

HIGHLIGHTING RESEARCH
AND OUTREACH EFFORTS AT
THE UNIVERSITY OF KENTUCKY

NOVEMBER/DECEMBER 2021
ISSUE #0020

EQUINE SCIENCE REVIEW

CA.UKY.EDU/EQUINE
[@UKAGEQUINE](https://www.facebook.com/UKAGEQUINE) ON FACEBOOK/TWITTER

**PROTECT YOUR OLDER HORSE THIS
WINTER WITH THESE TIPS, 3**
Preparing horses for the cold is
important, especially as they age.

**UK'S HONORS FOUR RETIRING TITANS OF
EQUINE RESEARCH AND SERVICE, 7**
Four esteemed faculty members
will soon hang up their lab coats.

**WARMER WEATHER MAY IMPACT EARLY
FOALING MARE PASTURES, 13**
Carefully consider how recent
weather might affect tall fescue.

**DEMAND FOR WILD HORSES AND BURROS
STUDIED, 14**
Number of wild horses, burros con-
tinues to exceed BLM levels.



College of Agriculture,
Food and Environment

WRITER, EDITOR AND LAYOUT

Holly Wiemers, MA, APR communications and managing director; UK Ag Equine Programs | holly.wiemers@uky.edu

EDITORIAL ADVISORY BOARD

Emma Adam, DVM, PhD, DACVIM, DACVS, assistant professor, research and industry liaison, Gluck Center

Craig Carter, DVM, PhD, Dipl. ACVPM, director, UK Veterinary Diagnostic Laboratory

Richard Coffey, PhD, chair, Animal and Food Sciences

Bob Coleman, PhD, PAS, Dip. ACAN, associate professor and equine extension specialist, Animal and Food Sciences

David Horohov, PhD, chair, Veterinary Science, director; Gluck Center, Jes E. and Clementine M. Schlaikjer Endowed Chair, Gluck Center

Dan Howe, PhD, acting chair, Veterinary Science, acting director, Gluck Center

Laurie Lawrence, PhD, professor, Animal and Food Sciences

Krista Lea, MS, coordinator, UK Horse Pasture Evaluation Program, Plant and Soil Sciences

James N. MacLeod, VMD, PhD, director, UK Ag Equine Programs and John S. and Elizabeth A. Knight chair, Gluck Center

Martin Nielsen, DVM, PhD, Dipl. ACVM, Schlaikjer professor of Equine Infectious Disease, associate professor, Gluck Center

Mick Peterson, PhD, professor, Biosystems and Agricultural Engineering

Laura Skillman, director, Agricultural Communications Services

Ray Smith, PhD, extension professor, Plant and Soil Sciences

Jill Stowe, PhD, associate professor, Agricultural Economics

DESIGN

Jordan Smith, marketing manager, UK College of Agriculture, Food and Environment

Equine Science Review is a monthly College of Agriculture, Food and Environment newsletter that highlights important equine work happening at the University of Kentucky.



Photo courtesy Dr. Jimmy Henning.

PROTECT YOUR OLDER HORSE THIS WINTER WITH THESE TIPS

Winter is upon us, or on the horizon. For the owners of horses 15 and up, this means bracing for some of the challenges which may hinder older equines. Preparing horses for the cold is important, especially as they progress in age.

“We must take into account several important considerations for preparing and maintaining older horses throughout the cold season,” said Amanda Adams, PhD, associate professor and MARS Equestrian Fellow in the Department of Veterinary Science, who maintains a herd of senior horses as part of her program at the Gluck Equine Research Center.

“SOME OF THE MOST IMPORTANT POINTS TO CONSIDER INCLUDE BODY CONDITION AND NUTRITION, DENTAL CARE, PARASITE CONTROL, VACCINATION STATUS, EXERCISE AND HEALTH MONITORING.”

Beginning with body condition and nutrition, first assess a horse’s body condition score. While a little extra poundage won’t hurt going into winter, too much could bring problems.

“Is your horse too thin or too fat? Maybe it’s just fine as is,” Adams said. “This is a call you have to make before winter sets in and then feed appropriately. If you don’t feel comfortable making this call yourself, involve your veterinarian or a nutritionist.”

Adams said that horses at a body condition score of 5 or greater will have some extra fat stores that can provide insulation during the winter months; however, if the horse is overweight, insulin dysregulation could become a problem.

She recommends owners of senior horses to determine the horse’s metabolic status. Is the horse insulin dysregulated or



PHOTO COURTESY UK COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT.

affected by Pituitary Pars Intermedia Dysfunction? This information will also help guide in how you feed and manage the horse throughout the winter. If the horse is on the thinner side with body condition less than 5 going into winter, increase the calorie intake slowly to improve his BCS. This can be done by providing additional forage, concentrates, especially those designed for senior horses or by adding sources of oil or fat supplements. Also consider pecking order and make sure your senior horse is not at the bottom of order, as this can make a difference in body condition. Access to shelter and blanketing can also help in maintaining condition, as less calories are being used to maintain body temperature.

During cold months, it’s important to provide a salt/mineral lick and make sure that they are always available and accessible. Likewise, make sure water sources aren’t frozen over and have good footing around them. Sufficient water intake in the winter for senior horses is important to help prevent impaction colic.

An older horse’s teeth need to be examined at least twice a

year, one of which should take place prior to cold weather setting in. This will help them chew and consume hay adequately, allowing proper utilization of energy sources needed to stay warm in the winter.

“Dental care is important especially if you notice your older horses starting to drop grain, quid or lose weight,” Adams said. “Proper dental care also helps prevent things such as choking and colic. Hoof care is important as well since bad feet can lead to large bills if not properly taken care of. When considering hoof care, you should probably think about pulling or changing their shoes to prevent slipping on ice. Adding borium or snow pads to protect their sole might also be a consideration. Most importantly, keep an eye on your horses’ feet daily and remove ice accumulation as needed.”

Parasite control is critical, as older adults are likely to harbor more parasites. An example is a study by Adam’s team from UK that found older horses demonstrate statistically higher fecal egg counts compared to middle-aged adults. If given anthelmintic treatments, however, FECs declined significantly. It might be beneficial

to deworm your horse after the first frost, up to three times a year taking into consideration FECs. Higher parasite load could also be contributing to poor body condition in the senior horse.

Make sure to maintain a regular vaccination program. Adams' group has shown that senior horses have reduced immune responses to vaccination and are at risk for increased susceptibility to respiratory illness, in particular equine influenza. Horses with Pituitary pars intermedia dysfunction, also known as Cushing's disease, are likely to have even further reduced immune response to vaccinations and increased susceptibility to infections.

"If you have a higher risk senior, think about having your vet administer a booster for risk-based vaccines," Adams said. "These include EIV, equine herpesvirus-1 and potentially West Nile virus, every six months, particularly if your horses are showing or co-mingling with other showing

horses during the winter months."

Like humans, if older horses don't get their share of exercise, then the less spritely they will become. During the winter months it is important to prepare your horse for exercise with ample warm-up and cool-down periods. After finishing, cool your horse out completely. Remember, use common sense when judging riding conditions, as older horses do not adjust well to stressful conditions.

Finally, monitor senior horses closely for health conditions which you might not have previously considered. These include respiratory illnesses, skin conditions, signs of colic and arthritis. As horses progress in years, a phenomenon called Inflamm-aging happens.

"Inflamm-aging is a low-grade, chronic inflammation," Adams said. "Inflamm-aging, like in humans, could be contributing to age-related conditions such as arthritis, however we have yet to understand the full picture in the

senior horse. We have recently shown that season impacts the levels of inflammation and that levels are quite high during winter. Work with your veterinarian to determine if your older horse could benefit from anti-inflammatory therapies to help with arthritis discomfort. In the meantime, we are working on understanding if there are any effective, natural anti-inflammatories that would help the older horse." As horses age, we want to make sure that they are taken care of to keep them living a longer and healthier life. That protection starts by keeping them safe this winter. For more information on senior horse care and preparing your horse for winter, contact Adams at amanda.adams@uky.edu.

| *Jordan Strickler is an agriculture communications specialist within UK's College of Agriculture, Food and Environment.*

WINTER CAN MEAN POOR FOOTING FOR HORSES

Winter is here, which means it's time to talk muddy fields.

Those familiar with horses know that cold seasons can make your farm quite muddy. Mud is not ideal ground for a variety of reasons. First off, it can create erosion of topsoil and the loss of organic matter, while increasing soil compaction. Second it can cause weight loss as horses who traverse through mud expend more energy. They also can suffer because mud on the animals' coats makes it more difficult for them to regulate their body temperature. This increases the amount of energy they need to generate heat for warmth in the winter. Mud can also up the risk of slipping and falling. And

don't forget lost shoes, the bane of most horse owners.

"In winter you get the same amount of rain as you would in the summer, however, you don't have the temperatures to evaporate it," said Stephen Higgins, PhD, director of environmental compliance for the University of Kentucky College of Agriculture, Food and Environment's Agricultural Experiment Station. "When you mix water, soil and foot traffic, you get a lot of mud."

Fortunately, there is a solution: heavy-use traffic pads.

"Traffic pads are a great solution," Higgins said. "You have many material choices for heavy-use pads. Some of these include concrete, plastic traffic grid and



PHOTO COURTESY DR. JIMMY HENNING.

geotextile fabric and rock. However, for horses, I would not recommend concrete as they need softer surfaces. The material you use varies depending on many factors, including material availability, installation costs and the size of your operation.”

Pad thickness depends on the type of livestock you have, stocking density and whether the area also gets a lot of equipment traffic. Higgins says with equine traffic, an eight-inch-thick layer of dense grade aggregate placed on a six-to-eight-ounce non-woven geotextile fabric would be the best course of action.

Geotextile fabrics are generally used in road construction projects for subgrade stabilization. The geotextile, which is used to separate the soil from the rock layers, is a key component for effective long-term performance of the traffic pad. If the geotextile is not used, the rock material will sink into the ground over time and mud will seep up through the voids. This would negate all of the

work (and money) which had been dedicated toward creating safe footing for horses in the first place. The purpose of geotextile fabric is to separate the rock from the soil, provide reinforcement, and friction, while providing drainage for the rock matrix.

Ideally pads would be located on a summit and not a sloping area. If it must be constructed in a hilly location, the area should be leveled to allow runoff to move across as sheet flow to reduce channeling and erosion of the rock pad.

However, like everything else, COVID-19 has thrown an unforeseen wrench in the works.

“Some things aren’t as cost effective anymore,” Higgins said. “The price of plastic resins has gone up 30% in the past year. So now we’ve had to look at other ideas. Some are a little inventive, such as cinder blocks.”

Higgins said that one idea is to set the blocks on the ground on filter fabric and then backfill it with rock. In addition to providing

infiltration, cinder blocks absorb moisture from the environment. The blocks end up acting like sponge in that they wick moisture. This type of footing surface is an idea for indoor areas. A bench top lab study suggested that each block could actually store an entire gallon of liquid. It’s not without its drawbacks, however. This type of flooring might also draw moisture to the surface near an animal and bedding.

“We all want to take care of our horses,” Higgins said. “One of the best ways to do that in the winter is to take care of their footing. Pads can really save owners plenty of headaches down the road.” More information for installing pads for horses can be found online [here](#).

| *Jordan Strickler is an agriculture communications specialist within UK’s College of Agriculture, Food and Environment.*

EQUINE INNOVATORS PODCAST: ROTAVIRUS ON THE MOVE IN FOALS

In this episode Emma Adam, DVM, PhD, DACVIM, DACVS, assistant professor, research and industry liaison at the Gluck Equine Research Center, describes the research that identified a novel strain of rotavirus in foal diarrhea cases this year.

This podcast is the 12th episode in our “Equine Innovators” podcast series, brought to you by Zoetis. You can find “Equine Innovators” on TheHorse.com, Apple Podcasts, Spotify, Stitcher, and Google Podcast.



About the researcher: Adam is an assistant professor at the Gluck Center and the equine outreach veterinarian for UK’s Department of Veterinary Science. Her career focuses on the health and well-being of the equine athlete, and she has worked in four countries on three continents.



PHOTO COURTESY UK COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT.

UNIVERSITY OF KENTUCKY RISES ABOVE TORNADO AFTERMATH

In the midst of utter destruction caused by the Dec. 11 tornado outbreak, University of Kentucky employees continue to press on, offering help where and when their fellow Kentuckians need it the most.

The UK Research and Education Center in Princeton took a direct hit from the powerful tornado that began in northwestern Arkansas and carved a path of destruction across the western half of Kentucky. UKREC employees, led by director Carrie Knott, worked through the weekend, securing and caring for animals, assessing damage and offering support.

“Our hometown heroes of hope—our faculty, staff and Extension agents in our Western Kentucky communities have rallied to assist others even as we were dealing with damages to critical UK facilities in Western Kentucky,” said UK President Eli Capilouto, PhD. “As the University for Kentucky, we understand how important faculty and staff at the UK Research and Education Center and Cooperative Extension Service are to relaying educational information to their communities. We are committed to rebuilding, helping the area recover and emerging stronger than before.”

“The center is the home to a group of very dedicated UK employees, and I commend Dr. Knott and her staff for their heroic weekend recovery efforts,” said Nancy Cox, PhD, dean of the UK College of Agriculture, Food and Environment and UK vice president for land-grant engagement. “While the center won’t be the same for some time, the college is committed to helping our employees and communities recover from these



AERIAL VIEW OF THE UK RESEARCH AND EDUCATION CENTER AFTER IT TOOK A DIRECT HIT FROM A WEEKEND TORNADO. PHOTO BY MATT BARTON, UK AGRICULTURAL COMMUNICATIONS.

[VIDEO OF DECEMBER 11 TORNADO AFTERMATH HERE.](#)

[PHOTO GALLERY OF DECEMBER 11 TORNADO AFTERMATH HERE.](#)

devastating events and serving the Western Kentucky agricultural community.”

While the physical structure that housed the UKREC is gone, the center has been, and always will be, vital to Kentucky agriculture. As a testament to the importance of the center to the state’s agriculture industry, two temporary office buildings and two temporary storage buildings will be placed on-site Dec. 14 for UKREC personnel.

“The outpouring of community support has been very humbling to us,” Knott said. “We are not closing our doors, but we will look a little different and be a little more fragmented at least for the near future.”

Due to the number of debris, officials ask that the public stay away from the center as the area is unsafe and structurally unsound.

The center was established

in 1925 on nearly 1,300 acres about one mile from downtown Princeton. In 1980, the Rottgering-Kuegel Agricultural and Extension Building was added and housed the center’s nearly 50 staff and hosted countless extension and area meetings. That facility underwent a major renovation and addition to house the UK Grain and Forage Center of Excellence, which opened in 2019. Since its inception, numerous stakeholders have provided strong support to the center and critical funding for many of its improvements.

“The Kentucky agricultural community is a strong community. It is a kind community, and it is a generous community,” said Chad Lee, director of the Grain and Forage Center of Excellence. “We are going to rely heavily on them to help us get through this as we work to build anew. Our hearts are broken but not our spirits.”

Over the years, scientists at the center have spearheaded many important research endeavors including numerous no-till research projects, precision agriculture application studies and a soil fragipan research breakthrough. Center specialists have been the area farmers' go-to resource for research-based information in agronomics, forages, beef management, disease control, pest control, precision agriculture, grain storage systems, soil fertility and grain marketing.

Numerous counties are dealing with the aftermath of the destructive tornadoes. The UK Cooperative Extension Service is diligently working with area organizations to meet the needs of tornado victims. Extension has partnered with the Kentucky Department of Agriculture to offer support for affected farmers.

HOW TO HELP:

Those who wish to donate farm supplies should contact their local extension office. Extension agents will deliver products to the KDA for distribution to farm organizations working to meet the needs of impacted farmers.

Kentucky 4-H has a [4-H'ers Helping 4-H'ers Relief Fund](#) that is collecting donations to help affected 4-H members, families and staff.

The Kentucky Division of Emergency Management is also accepting donations and relief effort volunteer applications. Individuals can offer to donate supplies or apply to volunteer [here](#).

The Kentucky Department of Agriculture has partnered with the Kentucky Farm Bureau to develop a [GoFundMe account](#) to provide monetary support for affected farmers. Donations are tax deductible.

Individuals, who wish to make monetary donations to the tornado victims, may do so by donating through [UK's Office of Philanthropy](#).

Individuals may donate to help affected UK students [here](#).

UK also offers the C.R.I.S.I.S. (Crisis Relief in Situations Involving Staff and Faculty) Program to help UK employees experiencing personal hardship. UK faculty and staff may request assistance [here](#).

Individuals may also mail checks with a comment to support UK CAFE Tornado Relief to UK Philanthropy, P.O. Box 23552, Lexington, KY 40523.

| *Source: Dec. 13 UK College of Agriculture, Food and Environment news release. Katie Pratt is an agriculture communications specialist.*

UK'S DEPARTMENT OF VETERINARY SCIENCE HONORS FOUR RETIRING TITANS OF EQUINE RESEARCH AND SERVICE

Four esteemed faculty members within the University of Kentucky's Department of Veterinary Science will soon hang up their lab coats in retirement over the next few months, closing chapters in each of their professional lives that have been marked by indelible research and service impacts to the equine industry.

At UK's Spindletop Hall in Lexington, Kentucky, Nov. 2, an audience of veterinarians, equine health professionals, fellow academicians and friends gathered to honor Barry Ball, DVM, PhD, Dipl. ACT, Albert G Clay Endowed Chair in Equine Reproduc-



LEFT TO RIGHT, DRs. PETER TIMONEY, CRAIG CARTER, DAVID HOROHOV AND BARRY BALL. PHOTO COURTESY UK COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT.



PHOTO COURTESY UK COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT.

tion at the Gluck Equine Research Center; Craig Carter, DVM, PhD, Dipl. ACVPM, director of the UK Veterinary Diagnostic Laboratory; David Horohov, PhD, chair of the Department of Veterinary Science at UK, director of the Gluck Center and Jes E. and Clementine M. Schlaikjer Endowed Chair; and Peter Timoney, MVB, PhD, FRCVS, Frederick Van Lennep Chair in Equine Veterinary Science at the Gluck Center.

They have served UK and the international equine industry for a collective 84 years, time marked by vast scientific advancement on some of the most pressing issues facing the industry.

“Equine is a special part of UK. The university has been conducting research to protect the health and well-being of the horse since the early 1900s when the Department of Veterinary Science was established. In 1985, a significant investment was made to further equine research by establishing the Gluck Equine Research Center. The Gluck Center is one of three facilities in the world exclusively dedicated to equine research. Located in the Horse Capital of the World, and arguably the horse health capital of the world, the research capabilities at the Gluck Center are unparalleled,” said Vice President for Land-Grant Engagement and Dean of the College of Agriculture, Food and Environ-

ment during the ceremony. “While the facilities have continued to grow, it is our people that truly make this place a world-renowned epicenter for equine health and research. Our heartfelt appreciation and best wishes go to each of our retirees who have contributed so much to the equine and veterinary science community.”

“Drs. Ball, Carter, Horohov and Timoney have given tremendously to the department and to the equine and livestock industries that we serve. Without question, replacing the expertise of these four eminent faculty members will be a major challenge for the Department of Veterinary Science over the next several years,” said Daniel Howe, PhD, incoming interim chair of the Department of Veterinary Science and interim director of the Gluck Center. “It has been a privilege to work with and learn from each of them, and I wish them the best in their well-deserved retirement.”

“A true testament to the iconic footprint of the Gluck Equine Research Center as an international resource into our insight and understanding of the health of the horse rests with the quality of its esteemed faculty. This group of retirees leaves an indelible mark on the landscape of equine research, and we thank them for all they have done on behalf of the horse,” said Stuart Brown, DVM, Keeneland’s vice president of

equine safety and current chair of the Gluck Equine Research Foundation Board.

“We were fortunate to get to celebrate the careers and achievements of four of these individuals who have dedicated themselves to furthering our mission at the Gluck Center through their scientific discoveries that have resulted in the improvement of equine health. These accomplishments were made possible through the visionary leadership of those who have helped to lead this great institution in the past, such as Dr. Peter Timoney, and we have been fortunate over the past six years benefiting from the sage leadership of Dr. David Horohov, who retires as the Chairman of Veterinary Science and Director of the Gluck Center at the end of this year. His guidance of the program, especially in light of challenges experienced in the past two years of the pandemic, have been truly remarkable in sustaining this mission and preparing the Gluck Center to prosper in the years to follow in sustaining the reputation of this vital resource for the equine industry,” Brown said. During the retirement ceremony, prominent members of the equine health community talked about the impact of each of the retiring faculty members and led a toast in their honor.

Tom Riddle, DVM, of Rood & Riddle Equine Hospital spoke about Ball’s impact on equine reproduction research, citing his work on nocardioform placentitis as a recent example of the impact he has had on the industry.

Bob Stout, DVM, retired Kentucky State Veterinarian, toasted Carter and shared the important work in disease surveillance that the UK VDL provides to the Commonwealth of Kentucky and its livestock industries.

Brown thanked Horohov for his service to Kentucky’s equine industry, his leadership of the Gluck Center over the past seven years

and highlighted the Gluck Center's recent work with a novel Rotavirus B strain discovered in Central Kentucky during the spring of 2021.

Finally, Chauncey Morris, executive director of the Kentucky Thoroughbred Association and Kentucky Thoroughbred Owners and Breeders', shared remembrances of his time traveling with Timoney, who he called a rock star in other countries, known as THE guy who was the equine infectious disease expert. He also drew laughter from the audience by ribbing the Irish-born Timoney for eschewing casual or even business casual attire in favor for his daily suit and tie. Below is more about each of the retirees, including some of their thoughts as they transition into this next chapter of their lives.

BARRY BALL, DVM, PHD, DIPL. ACT, ALBERT G CLAY ENDOWED CHAIR IN EQUINE REPRODUCTION AT THE GLUCK EQUINE RESEARCH CENTER

"It has been a tremendous opportunity to be a faculty member at the Gluck Equine Research Center. I have particularly enjoyed the chance to work with veterinarians, farm managers, owners and farm personnel to address some of the problems related to equine reproduction in Central Kentucky," Ball said. "The support of this community for research directed toward the welfare and good of the horse is, in my experience, unparalleled. "It has also been a great opportunity to work with the numerous graduate students, post-doctoral scholars and visiting scientists who have been in the lab. A number of these have gone on to faculty positions in veterinary medicine, which is important to ensure future research expertise related to the horse," he said.

Ball's official retirement will be in February 2022.

"Post-retirement, my wife, Heidi, and I will continue to work with horses on our Woodford County farm. I plan to continue a long-time



DR. BARRY BALL. PHOTO COURTESY UK COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT.

passion for woodworking and furniture building, and we look forward to continued involvement with the equine community in Central Kentucky," he said.

Ball is a Diplomate of the American College of Theriogenologists. He has received numerous awards, including the Smith-Kline-Beecham Award for Research Excellence, the Excellence in Equine Research Award from the American Veterinary Medical Association, the Schering-Plough Award for Outstanding Research from the World Equine Veterinary Association, the Norden-Pfizer Distinguished Teacher award from UC-Davis and the Theriogenologist of the Year award. Ball was a Fulbright Distinguished Scholar at the University of Cambridge during 2004-05. He is a past chair of the International Equine Reproduction Symposium Committee, and he is a past president of the American College of Theriogenologists.

In 2010, Ball was appointed as the first Clay Endowed Chair in Equine Reproduction at the Gluck Center. His current research emphasis has been directed toward reproductive endocrinology and

pregnancy loss in mares.

Prior to coming to UK, Ball served as the Hughes Endowed Chair in Equine Reproduction at the University of California, Davis, a position he had held since 1996. Before that, he was on the faculty at Cornell University from 1987-1996.

Ball earned his DVM from the University of Georgia in 1981 and completed a theriogenology residency at the University of Florida and his graduate training at Cornell University.

His research is documented in more than 200 refereed research publications. He has served as primary mentor for 10 PhD students, six MS candidates and 17 post-doctoral or visiting scholars. He also mentored 16 clinical residents who are board-certified by the American College of Theriogenologists. Of his trainees, 10 serve as current or past faculty members in veterinary medicine in the U.S., Canada, Europe and South America.

CRAIG CARTER, DVM, PHD, DIPL. ACVPM, DIRECTOR OF THE UNIVERSITY OF KENTUCKY VETERINARY DIAGNOSTIC LABORATORY

"It has been the greatest honor and privilege to have spent 17 blessed years here at the University of Kentucky. There have been so many exciting challenges, projects, success stories, incredible students and wonderful people to work with all over the UK campus and around the Commonwealth," Carter said. "I am so grateful for the amazing support by Dean Nancy Cox and her team to help grow our laboratory's client base, better serve our animal agricultural stakeholders and for making the funds available to double the size and quality of our facilities.

"I am eternally indebted to Dr. Robert Stout, Kentucky State Veterinarian recently retired, for his excellent leadership and for his faithful support and sage guidance



DR. CRAIG CARTER. PHOTO COURTESY UK COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT.

for our laboratory,” he said

“A million thanks go out to our veterinary, farm and companion animal clients who confide in the quality of our diagnostic services, in a quest to preserve the health and welfare of animals, large and small. I am so proud to have been surrounded by such a brilliant, conscientious and devoted faculty and staff that work so hard every day to sustain animal health and human health, in the spirit of One Health. My beloved wife Ronda and I are looking forward to spending the rest of our years on Freedom Farm in Spears, Kentucky,” he said.

Carter had originally planned to step down at the beginning of 2021, but the arrival of COVID-19 changed those plans.

“I just couldn’t abandon my troops in the middle of a war,” he said.

Carter now plans to phase out his retirement to a 50% involvement to help transition the leadership role to a new director and help launch a new metagenomics laboratory.

Carter earned his DVM in 1981 from Texas A & M University. After completing his degree, he opened a solo large animal ambulatory medicine and surgery practice in Texas for five years.

He joined the Texas Veterinary Medical Diagnostic Laboratory (TVMDL) as a clinical associate, completing his Master’s in Epidemiology, a PhD in Veterinary Public Health and passed his board certification in Veterinary Preventive Medicine.

In 1985, Carter established the Department of Epidemiology and Informatics at the Texas VDL and served as department head. In that role, he oversaw the design, development, and implementation of two custom enterprise-wide laboratory information management systems (LIMS) which included electronic clinical reporting, near real-time disease monitoring and mapping for the laboratory and its clients. He conducted infectious disease epidemiological investigations and provided monitoring for confirmed livestock, companion animal and zoonotic diseases occurrences across the state. Carter established the first-ever formal relationship with the Texas Department of Health to provide awareness of zoonotic animal diseases posing a threat to human populations. For 25 years, he participated in the TVMDL necropsy service rotations.

In 2005, he was recruited to UK’s Department of Veterinary Science as a professor, establishing a diagnostic epidemiology unit at the UK VDL in the wake of Mare Reproductive Loss Syndrome. In 2007, he was appointed director. In that role, he oversees lab operations, major construction projects, infectious disease research (\$6 million in funded projects), manages and teaches in a cooperative teaching program with Lincoln Memorial University CVM, and chairs/serves on graduate student committees (20 since 1988). Carter served as president of the American Association of Veterinary Laboratory Diagnosticians in 2011. He also held the position as executive director for the World Association of Veterinary Labora-

tory Diagnosticians from 2000-2017, overseeing the planning for eight international meetings. He served as the executive director for 10 years and is the immediate past president of the American Veterinary Epidemiology Society (AVES). His research interests include infectious disease epidemiology, anti-microbial resistance, food security, electronic animal health monitoring, computer-based clinical decision support and laboratory information systems. He is active internationally, has worked closely with several OIE Committees, aiding in laboratory capacity building and other assignments in more than 40 countries in civilian and military capacities.

Carter served on active and reserve duty in the U.S. Air Force and U.S. Army from 1967-2009, including three combat deployments, retiring as a full Colonel (awarded the Legion of Merit).

DAVID HOROHOV, PHD, CHAIR OF THE DEPARTMENT OF VETERINARY SCIENCE AT UK, DIRECTOR OF THE GLUCK EQUINE RESEARCH CENTER, AND JES E. AND CLEMENTINE M. SCHLAJKER ENDOWED CHAIR AT THE GLUCK EQUINE RESEARCH CENTER

“Now that I am preparing to retire, I look back to my first visit to the Gluck Center in the early 1990s. I regularly read the papers produced by the Gluck faculty and was excited about the opportunity to meet them. Happily, I was able to return multiple times in the subsequent years having established several collaborations with the faculty. Needless to say, I was very pleased to join the department in 2003 as the William Robert Mills Chair in Equine Infectious Disease,” Horohov said.

“Being here has not only allowed me to continue and expand my collaborations with the Gluck faculty, but also provided the opportunity to work with local equine veterinarians, farm managers and horse owners. These opportunities,



DR. DAVID HOROHOV. PHOTO COURTESY UK COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT.

combined with the resources provided by the department, allowed my research program to greatly expand,” he said. “Though quite content with being a researcher, I accepted the opportunity to serve as the chair of the Department of Veterinary Science and director of the Gluck Center in 2014.

“My goal during my tenure as chair and director has been to continue the overall mission of the Gluck Center and to build upon its legacy as the leading institution for equine research. We have done that through the recruitment of exceptional faculty and students to our program and by modernizing and updating some of our facilities,” he said. “While this will be an ongoing effort, I believe we have made significant progress towards this goal and the future remains bright. Now I will be pursuing other goals during my retirement, but I will always reflect back on all that the Gluck Center and its faculty provided me during my time there.” Horohov earned his BS from Penn State, his MS from Purdue University and a PhD from the University of Tennessee working on the regulation of the immune response to herpes simplex virus.

He was a staff fellow at the Food and Drug Administration in Bethesda, Maryland, before accept-

ing a faculty position at the School of Veterinary Medicine at Louisiana State University. In 2003, he moved to UK to become the W.R. Mills Endowed Chair in Equine Infectious Disease and in 2013, he accepted the position of Schlajjker Chair in Equine Immunology. Horohov now serves as the chair of the Department of Veterinary Science and the director of the Gluck Center, where he oversees the activities of 24 faculty. His research program focuses on the immune response of horses to various infectious and non-infectious diseases. His laboratory was responsible for the cloning and sequencing of a number of equine cytokines and the development of RT-PCR assays for their detection. One particular focus of his equine career has been around *Rhodococcus equi*, and the research breakthroughs in his laboratory have been instrumental in furthering our understanding of why certain horses are impacted by the disease. Some of his ongoing work has been focused on equine safety, specifically exercise induced inflammation and its contribution to equine injury. This work is just one example of how his research has evolved when needed to serve the equine industry.

Horohov has authored or co-authored more than 160 scientific articles. He has made numerous research presentations at national and international meetings and is recognized for his expertise in equine infectious diseases and immunology. He has been the principal investigator on more than 50 externally funded research grants and contracts and the mentor of 15 graduate students and six post-doc students. He has received awards and recognition for both his research and teaching activities.

PETER TIMONEY, MVB (HONS), MS, PHD, FRCVS, PROFESSOR, FREDERICK VAN LENNEP CHAIR IN EQUINE VETERINARY SCIENCE AT THE GLUCK EQUINE RESEARCH CENTER



DR. PETER TIMONEY. PHOTO COURTESY UK COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT.

Timoney, who has been in phased retirement for the past two years, reflected on a lifetime of serving the equine industry, the people he has met and the changes of the equine industry over time.

“I feel so fortunate in life that I chose a profession that kept me challenged and rewarded, especially with people I’ve met and developed friendships and relationships with. That has been the real pleasure of it,” he said. “I feel the same sense of anticipation and fulfillment every day I walk into the Gluck Center, whether it’s a Monday morning or a Friday afternoon.

“I have benefitted more than I think I have provided others,” he said.

Timoney said he plans to travel some, and that he has an interest in his chosen field that will never leave him. In many ways his retirement will look a lot like the years he spent actively working. He plans to always be reading and learning and thinking about the challenges in his field.

“For me it has always been

about serving the industry and about the health and well-being of the horse,” he said.

A native of Dublin, Ireland, Timoney earned his MVB (Hons) from the National University of Ireland (U.C.D.) in 1964. Shortly after graduating, he moved to the U.S. to pursue graduate studies at the University of Illinois’ Center for Zoonosis Research, obtaining his MS degree in virology in 1966. Returning to Ireland, he accepted appointment at the Irish Department of Agriculture’s Veterinary Research Laboratory, specializing in large animal virology. In 1972, he was tasked with the responsibility of establishing and directing an equine diseases section at the laboratory. He spent 1973 visiting various institutions in the USA and Canada learning all he could about equine infectious diseases before returning to Ireland to fulfill the responsibility he had been assigned.

Timoney earned his PhD from the University of Dublin in 1974 and F.R.C.V.S. from the Royal College of Surgeons, London, in 1978, both in virology. In 1979, he accepted appointment as associate

professor in virology at Cornell University’s College of Veterinary Medicine. Timoney returned to Ireland in 1981, assuming the position of scientific director of a planned Irish Equine Centre. Having helped establish the Centre, he returned to the U.S. in 1983 to join the faculty in UK’s Gluck Center. He served as department chair from 1989 to 2008 and director of the Gluck Center from 1989 to 2006. He is currently professor and holder of the Frederick Van Lennep Chair in Equine Veterinary Science.

Timoney is an internationally acclaimed expert in equine infectious diseases. His work over the years has consisted of significant research achievements as well as frequent consulting work for governmental, university and private organizations like the USDA, Hong Kong Jockey Club, KTA, among many others.

Timoney is an O.I.E. designated expert on equine viral arteritis, holding two of the three O.I.E. designations in the U.S. Among his current research interests is identifying the markers of pathogenicity among strains of equine arteritis

virus that can cause abortion and establishment of the carrier state in the stallion. He serves on numerous national and international equine industry and health-related committees and is a past president of the World Equine Veterinary Association. He has authored or co-authored more than 250 scientific publications.

Timoney is an honorary life member of the World Equine Veterinary Association and his awards include USDA Secretary of Agriculture Honor Award Recipient in 2001 and 2002; induction into the Gluck Equine Research Hall of Fame in 2009; Meritorious Service Award from the National Institute for Animal Agriculture in 2012; 2017 AAEP Distinguished Educator Award, Academic; Albert Nelson Marquis Lifetime Achievement Award in 2018; USDA Honor Award recipient in 2001 and 2002; and James J. Hickey, Jr. Award from the American Horse Council in 2018.

| *Holly Wiemers, MA, APR, is the communications and managing director for UK Ag Equine Programs.*

AAEP PUBLISHES CONTAGIOUS EQUINE METRITIS GUIDELINES

Comprehensive guidelines to assist veterinarians with identification, diagnosis and control of contagious equine metritis (CEM), a nonsystemic venereal disease of equines that causes short-term infertility in mares and rare abortion, are now available on the American Association of Equine Practitioners’ website.

Six outbreaks of CEM have occurred in the United States in the past 15 years, including a significant outbreak in 2008-2010 in which more than 1,000 exposed horses in 48 states were required to be tested, resulting in 23 contaminated stallions and five infected mares ultimately identified and treated.

“Outbreaks in the U.S. have demonstrated the risk of incursions and the need for surveillance in the active breeding population to identify cases early and limit disease spread,” said guidelines co-author Abby Sage, VMD, MS, Dipl. ACVIM, who is Richmond staff veterinarian for the Virginia Department of Agriculture and Consumer Services. “Several of these outbreaks also demonstrated significant stallion-to-stallion spread of *Taylor equigenitalis* via fomites and inadequate biosecurity during semen collection and stallion handling.”

Sage and co-author Peter Timoney, MVB, MS, PhD, FRCVS, the Frederick Van Lennep Chair in Equine Veterinary Science at the University of Kentucky’s Gluck Equine Research Center, advise equine practitioners and stallion owners/managers to follow stringent biosecurity protocols when collecting and handling stallions and consider implementation of annual testing of active breeding stallions prior to breeding season as ongoing assurance of disease freedom.

CEM is an internationally reportable disease. When the carrier status of a stallion or infection of a mare is suspected, practitioners should contact their state and/or federal animal health official, who will provide current collection and response procedures for suspect cases.

The CEM Guidelines were reviewed and approved by the AAEP’s Infectious Disease Committee and board of directors. View the guidelines or save them to your mobile device for future reference [here](#). Besides CEM, AAEP guidelines for 22 additional equine infectious diseases are available [here](#).

WARMER WEATHER MAY IMPACT EARLY FOALING MARE PASTURES

Horse farm managers with broodmares should carefully consider how recent weather conditions might affect tall fescue in pastures, potentially contributing to tall fescue toxicosis in early foaling mares.

According to Ray Smith, PhD, researcher and forage extension specialist in the University of Kentucky College of Agriculture, Food and Environment's Department of Plant and Soil Sciences, above-average temperatures and rainfall in the past several weeks have resulted in good pasture growth on horse farms across the region. While this is great news for many horse owners because it will prolong grazing and delay hay feeding, they should monitor the situation for early foaling broodmares.

"Typically, we don't worry about early foaling mares because the cold weather takes care of ergovaline concentrations. But the cold snaps we have had so far have been brief and quickly rebounded to above-average temperatures, keeping tall fescue green and growing into the winter months," Smith said.

Generally, ergovaline, the toxin produced by the endophyte commonly found in tall fescue, decreases rapidly once temperatures fall into the teens and grass growth is effectively stopped for the year. But because pasture grasses are growing deeper into winter than normal, this also means ergovaline production may continue. At the same time, other common pasture grasses like Kentucky bluegrass and orchardgrass are now dormant and therefore horses are less likely to graze them. Horses on pasture are likely consuming more tall fescue than they normally would in the spring and fall.

"Predicting when ergovaline concentrations will rise and fall is very difficult, so regular testing



PHOTO COURTESY DR. JIMMY HENNING.

is still the best method we have. Managers should consider testing the tall fescue in pastures where early foaling mares are currently grazing," said Krista Lea, MS, coordinator of the UK Horse Pasture Evaluation Program. "Pastures with less than 200 parts per billion ergovaline are likely safe for those mares."

According to Smith and Lea, broodmares are most affected by ergovaline in the last 60-90 days of pregnancy, so mares expected to foal before the first of March could be impacted by this unusual weather pattern and subsequent pasture growth. Pastures known to be higher in ergovaline in the spring and summer are more likely to be high now as well.

Mares negatively affected by ergovaline can have prolonged gestation, thickened placenta, red bag, poor milk production, dystocia and mare and foal mortality.

To reduce the risk to broodmares, horse owners and horse farm managers should feed hay and grain to reduce ergovaline concentration in the total diet or remove horses altogether from

pastures containing tall fescue in the last 90 days of pregnancy.

Local county extension agents can help with pasture testing and submitting samples to the UK Veterinary Diagnostic Laboratory for ergovaline quantification. Pastures under 200 parts per billion are unlikely to cause significant issues in broodmares and will likely remain low until the spring green-up. Levels observed in early December are unlikely to affect other classes of horses or cattle. Sample handling is key, so be sure to read [this publication](#) on how to correctly sample for ergovaline.

For questions, contact the UK Horse Pasture Evaluation Program at UKForageExtension@uky.edu.

| *Krista Lea, MS, is coordinator of the UK Horse Pasture Evaluation Program within UK's Department of Plant and Soil Sciences.*

DEMAND FOR WILD HORSES, BURROS STUDIED, AGE, COLOR AND HEIGHT PREFERENCES NOTED; TRAINING FOUND TO BE IMPORTANT

The number of wild horses and burros free roaming on western rangelands in the United States continues to greatly exceed the appropriate management level established by the Bureau of Land Management (BLM). In a 2019 statement, the acting head of the BLM indicated that private adoptions of wild horses and burros would be a key focus in regulating the population.

A simple tenet of economics is that markets are mechanisms to allocate resources, and of course a market consists a supply side and a demand side. Most of the focus on management of wild horse and burro herds has been on the supply side through research on population control through fertility suppression. Only a handful of studies have considered the demand side of the market.

Two recent and complementary studies conceived by Jill Stowe, PhD, professor of agricultural economics at the University of Kentucky, serve to fill that gap while assessing the feasibility of the BLM's recent focus. The first article, co-authored with Kathryn Bender, PhD, professor of environmental economics, Allegheny College Center for Business and Economics, and published in *Sustainability* (2019), investigates which characteristics of wild horses are most desired by adopters. The second article, co-authored with recent UK Equine Science and Management undergraduate student Hannah White, is currently under review for publication and explores characteristics of people who are most likely to adopt wild



PHOTO: ADOBE STOCK.

horses.

Bender and Stowe (2019) use data compiled from BLM online auctions held November 2012 through November 2014. The authors developed two models: one capable of predicting the likelihood of adoption, and the other estimating the adopters' willingness-to-pay for various horse characteristics. Results from this study suggest that a number of characteristics influenced the probability that a wild horse was adopted through an online auction. Older horses were less likely to be adopted, as were those that were born in captivity and had spent a longer time in captivity. Adopters seemed to have color preferences, with the less common coat patterns such as pinto, palomino, etc., increasing the likelihood of adoption relative to the more common base coat colors like bay and chestnut. Horses that had received some halter training as well as training under saddle were

more likely to be adopted. Interestingly, however, while a number of horse characteristics increased the likelihood of adoption, adopters were rarely willing to pay extra for those characteristics. Among horses at least 3 years of age, adopters are willing to pay almost 40% more for a pinto and about 20% more for a dilute as compared to a solid base coat color. Adopters were willing to pay at least 55% more for a wild horse that had received training under saddle but nearly 20% less for a horse that was born in captivity. Taken together, the results inform BLM herd management strategies in terms of the horses they select for adoption and the training provide to the horses.

Stowe and White (2021) begins with the initial assumption that current and previous horse owners in the U.S. represent the group most likely to be able to adopt a wild horse, and a survey was distributed through social media channels

to this group. Out of nearly 2,250 usable responses, less than 10% had never adopted a wild horse and would never consider doing so in the future. The remaining respondents were asked to identify which characteristics were important to them in selecting a wild horse and answer questions regarding the most they would be willing to pay for a completely unhandled horse, one that had received halter training, and one that had received training under saddle. Using those responses, we then estimated adopter characteristics that serve as determinants of willingness to pay. Previous adopters were willing to pay more than those who had never adopted before, and willingness to pay was typically monotonically decreasing across age groups. Those who own five or fewer horses were also willing to pay more. None of the other adopter characteristics, such as age, gender, income or state of residence

influenced willingness to pay. The average respondent in the sample was willing to pay about \$125 for his/her "ideal" untrained wild horse, just under \$300 for a horse that had received basic halter training and close to \$415 for a horse that had been started under saddle.

Results from these papers can be used to inform BLM's management strategies. Knowing that adopters have age, color and height preferences, BLM can select animals to be made available for adoption that are more likely to find homes. BLM can target younger horse owners with its marketing efforts. And both papers suggest that training, especially training under saddle, is a key component to private adoptions. We recognize that implementing a large-scale training program is not trivial. Training any horse, especially a wild horse, is expensive and risky, and many

respondents indicated that they didn't have the time or expertise to safely train a wild horse. And while both studies suggest adopters are willing to pay more for horses trained under saddle, it is noted that their willingness to pay falls short of actual market rates for training. Still, the BLM should carefully consider the tradeoff between the cost of training and keeping the horse for the duration of its life. Finally, continual efforts to educate horse owners about adopting a wild horse from the BLM will be important, as more than half of respondents reported little to no familiarity with the process.

| *Jill Stowe, PhD, is a professor of agricultural economics at the University of Kentucky.*

UK AG EQUINE PROGRAMS 2022 CALENDARS AVAILABLE FOR PURCHASE

The UK Ag Equine Programs' 2022 calendar will be available from county extension agents in Kentucky around the beginning of the year. Developed by the UK Ag Equine Extension Agent Working Group, the 12-month planning calendar is full of timely tips and resources for horse owners and horse farm managers. There is no charge for the calendars, but offices have a limited supply that are distributed on a first-requested, first-provided basis. Topics are presented the month before they are most applicable to give horse owners time to implement relevant practices.

Topics include, but are not limited to:

- feeding your horse
- body condition scoring
- weed control
- pasture seeding
- pasture rotation
- routine vaccination
- weaning foals
- testing hay
- soil testing
- winter blanketing
- hay feeders, forage
- water systems in winter
- mares and lights

Extension information for counties and associated agents can be found [here](#).



January

Equine Nutrition

Body Condition Score (BCS)

Healthy Foundations

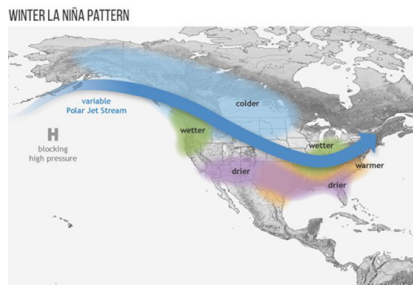
Equine Publications Available Online

2021 WINTER FORECAST AND CLIMATE TRENDS

Dec. 1 marked the start of meteorological winter, and that brings about the number one question to meteorologists everywhere: What will winter be like this year?

Obviously, we can't provide a perfect forecast, but we can give an idea based on previous years and worldwide climate patterns. Below is a look at the latest winter outlooks from the Climate Prediction Center. These maps hint at higher confidence in above normal temperatures and precipitation over the next three months for much of Kentucky. This DOES NOT mean the entire winter will be warm and wet. We'll still have some bouts of cold air and dry periods, but when looking at the winter as a whole, forecasters hint that the wet and warm periods will outweigh those drier and cooler periods. A sliver of Southeastern Kentucky is even in the "equal chance" category, meaning that chances are equal for near, above, and below normal precipitation.

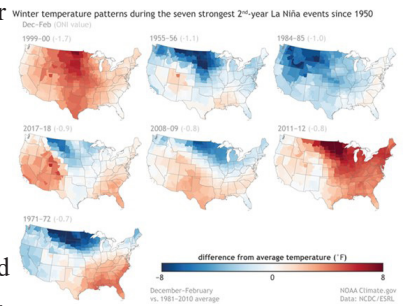
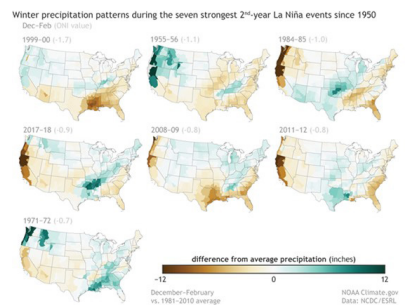
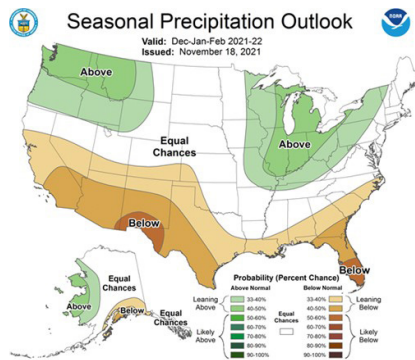
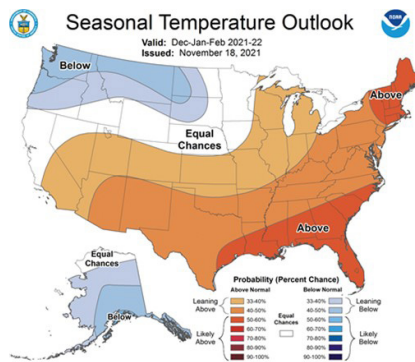
Darker shades on the maps above correlate to higher confidence. You can see that the shades across Kentucky aren't the darkest. This indicates the uncertainty in the forecast. The focus this year is on a "double-dip La Nina," meaning this is the second year in a row for La Nina conditions over the winter months.



"La Nina" is associated with the El Nino-Southern Oscillation (ENSO) climate pattern. The Southern Oscillation can take one of three phases: neutral, El Nino or La Nina. El Nino and La Nina phases are known for causing disruptions to large-scale weather patterns, such as the jet stream, most significantly during the winter months. La Nina is the cool phase and is associated with cooler sea surface temperatures in the equatorial Pacific Ocean. Below is a look at the conditions we expect across the United States during a typical La Nina winter. Here in the Ohio Valley, we typically see warmer and wetter conditions during a La Nina. Notice that this map is quite similar to the outlooks.

which discussed winter precipitation and temperature patterns associated with the second year of a double-dip La Nina.

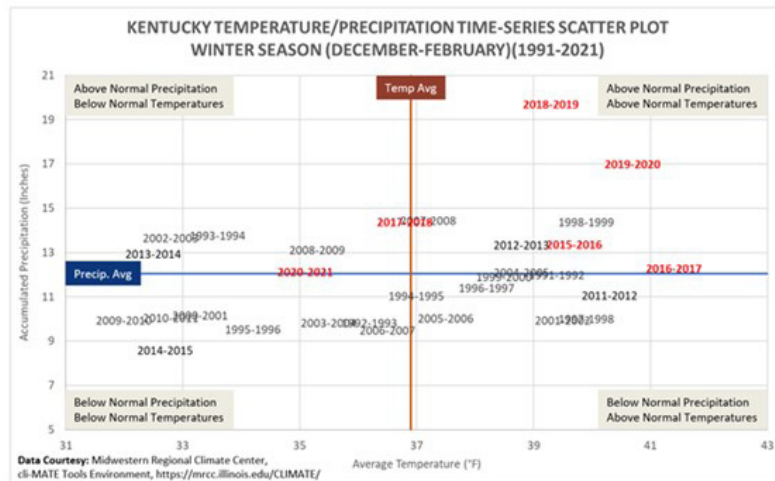
I included a look at the maps developed by climate.gov below. Most, but not all, of the time, we see wetter than normal winters in the Bluegrass State with a double-dip La Nina. Warmer winters have also been more prevalent than cooler winters. One caveat he pointed out: We don't have a lot of data on these double-dip La Nina episodes, since they have only happened seven times since 1950.



The problem is that La Nina for winter 2021-22 is considered "weak." So, the map above will most likely have deviations, which complicates the winter forecast further. The map above is most probable during "strong" events. I recently read a [great article](#) from Mike Halpert, deputy director of the NOAA Climate Prediction Center,

Our winters have been trending warmer and wetter over the past decade. This makes the warmer and wetter outlook a familiar scenario. Using data from the [Mid-western Regional Climate Center](#), I've looked at the temperature and precipitation statistics over the past 10 winters. Since our exceptionally cold winter of 2014-15, five of our past six winters have seen near to above normal temperatures.

The only exception came this past winter when a very cold and active February pushed us solidly below normal for the season. Overall, four of the top-10 warmest winters on record (data going back to 1895) have occurred over the past decade in Kentucky. 2016-17 sits at #2, 2019-20 at #5, 2011-12 at #6, and 2015-16 at #9. Looking at precipitation, Kentucky has now seen six straight winters of above normal precipitation. Some years have been much more significant than others. 2018-19 ranked as the 4th wettest winter on record, while 2019-20 was #12.



Kentucky Average Temperature & Precipitation Last 10 Winter Seasons (December - February)						
Winter Season	Temperature			Precipitation		
	Temp	Norm	Dep	Prcp	Norm	Dep
2011-2012	40.3	36.9	3.4	11.08	12.04	-0.96
2012-2013	38.8	36.9	1.9	13.34	12.04	1.3
2013-2014	32.5	36.9	-4.4	12.94	12.04	0.9
2014-2015	32.7	36.9	-4.2	8.59	12.04	-3.45
2015-2016	39.7	36.9	2.8	13.37	12.04	1.33
2016-2017	41.4	36.9	4.5	12.29	12.04	0.25
2017-2018	36.8	36.9	-0.1	14.38	12.04	2.34
2018-2019	39.3	36.9	2.4	19.71	12.04	7.67
2019-2020	40.7	36.9	3.8	16.99	12.04	4.95
2020-2021	35.1	36.9	-1.8	12.12	12.04	0.08

Data Courtesy: Midwestern Regional Climate Center di-MATE toolkit: <https://mrcc.purdue.edu/CLIMATE/>

I combined these two aspects of temperature and precipitation for the past 30 years in the time-series scatter plot below. Each year is plotted based on the average winter temperature and accumulated precipitation for that respective year. The graph is then divided into four boxes based on the 1991-2020 Kentucky temperature (red line) and precipitation (blue line) normals for the winter season. Here's how to understand the chart. Upper right: Contains any years with above normal precipitation and temperatures. Upper left: above normal precipitation and below normal temperatures. Bottom left: both below normal precipitation and temperatures. Bottom right: below normal precipitation and above normal temperatures. Then I highlighted the last five years in red. Outside of this past winter, the previous five have all hovered within or very close to that upper right box of above normal precipitation and temperatures

The warmer and wetter winters have proven impactful to Kentucky agriculture in a variety of ways. Based on the outlooks, we could be in for similar problems in winter 2021-22. Kentucky is in a good spot compared to other states in the northern plains when it comes to soil moisture, but that could come at a cost with a wetter-than-normal winter on the way.

One impact could be an overwhelming amount of mud. Below is a picture from Josh Jackson, PhD, a UK extension livestock systems specialist and livestock producer in Mercer County. He took this in February of 2019, which was the second wettest February in Kentucky history when the state averaged 9.39 inches. This was one of many mud-filled scenes that were observed that year; mud has become more prevalent with warmer and wetter winters in place.



Also see the photo of horses in mud to the right by Steve Higgins, PhD. Heavy mud can create a stressful environment for animals, causing feed requirements

to go up to maintain proper body condition. Luckily, hay production was high this year, with extended dry windows that were absent in recent years, especially 2020. Also, according to the latest [Kentucky Crop Progress and Condition Report](#) on Nov. 29, livestock condition is running predominantly in the good to excellent category. Despite that, a warm and wet winter could cause livestock issues.



With the prevalence of wet conditions over recent years producers may want to consider mitigation strategies. Jackson installed all-weather surfaces on his farm, specifically in feeding areas that see a lot of foot traffic. More information on siting and materials suitable for your own operation can be found in the following extension publication, [AEN-115 – Appropriate All Weather Surfaces for Livestock](#).

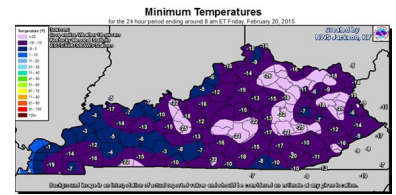
The potential for flooding also deserves monitoring. Kentucky, especially eastern portions of the state, got hit hard late last February and early March following intense

rainfall across the region. Warm temperatures combined with wetter winter climates and dormant vegetation is a recipe for more runoff. Livestock producers and horse owners need to prepare for the potential for flooding during the winter season. In the [Aug. 24 edition of the Ag Weather Update](#), I discussed several steps a producer can take to better prepare themselves for the threat of flooding. Be sure to take a look since now is the time to prepare.

In the end, winter forecasting is definitely not an exact science. Despite outlooks hinting at above normal temperatures and precipitation across the Lower Ohio

Valley, we'll still have our ups and downs through the year. Overall, it's good news. Combined with climate trends, the outlooks do hint we are NOT in for a VERY cold winter in the Bluegrass State. My parents always told me about the winter of 1978, but the winter of 2014-15 is my '78. February 2015 was the fourth coldest February on record. The coldest temperatures were seen on Feb. 20 when several across the state dipped between 10 and 20 degrees below zero (map below from NWS Jackson, Ky.). The Richmond, Kentucky, Mesonet station dipped to -32. That was only five degrees away from tying the all-time record low for Kentucky,

set in 1994 in Shelbyville. I don't know about you, but I'll definitely choose a warmer outlook over that kind of winter any day.

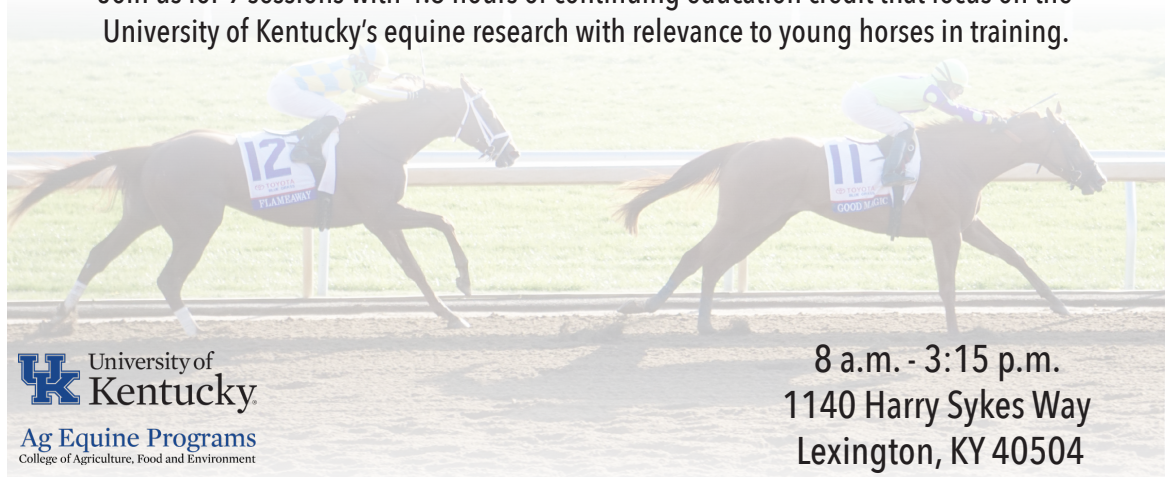


| *Matt Dixon, Meteorologist, UK College of Agriculture, Food and Environment.*

FRIDAY
JANUARY
28

The 11th Annual
EQUINE
RESEARCH
SHOWCASE

Join us for 9 sessions with 4.5 hours of continuing education credit that focus on the University of Kentucky's equine research with relevance to young horses in training.



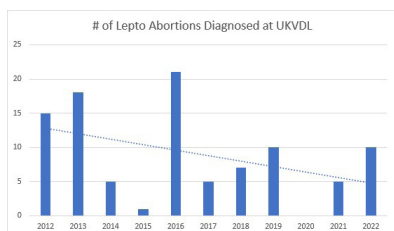
 University of
Kentucky
Ag Equine Programs
College of Agriculture, Food and Environment

8 a.m. - 3:15 p.m.
1140 Harry Sykes Way
Lexington, KY 40504

UKVDL CONFIRMED LEPTOSPIRAL ABORTION UPDATE

In a Dec. 22 bulletin, a time-frame past the mid-point of the 2021-2022 equine reproductive cycle, the University of Kentucky Veterinary Diagnostic Laboratory provided an update on confirmed leptospiral abortions submitted to the UKVDL by Kentucky horse farms.

As of Dec. 22, the UKVDL has confirmed 10 leptospiral abortions for the 2021-2022 foal crop. A 10-year plot of equine leptospiral abortions follows (a total of 97 aborted foals):

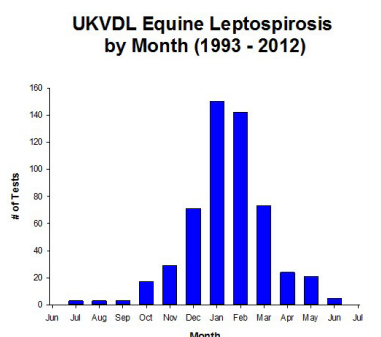


According to the bulletin, the first licensed vaccine against leptospirosis was released in the fall of 2015. Since that time, there has been a downward trend for the incidence of leptospirosis abortions based on UK VDL cases. To date, there have been no controlled studies to determine a statistical difference between farms that

are vaccinating versus those not vaccinating.

For the 2019-2020 foal crop, the laboratory confirmed zero foal abortions. According to laboratory archives, this has not happened for at least 20 years in Kentucky.

The UKVDL conducted a 20-year retrospective study on foal abortions diagnosed from 1993-2012 which identified 541 positive for leptospirosis (see the annual episodic curve by month below). A farm follow-up study conducted for foals aborted during the 2006-2007 foal crop determined that the average loss was \$189,000 per foal. Assuming that has not changed, the losses for the last 10 years would be \$18 million. Further studies are needed to reassess this data.



Those interested in following near-real-time data regarding leptospiral abortion and many other animal diseases identified in the laboratory, visit interactive mapping apps at the links below.

<http://vdl.uky.edu/Epidemiology-Information.aspx> – Home page, access to mapping and data for all species.

http://vdl.uky.edu:8080/informer/DashboardViewer.html?locale=en_US&embedToen=f6d47393-13ac-4ea0-b9e4-3d9f6fa0feb5 – Equine leptospiral abortions by county this year and past years.

| Information provided by *Jacqueline Smith, PhD, Epidemiologist, UK Veterinary Diagnostic Laboratory*

ALISA HERBST WINS CONFERENCE POSTER PRESENTATION AWARD

At the recent Conference of Research Workers in Animal Diseases (CRWAD), Alisa Herbst, PhD, a graduate student who recently successfully completed her doctorate in the laboratory of Amanda Adams, PhD, MARS Equestrian Fellow and associate professor at the University of Kentucky Gluck Equine Research Center, won first

place in the best poster presentation competition. Her poster entitled, “Pro-inflammatory cytokine responses to bacteria antigen LPS differ between young adult and old horses in vitro,” included some of the research she presented in her recently defended PhD dissertation. Congratulations to Herbst and team for winning this award.



GRADUATE STUDENT SPOTLIGHT: GLORIA GELLIN

Gloria Gellin, who recently completed her PhD under Craig Carter, DVM, PhD, Dipl. ACVPM, Director of the University of Kentucky Veterinary Diagnostic Laboratory, had a unique journey. “My interests have always been in veterinary medicine and animal health. I started my undergraduate work at Purdue University in pre-veterinary medicine but decided to transfer to Morehead State University’s vet tech program,” Gellin said.

After earning her AAS in veterinary technology from Morehead State, she completed her BS in animal science at UK. She became fascinated with microbiology after taking a class on the subject at Morehead State. This interest led her to UK once again for a master’s degree in microbiology. She then accepted a research position with the UK Department of Surgery.

Although she had considered pursuing a PhD, Gellin said she was not certain about this path until after meeting with Carter. Gellin began her MPH with a concentration in epidemiology under Carter’s guidance. While completing this degree, she also began working with the U.S. Department of Agriculture conducting research that focused on the impact of fescue toxicosis on the microbial population in the gut in livestock and horses.

“When I started working with

the USDA, I was already enrolled in my MPH program. My experience working for the USDA and completion of the MPH inspired me to continue my education and finally begin a PhD,” she said.

When asked about Carter’s impact on her education and research, Gellin said, “Dr. Carter played a significant role in my education and research throughout both my MPH and PhD. His interest in leptospirosis and his immense knowledge in animal health was an inspiration for both my MPH and PhD. I couldn’t have had a better mentor.”

This high regard was not one sided. Serving as the chair of her PhD committee and as a collaborator on several research projects, Carter said, “She is an extremely hard worker, driven by a high scientific curiosity for new knowledge. When given a challenge or a difficult task, she stays on target until it is completed, consulting with her superiors as needed along the way to be sure she is staying on track.”

The research Gellin accomplished while completing her degree is at the core of why she enjoys her career.

“When I began my master’s in animal science, I found how much I loved doing research. You may (or may not) answer one question; however, this always opens the door to many more questions. It can sometimes be very frustrating, but research for me is very exciting



PHOTO COURTESY GLORIA GELLIN.

and rewarding, which inspired me to pursue my PhD.”

Having recently completed her doctorate, Gellin said she is grateful for the people she has worked with along the way and that she remains passionate about her research. She plans continue to conduct impactful research in equine science and further the understanding of equine diseases.

| *Ryan Smith, a sophomore majoring in finance and marketing, is a communications and student relations intern with UK Ag Equine Programs.*

VISITING SCHOLAR SPOTLIGHT: HOSSAM EL-SHEIKH ALI

Hossam El-Sheikh Ali, BVc, DVM, MVSc, a visiting scholar in the laboratory of Barry Ball, DVM, PhD, Dipl. ACT, Albert G Clay Endowed Chair in Equine Reproduction at Gluck Equine Research Center, and a faculty member in Mansoura University, Egypt, continues to investigate equine placentitis with special focus on ascending and nocardioform placentitis.

This year, El-Sheikh Ali published one of his projects in the *Veterinary Research Journal*. In this study, he and his colleagues identified the genes and pathways associated with nocardioform placentitis. This study contributes to a better understanding of the disease pathophysiology.

El-Sheikh Ali and his colleagues published the first review article about Nocardioform Placentitis in the 67th annual convention proceedings of American Association of Equine Practitioners 2021, the world's most comprehensive con-

tinuing education event devoted to equine practice. This review provides up-to-date information about the disease, which is intended to provide a comprehensive review on nocardioform placentitis for veterinarians and farm managers.

Pouya Dini, PhD, a faculty member at University of California, Davis, and a former scholar with the Gluck's reproduction team, presented this review in the 67th annual convention of AAEP 2021.

Since there is no sensitive and specific biomarker available to diagnose and predict nocardioform placentitis, El-Sheikh Ali is investigating the equine serum proteomics during nocardioform placentitis compared to normal mares to identify specific serum biomarkers for nocardioform placentitis with subsequent development or validation of an ELISA or on-farm screening test to measure this biomarker(s) with subsequent improvement of



our diagnostic tools.

The full paper "Veterinary Research" can be accessed [here](#).

The full Review "AAEP 2021" can be accessed [here](#).

The Virtual Workshop on Nocardioform Placentitis can be found [here](#).

THE RECOVERY OF JOINT HEALTH — WHAT IS BEHIND IT?

The results of a team effort between researchers from the University of Kentucky Gluck Equine Research Center and the Virginia Maryland College of Veterinary Medicine were recently published in the prestigious journal *Frontiers in Immunology*. The study uncovers mechanisms that drive the resolution of the inflammatory process within equine joints. The

full publication can be found [here](#).

This effort was led by Bruno Menarim, DVM, PhD, a former equine surgeon in Brazil and Chile and now a postdoctoral scholar since 2020 within the Musculoskeletal Laboratory of James MacLeod, VMD, PhD, John S. and Elizabeth A. Knight chair and professor of veterinary science at the Gluck Center. Together with other

six researchers from the Gluck Center (Hossam El-Sheikh Ali, Shavahn Loux, Kirsten Scoggin, Ted Kalbfleisch, James MacLeod and Linda Dahlgren), this multidisciplinary study revealed molecular drivers of how immune cells called macrophages can drive the recovery of joint health following a severe inflammatory process.

Among the key findings:

- Immune mediators produced during the acute phase of inflammation are essential to set the stage for a response that efficiently fight aggressors, counteract damage and recover joint health.
- Pro-inflammatory mediators induce increased production of lipid mediators that counteract oxygen free radicals and resolve joint inflammation.

This study was sponsored by the Grayson Jockey Club, the Gluck Equine Research Center and the College of Veterinary Medicine at Virginia Tech.



THE SIXTH TEX CAUTHEN FARRIER / VETERINARIAN / RESEARCHER SEMINAR

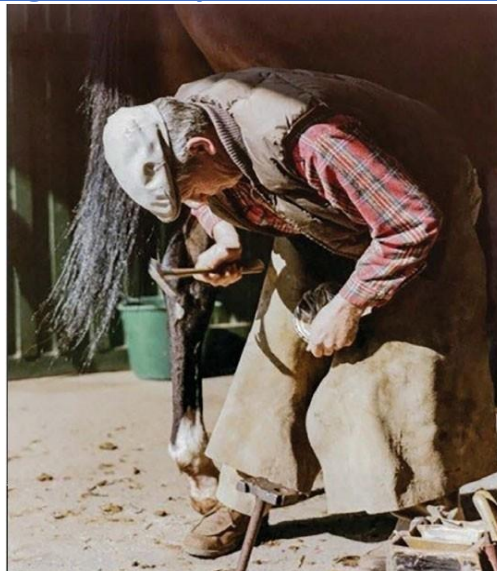
SUNDAY, JANUARY 23rd, 2022

THE SIXTH TEX CAUTHEN FARRIER / VETERINARIAN / RESEARCHER SEMINAR

**“PROTECTING THE HORSE, THE HOOF,
AND THE BIOMECHANICS OF THE HIND
LIMB” 9 a.m.-5 p.m.,**

**LIVE in the GLUCK Auditorium (Covid
permitting) and via ZOOM:**

<https://gluck.ca.uky.edu/2022-cauthen.ZOOM>



<https://gluck.ca.uky.edu/2022-cauthen.ZOOM>

KENTUCKY'S AGRICULTURAL ECONOMY THRIVING; RECORD RECEIPTS EXPECTED

University of Kentucky agricultural economists are predicting the state's 2021 agricultural receipts will exceed \$6.7 billion. If realized, this will be a new record, surpassing the previous record of \$6.5 billion in 2014 and the \$5.5 billion average over the past five years. They expect net farm income to approach \$2.5 billion, which is the highest since 2013.

Economists in the UK College of Agriculture, Food and Environment shared their predictions for the Kentucky agriculture and forest economies during the annual Kentucky Farm Bureau meeting. Kentucky's agriculture sectors powered through many challenges caused by the COVID-19 pandemic and are in the midst of tremendous economic growth due to increases in grain exports, strong crop yields and a high global demand for meats. As a result, corn and soybeans are tied with poultry as the state's top agricultural commodities in 2021. Each comprises 18% of all projected sales. Corn, soybeans and poultry are followed by equine, which had a strong sales season and has a 16% market share. Cattle is next with 11% of projected sales.

"In 2021, the equine market made a huge recovery, and Keeneland sales were up 35% from 2020," said Kenny Burdine, PhD, UK agricultural economist.

Kentucky's agricultural economy is consistent with national trends. U.S. farm exports will likely finish 2021 at record levels that approach \$175 billion. The U.S. Department of Agriculture is predicting a 23% increase in net farm income, which will only be surpassed by the all-time record high of \$123.7 billion set in



PHOTO COURTESY UK COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT.

2013. In 2020, producers' incomes increased by nearly 20%, mostly due to government payments from the Coronavirus Food Assistance Program designed to help farmers work through the challenges of the pandemic and the Market Facilitation Program payments to help export losses evolving from the trade war. While government payments are projected to be 40% lower in 2021, they continue to make up about one-fourth of U.S. net farm income.

"Despite the impactful events of the pandemic, the U.S. farm economy has not only survived, but has experienced remarkable growth, initially on the heels of government financial support, followed by significant export gains, impressive crop yields and a growing global demand for meat products," said Will Snell, PhD, UK agricultural economist.

Going into 2022, the economists predict commodity prices will continue to be relatively high but increasing input costs will tighten farmers' profits in the next year.

"Farm input costs will likely be up double-digit percentages in 2022, with much higher fuel, fertilizer and feed prices," Snell said. "Labor costs and supplies continue to be a concern, not only among farmers but throughout the entire food supply chain and the rest of economy. Farmers will be advised to monitor input and commodity markets closely in developing purchasing and marketing strategies amidst this turbulent, volatile, and uncertain farm economy."

| *Source: Edited Dec. 2 news release. Katie Pratt is an agricultural communications specialist with UK's College of Agriculture, Food and Environment.*