mean that he would have less time for other endeavors.

With the hard decision before him, Dr. Manso decided to sell his portion of the clinic so that he could dedicate his time to setting up a lab, teaching, and research.



Dr. Manso at Rutgers University during his Ph.D. program from 2001 to 2005. (Pictured left to right: Dr. Helio Manso, Cindy Betros, Jen McKeever, Dr. Kenneth McKeever, and Dr. Malcolm Watford).

The new position would also require him to attend educational meetings throughout the region, and neighboring countries. One such trip brought him to Argentina, where he met other equine scientists from throughout the region.

"One day they asked me to meet another colleague of theirs," Dr. Manso said. "We went to San Isidro Racetrack. San Isidro is green, it's amazing place to visit, and we went there at like 4:00 o'clock in the morning because that's when the vets are at the racetrack. So, we wake up early, have a coffee, and my friend and I waited for this colleague. After giving us a tour, he said for better farms, let's do exercise, it will be the future."

With this in mind Dr. Manso started to look into equine exercise, and exercise physiology. He wrote to Dr. Harold Hintz at Cornell, but was disappointed to find out that he had retired.

Dr. Hintz did offer to send along a letter to another equine specialist who he knew of, Dr. Sarah Ralston.

This started a correspondence between the two, and Dr. Manso would eventually come to Rutgers University for the first time in 1998 to meet with Dr. Ralston. He would even go with her to North Dakota to learn about the research that she was conducting.

Ultimately, he decided that becoming a graduate student at Rutgers to pursue his Ph.D. in Endocrinology and Animal Biosciences.

While he would have to wait until 2001 to attend due to his teaching commitments, he worked on preparing his materials. In 2000 he sent in his application, got his fellowship through Brazil, and moved to New Jersey.

His first year would include taking classes and working with Dr. Ralston and her five other graduate students. Mostly this work focused on nutrition in foals.

As his time at Rutgers continued, he was told by his home university that they wanted him to do more work with physiology. As luck would have it, Dr. Kenneth McKeever was a part of the equine science team at Rutgers and was able to provide some advice.

While they had spoken in passing, it was through a meeting that they had one day in the basement of Bartlett Hall (affectionately called "The Bunker") that would change his path yet again.

At the end of this conversation Dr. McKeever offered Dr. Manso a position in his lab working with foals and exercise. After speaking with his advisor, Dr. Ralston, he received approval to change advisors.

"We spent, around 2 years to do everything because we bought pregnant mares, had the babies, and kept both until the foals were weaned, and when they were weaned, we sold some mares and keep the foals until they turned one," said Dr. Manso. "Basically, I had three or four months before birth, and two or three months after the foals turned one, that we collected data."

His work focused on skeletal muscle metabolism in growing foals and the effect during that same time that occurred on the mares who gave birth.

Finishing his Ph.D. in 2005, he returned to Brazil. Once there, he built up his lab. This included new equipment, adding horses to the university herd, and the addition of his wife Dr. Helena Manso.

Every two years since 2005, Dr. Manso would come back to New Jersey. He would visit each time during the end of the fall semester, during Ag Field Day, and many times he would talk to Dr. McKeever. The topic would always be the same, how could Dr. Manso return to do a postdoc and to continue his work.

At some point the Brazilian government seeing the benefit of having their professors work on postdoctoral projects at other universities created a new program. Dr. Manso applied to the CAPES-PrInt-UFRPE program, and was granted acceptance.

"There were probably around ten professors," said Dr. Manso, "we have professors in Spain, we have professor in Italy, in Australia, in the stateswe have two in Indiana, and it's everywhere in





Lab Notes - Dr. Page

From The Lab:

Dr. Page's lab looks at using blood to find markers that can be used to predict catastrophic injuries in horses.

THE TOP 5 TAKE-A-WAYS



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Catastrophic racing and training injuries are a major concern for the Thoroughbred industry.

#2

Most catastrophic injuries have underlying damage prior to the acute injury. atastrophic injuries in Thoroughbred racehorses are a major concern for the racing industry and its fans. Previous research has shown that many catastrophic injuries occur in limbs with underlying and pre-existing damage, leading to the theory that these injuries occur when damage accumulation exceeds the healing capacity of the affected bones over time.

Since many of these injuries have underlying damage, it is likely that there are markers of this damage that can be detected prior to an injury. The identification of protein biomarkers for catastrophic injuries has been explored in previous research, albeit with limited success.

However, no one had examined messenger RNA as possible markers for underlying damage. Messenger RNA (mRNA) is a single-stranded RNA molecule that is generated from DNA through the process of transcription. This mRNA carries the genetic information specifying a particular amino acid sequence, which can then be used to create a protein through the process of translation.

While work looking at inflammation often involves measuring proteins, Drs. Allen Page and David Horohov from the University of Kentucky's Gluck Equine Research Center recently completed a study examining mRNA expression in injured and non-injured horses.

The overall objective of the study was to determine if horses that experienced a catastrophic injury during racing would show increased inflammatory mRNA expression at the time of their injury when compared to similar horses who were not injured.

Based on the findings from this study, it appears that there are several mRNA markers that can be used to identify horses at risk for catastrophic injuries, raising the possibility that there may be a costeffective and rapid way to decrease the rate of injuries in Thoroughbred racehorses.

This presents an **Messenger RNA Multiple mRNA** opportunity to (mRNA) analysis markers were detect circulating was recently used identified that to compare injured markers can be used to and non-injured identify horses indicative of at risk for the underlying racehorses. catastrophic damage. injury.



Dr. Helena Manso, in the Equine Exercise Physiology Laboratory, helped to process the fecal samples before they were sent out to the lab to be analyzed.

Spain." Dr. Manso wasn't the only one to travel to Rutgers under this program though, his wife also received the same fellowship for six months.

Her fellowship was housed under the Department of Nutritional Sciences with Dr. Malcolm Watford, and Dr. Manso's was in the Endocrinology and Animal Biosciences program, a part of the Department of Animal Sciences.

Dr. Manso's work would look at furosemide and the effect on microbiota in the gut.

Working in conjunction with Dr. Amy Biddle from the university of Delaware, and Dr. Allen

Page from the University of Kentucky to analyze the samples, Dr. Manso would collect blood and fecal samples of horses as they were given furosemide and then exercised. They would then analyze these samples to see changes in things like electrolytes and cytokines, as well as measure the changes that occur in the microbiota.

"I was reading and I found a paper from the 1970s from Cornell where they collected the liquid from feces and they showed the change in electrolytes in the feces, we kind of collected that Part 2," says Dr. Manso. "I think it will be fun see what's happened to the water in the feces and how it changes the electrolytes."

The other reason that Dr. Manso was so interested in the project was due to the fact that while Cornell worked on the study in 1970, even though the work is relatively simple not many research teams

were furthering the research into this type of experiment.

He also has hope for what this type of research can do to improve the well-being of horses. "I spent all my life trying to start something that I can apply, and maybe you can develop a new device," said Dr. Manso. "You could take the feces and squeeze and be able to say my horses has lost too much calcium, too much electrolytes." Such a device he believes would better improve things like training, recovery time, and general horse health.

As for the research into cytokines, Dr. Manso

was interested in how these types of measurements could be used to look at muscle inflammation.

Using a friend as an example he explained, "My good friend did some exercise last night and has pain everywhere. We could see inflammation right, but it's a good inflammation because she stressed the muscles and probably next three months five months if she keeps doing exercises, she will gain more muscles because this kind of stress keeps helping to develop the muscles."

While parts of his research are still being written for publication, some results have already been published. He looks forward to the papers that will come out over the next few months.

Dr. Manso returned to Brazil back in February and returned to his teaching and research duties at his university.

This summer he helped to run an equine conference with over 700 virtual attendees, and has

remained engaged with his colleagues at Rutgers, even inviting Equine Science Center Founding Director, Dr. Karyn Malinowski, to speak during the conference.

As for next steps, he is excited to see where his lab in Brazil will take him. "I still have some graduate students in Brazil, five graduate students, three Ph.D. and 2 masters students," said Dr. Manso. "One had a defense in February, and I keep trying to find money to keep my research going, and to improve the lab."

As Dr. Manso continues his work at his lab, he believes that due to the sheer cost of running the type of samples that are required to investigate the microbiome that this might not be feasible for his lab, but instead is interested in investigating how hormones might be able to be used to as markers for this type of work.



Dr. Manso pictured with his students at the Federal Rural University of Pernambuco.



Equine Ride-Along:

How One Undergrad Student Is Getting A Head Start On Her Future Career

A story by Francesca Buchalski he Rutgers Animal Science community has been working hard to overcome the gauntlet of challenges COVID-19 has thrown at us. From classes being moved to online learning, to practical courses being outright canceled, to externships being postponed indefinitely, handson opportunities suddenly seemed to vanish into thin air.

Like many of my fellow pre-veterinary students, I was concerned that my plans to gain essential hands-on veterinary experience would need to be put on hold until the uncertain, post-pandemic future.

But as the old cliché goes, every storm cloud has a silver lining, and opportunities often arise when we least expect it.

My silver lining came in the form of a phone call from Foundation Equine Wellness and Performance, asking if I could work as a veterinary assistant over the summer. After spending many summer and winter breaks shadowing with Foundation Equine and other veterinary practices, I finally had the opportunity to work as a fullyfledged veterinary assistant!

And I certainly hit the ground running! The first few appointments were a whirlwind of restraining horses, drawing up vaccines, jogging horses for lameness exams, and so much more.

The summer was full of routine procedures, from dental floats, to annual physical exams and health certificates for transporting horses, all of which I learned how to assist with.

Foundation Equine is a mobile veterinary practice, so the veterinarians examine and treat horses in the field rather than in a hospital setting.

Therefore, every piece of equipment—the x-ray machine, computerized lameness system, ultrasound, and shockwave machine, just to name a few—needs to be transported, set up, and packed away properly in the "vet mobiles" for each appointment.

Operating this equipment is typically a twoperson job, so I've gotten some hands-on equipment training that will certainly be useful in the future.



From New Brunswick down to Shamong, from Manasquan to just across the river in Bucks County, Foundation Equine provides outstanding veterinary care to horses throughout the state and into Pennsylvania. Based out of Bordentown, NJ, the practice consists of 4 veterinarians, 3 office personnel, 2 full-time veterinary assistants, and the part-time assistant shown above.

Not only have I learned about clinical veterinary medicine, I've also gotten a taste of the behind-thescenes work that allows a mobile vet practice to function efficiently.

It is truly a team effort among the veterinarians, office staff, and assistants that allows the business to run smoothly. Running and sending out lab work, making sure billing is done promptly and correctly, organizing and sending out radiographs, making sure all of the vet trucks are properly stocked...and the list goes on!

As someone with limited experience in business, learning these business skills has been a fantastic experience, and one that will serve me well both within and outside the field of veterinary medicine.

Foundation Equine is a four-veterinarian practice. In addition to general, preventative, and emergency medicine, each of the four veterinarians also has a unique expertise. This makes for a balanced, well-rounded practice, as well as a fantastic learning environment for an eager-tolearn pre-veterinary student. Dr. Keenan, who has an interest in reproductive medicine, mentored me in ultrasound interpretation, embryo flushing in pregnant mares, and even showed me how to identify a perfectly round embryo as it slowly rolled across the microscope field.

Dr. Makkreel, whose interests include lameness and performance medicine, showed me the ins and outs of lameness exams: how to observe moving horses, why certain, specific movements in different parts of the body correspond with specific types of lameness, and how turns, straight lines, flexions, and different surface textures are utilized together to obtain a comprehensive lameness picture.

With Dr. Lin, I learned about all things related to dentistry: how to safely restrain horses for tooth extractions, the pathophysiology of dental diseases, and how the landscape of the equine mouth changes with factors like age, breed, and repetitive behaviors like cribbing.

And with Dr. Bye, I received a crash course in the emerging field of equine chiropractic care how to identify misalignments and limitations in



A gastroscope (shown above) allows for visualization of the equine stomach and the identification of gastric ulcers. Normally, the picture from the camera is displayed on a computer screen, but in this particular case, the computer was substituted for an older model television due to technical difficulties.

range of motion, and how chiropractic adjustment in conjunction with muscle strengthening helps to keep both performance and non-performance horses moving correctly and comfortably.

Working with Foundation Equine has given me the chance to apply the knowledge and skills I'm learning in school to real veterinary scenarios. Almost everything I've learned in my animal science classes has come into play during different cases, and has given me a better understanding of diagnoses and treatment options.

Knowing what the reproductive tract of a horse looks like and understanding reproductive cycling allows me to follow along on ultrasound-guided pregnancy exams, and understand when would be the ideal time to breed a non-pregnant mare.

Knowledge of the equine digestive system is essential in understanding the prevalence of equine obesity, laminitis, and colic. A basic understanding of the underlying physiology of the horse from the microscopic level of hormones and ion concentrations up through the macroscopic level of glands and organs—allows me to understand why different treatments are (or aren't) effective.

And the reverse has been true too: my work in the veterinary field has given me a jump-start in understanding concepts like biosecurity, equine anatomy, and disease progression, which has been a huge asset for me in the classroom.

One of the things I enjoy most about working in a mobile equine clinic is that every single day is always a little different—and sometimes, very different!

My time with Foundation Equine has shown me just how important it is to be able to think outside of the box in veterinary medicine, and to be able to come up with creative solutions when unexpected problems arise.

One "outside-the-box" appointment in particular stands out to me. Dr. Bye, vet assistant Caitlin, and I were called out to perform a gastroscopy to check a horse for gastric ulcers. During the procedure, a gastroscope—a long, flexible tube with a camera on the end—is inserted into the horse's stomach, and ulcers can be identified on a connected computer screen. At this appointment however, we had an equipment malfunction, and there was no visual on the computer screen.

After troubleshooting for a while, we finally arrived at a rather unique solution: connect the gastroscope to an older-model television with a video jack.

The horse's owner happened to have a television that fit the bill, and after connecting some wires and changing the channel input, low-and-behold, we had visual, and Dr. Bye was able to make a successful diagnosis on a 1990s television!

I've learned how essential skills like creativity and resourcefulness are when outside-the-box cases like this one inevitably arise.

"After 36 years in practice in Central Jersey I still love what I do. You would think after all these years that the daily routine would be rote, but it is neither routine nor rote," says Dr. Keenan. "I pretty much learn something new every day, and that learning process is anything but rote: there are subtle differences, and often not so subtle differences between similar cases that keep us, as

veterinarians, on our toes. Having young Veterinarians, and students hoping to be Veterinarians, involved in the practice is one of the things I enjoy the most about practice. They all have something to offer and, in many cases, provide new ways of looking at things, diagnosing and treating cases."

I've also seen how a network of different mobile practices, equine hospitals, farriers, breeders, horse owners, and trainers communicate ideas, ask and answer questions, offer and accept advice, and rely upon and support each other to keep horses across the region healthy and performing at their best.

I've seen veterinarians collaborate with farriers in order to perform x-ray guided horseshoeing for complex hoof cases, such as laminitis, hoof injuries, and congenital deformities; I've seen trainers working with veterinarians to implement the most effective re-conditioning programs for horses recovering from an injury.

Different equine professionals working together and bringing different skills to the table keeps our equine landscape strong and healthy.

This is the part of the veterinary profession that I am most excited about—participating in this network of equine professionals as a team player. I've seen just how many different "hats" veterinarians wear beyond the obvious one of "doctor": business person, educator, problem solver, information source, mentor, and mentee are all "hats" within a veterinarian's repertoire.

As someone with a passion for learning, teaching, problem solving, science, and animals, I have never been more certain that veterinary medicine is the career path for me—and the knowledge and skills I've gained from my time at Foundation Equine will propel me forward into veterinary school and beyond.



During her work with Dr. Lin, Francesca learned about the different type of dental procedures that typically occur with horses. Above are some examples of problematic teeth. From left to right: a fairly normal equine incisor, an incisor with a fractured root, and diseased incisors with sections of breakdown and resorption.



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