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## UK Ag Equine Programs Leadership Transitions to MacLeod

A familiar face is taking the leadership reins of University of Kentucky's Ag Equine Programs. James N. MacLeod, VMD, PhD, John S. and Elizabeth A. Knight Chair within the Maxwell H. Gluck Equine Research Center, is the program's new director—a repeat performance, as he also holds the distinction of being its very first leader shortly after the program's formation.

MacLeod assumed leadership Oct. 1 from Mick Peterson, PhD, faculty member with the College of Agriculture, Food and Environment's Department of Biosystems and Agricultural Engineering, who is transitioning exclusively into an industry-critical role of surface safety research and service. Peterson is considered the world's leading expert on track surfaces and surface testing and has spent the past several decades of his career implementing a robust surface monitoring and testing program. With the recent announcement of funding by The Jockey Club, Peterson will now focus on enhancing current testing capabilities and building a research program at UK devoted to surface safety advancements, including efforts that will come from the recently announced National Thoroughbred Racing Association grant.

MacLeod, who previously served as UK Ag Equine Programs director from 2008 to 2011, is also the director of the UK Equestrian Sports Research Initiative. He leads the Gluck Center's



James MacLeod, VMD, PhD

UK COLLEGE OF AGRICULTURE

musculoskeletal laboratory, work he's done for the past 16 years. His laboratory has gained national recognition in studying cartilage cell biology and through contributions to the equine genome project, focusing on the growth and maturation of articular cartilage, development and progression of osteoarthritis, and the repair of articular lesions.

"Academically and geographically, the University of Kentucky has every opportunity for continued national and international leadership in areas of equine science and scholarship," MacLeod said. "I am honored to serve as director of Ag Equine Programs. UK is quite unique with regard to the breadth and scope of faculty and staff expertise actively participating in equine programs."

"Our college continually strives to provide the very highest caliber of service to our equine industry," said Dean Nancy Cox, PhD. "We are becoming an equine safety resource to this global industry and consider ourselves incredibly fortunate to have top-notch faculty like Dr. MacLeod and Dr. Peterson to lead the way."

MacLeod earned his bachelor's degree from the University of Delaware and both his clinical doctorate in veterinary medicine and a doctorate in pathology from the University of Pennsylvania. MacLeod served as a regulatory veterinarian for the Delaware Racing Association and has had many productive research collaborations with leading veterinary clinicians over the years. He holds two patents.

He was awarded the Pfizer Award for Research Excellence in 1998, was co-recipient of the college's Prestigious Research Paper Award in 2009, served on the Morris Animal Foundation Large Animal Scientific Advisory Board from 2012 to 2015, and is currently on the Grayson-Jockey Club Research Foundation, Scientific Advisory Board.

MacLeod also co-teaches the capstone class within the Equine Science and Management undergraduate degree program. He currently advises four graduate students and a post-doctoral scholar in the Gluck Center. 

>Holly Wiemers, MA, APR, is the communications and managing director for UK's Ag Equine Programs.

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## Second Kentucky Horse Confirmed With West Nile Virus

On Tuesday, Oct. 15, the University of Kentucky Veterinary Diagnostic Laboratory (UKVDL) confirmed that a second Kentucky horse tested positive for West Nile virus (WNV). The 5-month-old Rocky Mountain Horse from Powell County presented on Oct. 9 with clinical signs including proprioception deficit with ataxia (incoordination) while standing and recumbency (down) with the ability to stand with assistance.

Due to signs compatible with WNV, veterinarians collected and tested a sample from the horse on Oct. 10. The horse, which had no WNV vaccination history, didn't respond to treatment, and its condition progressively worsened until it died. Officials confirmed the horse positive after tests detected WNV-specific IgM antibodies.

### About West Nile Virus

West Nile virus transmission occurs when infected mosquitoes feed on animals, as well as humans, after having fed on infected birds.

Clinical signs of WNV in horses include:

- Mild anorexia and depression;
- Fine and coarse muscle and skin fasciculation (twitching);
- Hyperesthesia (hypersensitivity to touch and sound);
- Changes in mentation (mentality), when horses look like they're daydreaming or "just not with it";
- Occasional drowsiness;
- Propulsive walking (driving or pushing forward, often without control); and
- Spinal signs, including asymmetrical weakness; and
- Asymmetrical or symmetrical ataxia.

West Nile virus has no cure; however, some horses can recover with supportive care. Equine mortality rates can reach 30-40%. The American Association of Equine Practitioners includes WNV as one of the core diseases all horses should be vaccinated against at least annually. [UK](#)

>Diane Rice is a freelance writer, editor, proofreader, and photographer living in Nampa, Idaho. She enjoys gardening, reading, and spending time with her daughters, grandchildren, and pets.



## Large Strongyle *S. vulgaris* Still a Risk for U.S. Horses

When thinking of internal parasites in horses, many of us quickly produce images of small strongyles or cyathostomins in our heads. This is understandable considering small strongyles are now the most common parasites in horses. That said, *Strongylus vulgaris*, the most pathogenic (disease-causing) of the large strongyles, shouldn't stray far from our thoughts.

"*S. vulgaris* remains one the most dangerous parasites for horses because the migrating larvae can cause blood clots and damage to arteries leading to the abdomen, which, in turn, could result in colic," said Jennifer Cain, MS, a PhD student and graduate research assistant in the University of Kentucky's Department of Veterinary Science. "While *S. vulgaris* has largely been eliminated in domestic horse populations thanks to the power of ivermectin, unmanaged populations, including wild and feral horses, are

## Masthead

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### ■ The Horse: Your Guide To Equine Health Care

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**LARGE STRONGYLE *S. VULGARIS***

still burdened by these parasites. When captured and adopted out, wild horses can serve as a reservoir for *S. vulgaris*.”

Cain reminded horse owners that with growing parasite resistance to deworming agents and no effective alternatives, exposing unmanaged horses to *S. vulgaris* poses potential risk.

To demonstrate the science surrounding this concern, Cain and co-workers collected fecal samples from 28 feral horses in Louisiana and 10 domestic horses living on nearby equine operations. They then performed fecal egg counts (FECs) and testing for *S. vulgaris* using a DNA-based analysis on samples from the horses. The researchers strategically dewormed the domestic horses—only those with FECs >200 eggs/gram of feces received a chemical dewormer as recommended by the American Association of Equine Practitioners.

The authors found that only five of the 38 study horses had negative FECs (were nonshedders), including one feral and four domestic horses. Overall, FECs were significantly higher in feral horses. Nonetheless, 50% of the domestic horses had FECs higher than 200 eggs/gram of feces, three of which were considered high shedders (i.e., FECs were >600 eggs/gram). In feral horses, however, 64.3% were considered high shedders.

“The number of domestic horses that underwent targeted deworming yet still tested positive is not surprising considering that domestic animals graze near their feces in confined areas,” said Cain. “Further, the goal of deworming horses is to reduce the number of parasite eggs shed in feces onto pasture rather than totally eliminate the parasites.”

The data also showed that while none of the domestic horses tested positive for *S. vulgaris*, 18 of the 26 (69%) tested feral horses were positive. Thus, while widely considered “eradicated,” *S. vulgaris* remains a real threat to horses in the U.S. As such, owners should quarantine new horses, particularly feral ones, to their properties and treat them for large strongyles before letting them commingle with resident horses.

Ideally, you should consult with your veterinarian when introducing any new horse into a population to address various health concerns, including deworming protocols, Cain said.

“In addition to providing information



**Quarantine new horses, particularly feral ones, and treat them for large strongyles before letting them commingle with resident horses.**

regarding risks associated with adopting wild horses, feral horses populations can provide information regarding natural parasite loads,” she said. “This data can help improve the management of domestic horses in a specific geographical region, especially in the face of dewormer resistance.”

The study, “Correlation between fecal egg count, presence of *Strongylus vulgaris*, and body score of feral horses on Fort

Polk, Louisiana,” was published in the August 2018 edition of *Veterinary Parasitology*, Regional Studies and Reports. The abstract is available free online. Co-authors included Katie Harisch, DVM, Kevin R. Macaluso, PhD, and Brandon E. Luedtke, PhD. **UK**

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## Tips for Preparing Older Horses for Winter

With the cold weather almost upon us, we must take into account several important considerations for preparing and maintaining older horses throughout winter. Some of the most important points to consider include body condition and nutrition, vaccination status, parasite control, dental and hoof care, housing, exercise, and health monitoring.

### Body Condition and Nutrition

Start by assessing your horse’s body condition score (BCS). Is he too thin, too fat, or just right? You must make the call now and feed appropriately to prepare for the winter months ahead. If you don’t feel comfortable making this call, involve your veterinarian or nutritionist in body scoring your horse. Get your hands on him as well, because a growing winter coat can hide a lot. Horses at a BCS of 5 or greater will have extra fat stores that can provide insulation during winter. Your horse should not be overweight for his breed, however, as insulin resistance (IR) could become a problem. If you are worried about IR, have your veterinarian perform an oral sugar test to diagnose the condition or simply check basal insulin levels for an indication of hyperinsulinemia (high blood insulin levels).

If your horse has a BCS below 5, increase his calorie intake slowly to improve his BCS score going into winter. If you are worried about putting weight on your horse because

## PREPARING OLDER HORSES FOR WINTER

of IR, or perhaps because your horse has pituitary pars intermedia dysfunction (PPID, also known as equine Cushing's disease) and you think he might be IR, it is best to not guess but instead have your veterinarian check your horse's insulin levels so you know it's safe to add calories to his diet.

In developing a feeding strategy for the horse that needs to put on weight, first consider increasing his hay intake to meet his energy needs. Hay gets digested in the gastrointestinal tract by fermentation, which produces heat the horse can use to maintain core body temperature. But there is a limit as to how much hay a horse can consume daily. In most cases horses will consume between 2.0-2.5% of their body weight (BW) per day. For example, if your horse weighs 1,000 pounds and is eating 2% BW per day, he should be consuming 20 pounds of hay per day.

Be sure to accurately weigh your hay and grain using a scale, because estimating can lead to under- or overfeeding. Allowing hay consumption throughout the day is important to provide the continuous calories your horse needs to keep up with the energy demands of staying warm when temperatures drop. Feed a good-quality hay that's free of mold, dust, and discoloration. Consult your county extension agent about hay sampling and



testing. An analysis will give you an estimate of energy content and can help you determine how to supplement effectively.

If your horse can't consume enough hay due to poor dentition, adding a grain concentrate and/or a fat source such as oil to the diet is important to provide enough calories.

Consider feeds designed for older horses, as most provide additional fiber and fat designed to meet their energy and health needs. In fact, University of Kentucky researchers conducted a study

in collaboration with Purina to determine if an Equine Senior formulation might reduce inflammation and improve older horses' immune responses to vaccination. The results were positive. Regardless the feed brand, this study is an important example of how quality nutrition can improve aged horses' health.

It is also important to provide a salt/mineral lick throughout the winter and be sure it's always available and not covered by ice or snow. In addition, adequate water intake ensures adequate feed intake. If possible, keep the water source warm to prevent freezing. Researchers have noted that water warmed to 39 degrees Fahrenheit (4 degrees Celsius) resulted in greater water intake. If your horse does not drink well during the winter, feeding water-soaked feeds (1 to 2 gallons of water per feeding) will help increase fluid intake. It is critical to monitor older horses' water intake. If your horse drinks less, he might eat less and, more importantly, be at an increased risk of impaction colic.

Overall, remember that you might need to increase your senior horses' daily feed to meet his body's increased demands during harsh winter weather conditions. Assess BCS regularly to ensure you've provided enough feed to maintain weight throughout winter. Consult your veterinarian, equine nutritionist, or geriatric horse specialist with specific questions.

### Vaccination Status

Cold temperatures can stress older horses and potentially set them up for illness. Here at the University of Kentucky we have shown that older horses have reduced immune responses to vaccination and are at risk for increased susceptibility to respiratory illness, in particular influenza (EIV). Moreover, we have shown that older horses with PPID are likely to have an even further reduced immune response to vaccination. Thus, make sure you maintain your old horses on a regular vaccination program. At the minimum, make sure they are up to date on core vaccines recommended by the American Association of Equine Practitioners. If you have a higher-risk senior (an older show, trail, or 4-H horse), consider having your veterinarian administer a booster for risk-based vaccines, including EIV, equine herpesvirus-1, and potentially West Nile virus, every six months, especially if your horses are showing or commingling with other showing horses during the stressful winter months. Consult your veterinarian with specific questions.



Allowing hay consumption throughout the day is important to provide the continuous calories your horse needs to keep up with the energy demands of staying warm when temperatures drop.

**PREPARING OLDER HORSES FOR WINTER**

**Parasite Control**

Parasite control is an important part of caring for and managing horses. We conducted an experiment to evaluate whether aged horses demonstrate statistically higher fecal egg counts (FEC) compared to middle-aged adult horses and to investigate whether they respond differently to the dewormer moxidectin than horses treated with pyrantel pamoate. The study's results indicated that old horses have significantly higher FEC than middle-aged adults. FECs declined significantly following anthelmintic treatment in both age groups.

In summary, older horses are likely to harbor more parasites; however, it is important to perform FECs to determine if your older horses fall into this category. In our hands, both dewormers were effective at reducing FECs, but test your dewormer's efficacy, and use ones that work on your farm. It might be beneficial to deworm your horse after the first frost and perhaps two to three times per year. Again, let the FECs tell you what is appropriate for your farm. It is also wise to involve your veterinarian in your deworming program.

**Dental and Hoof Care**

Have your veterinarian examine your older horses' teeth at least twice a year. One of these exams should happen in early fall. Normal dental care will help your horse chew and consume hay adequately, which will allow him to utilize the energy sources needed to stay warm and maintain body weight. This is especially important for older horses that tend to drop grain or quid (store a bolus of food in the side of the mouth, or drop food after a few bites). Proper dentition will also help prevent problems such as choke and colic.

Keep your horse on a schedule when it comes to hoof care. You might consider pulling or changing his shoes to prevent slipping on winter ice or adding borium and/or snow pads to protect the sole from bruising due to ice or frozen ground. Your choice depends on winter's effects on your terrain. Most importantly, clean your horses' feet daily to remove ice accumulation or what we call "snowballs."

**Shelter and Blanketing**

Providing shelters or wind breaks such as a barn, three-sided shed, rolled

bales of hay, or plywood on fence rows is critical for older horses. Keep these areas dry, clean, and well-ventilated. Providing shelter will help older horses tolerate more severe weather temperatures and might help reduce their energy requirements slightly.

Consider blanketing the senior horse when temperatures or wind chill drop below 5 degrees Fahrenheit if there is no shelter available, a chance the horse will become wet (not usually a problem with snow, but much more of a problem with rain, ice, and/or freezing rain), the horse is body-clipped, the horse has not been acclimated to the cold (i.e., recently relocated from a southern climate), or the horse has a BCS of 3 or less.

If you do blanket your horse, make sure it fits properly. If the horse is blanketed continuously, remove the blanket daily

to check that no sores or skin conditions have developed and to inspect the blanket for damage. Keep blankets dry, and do not blanket a wet horse; wait until he is completely dry before blanketing. Keep in mind a horse will continue to develop a natural winter coat until late December, while days become shorter. Thus, blanketing before Dec. 22 will decrease a horse's natural winter coat.

**Exercise**

Low grade, non-intensive exercise is important for the aging horse. In fact, in human medicine researchers have shown this type of exercise to be anti-inflammatory for seniors, which might impact or improve age-related conditions such as arthritis. During winter, it is important to prepare your horse for exercise with ample warmup and cool-down. Cool

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the horse out completely with the help of coolers. Warm the bit before bridling him. Use common sense when judging riding conditions, as older horses do not adjust well to stressful conditions.

**Health Monitoring**

Because older horses face changes that naturally occur to the immune system with increasing age, it is important to monitor them more closely for health conditions you might not have considered previously, including respiratory illness, skin conditions, signs of colic, and arthritis. We have shown that as horses age, a phenomenon called inflamm-aging occurs, defined as low-grade, chronic inflammation. We have also shown that season impacts levels of inflammation

**Use common sense when judging riding conditions, as older horses do not adjust well to stressful conditions.**

and that these levels are quite high during winter. Currently, we have ongoing research to determine safe, effective levels of natural anti-inflammatory treatments that might help reduce this inflamm-aging, thereby improving age-related conditions such as arthritis. It is important to consult with your veterinarian and establish a therapy plan so you can optimize your horse's mobility during winter.

**Summary**

In preparing for winter, make sure your horse is up to date on vaccinations and deworming and is maintaining a proper body condition score. During winter you should provide your horses with warmed water, additional hay and/or concentrate during extreme cold, access to shelter, regular hoof and dental care, and regular body condition assessments. Also evaluate your shelters and their ventilation frequently. Horses, given the opportunity to acclimate to cold temperatures, often prefer and are better off outdoors with access to shelters. **UK**

>Amanda A. Adams, PhD, assistant professor and equine immunologist specializing in geriatric horse medicine in the Gluck Equine Research Center provided this information. She can be reached at amanda.adams@uky.edu.



**Kentucky bluegrass is a low-growing, sod-forming, cool-season grass.**



**Kentucky bluegrass seedhead**

**The Grass Guide: Kentucky Bluegrass**

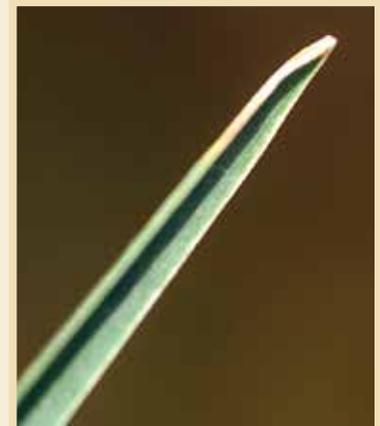
- Name:** Kentucky bluegrass (*Poa pratensis* L.)
- Life Cycle:** Cool-season perennial
- Native to:** Europe
- Uses:** Pasture
- Identification:** Boat-shaped leaf tip

Bluegrass is synonymous with Kentucky and for good reason. Kentucky bluegrass is well-adapted to the cool, humid growing conditions found in Kentucky and throughout the transition zone of the Eastern United States and most northern states. It grows well in a wide variety of soils.

Kentucky bluegrass is very winter hardy but does not tolerate hot, dry summers found further south. It is low-growing and, therefore, low-yielding. As such, it is not an ideal forage for hay, but it is excellent for horse pasture. It is highly nutritious, very palatable, and tolerant of close, frequent grazing. Kentucky bluegrass also forms a tight sod, providing good pasture footing. This grass species is slower to germinate than most cool-season grasses, taking seven to 21 days.

Detailed seeding dates and rates can be found in the Grain and Forage Crop Guide for Kentucky (AGR-18) at [www.uky.edu/ag/forages](http://www.uky.edu/ag/forages) or by contacting your local county Extension office. **UK**

>Information provided by AnnMarie Kadnar, graduate student; Krista Lea, MS, coordinator of the University of Kentucky (UK) Horse Pasture Evaluation Program; and Ray Smith, PhD, professor and forage extension specialist. All three are part of UK's Department of Plant and Soil Sciences.



**Kentucky bluegrass is easily identified by its dark, narrow leaves with tips shaped like a boat's bow.**

## Why Is My Previously Dewormed Yearling Pooping Parasites?

**Q** I recently purchased a yearling from reputable breeders with more than 50 years of experience. They administered an oxibendazole dewormer days prior to shipping him to me. They have a program where the babies are dewormed every two months up to the age of 1. He was just turning 1 when I got him.

He's healthy and active, and I was unconcerned about him being wormy. I give my horses ivermectin in September every year, and although I didn't do fecals this year, they have been clean in prior years. My vet had told me I don't need to give wormer to my other horses (not the yearling), but I still give ivermectin anyway once a year.

I included this yearling in the administration of the ivermectin about 13 weeks after he arrived. I was shocked to find dead ascarids—lots of big long ones—in his manure piles the next day, and there were dead worms present for about a week. I am grateful with that worm load that I didn't cause a colic.

How long is ivermectin working to kill worms in my horses? I'm getting a fecal done on the yearling. What wormers are actually effective?

*S.B., via email*

**A** Yearlings are definitely more prone to harboring parasites in high numbers than mature horses. While ascarids are generally regarded as foal parasites, it's not unusual to observe a second wave of infection during the yearling year. What's unusual in your case

is that the ascarids appear to be sensitive to ivermectin. This is somewhat surprising given that ivermectin resistance is reported to be widespread in equine ascarids around the world.

Now, resistance rarely means zero effect. Instead, it means the effect is lower than historic levels. I say this because you only see the dead worms coming out, and we don't know if some are still left inside. Given that resistance to ivermectin is so common in ascarid parasites, it's definitely worthwhile to check a fecal sample for ascarid eggs to make sure. If your yearling comes back ascarid positive, I recommend treatment with a benzimidazole, as we see very little resistance to this drug class. Pyrantel pamoate paste products are also most often effective, although a few cases of resistance have been reported. In general, it's recommended to periodically check for treatment efficacy with fecal egg counts before and after treatment.

Interestingly, your yearling was treated with an oxibendazole (a benzimidazole drug) product just prior to moving to your facility. It's important to keep in mind that even if no resistance has developed, benzimidazoles in a single dose only work against the worms in the intestine and do not work against larvae migrating through the liver and lungs. So, it's still possible your yearling could have carried some ascarid larvae at that time and these have now developed into adults. But before you conclude that the breeder's deworming program is ineffective, keep in mind that



COURTESY S.B.

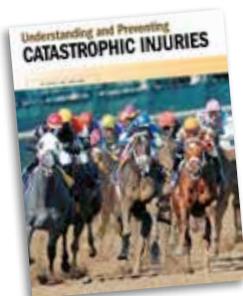
The yearling's manure after deworming.

equine ascarids can develop from egg to adult in 10 weeks. Since you encountered the worms 13 weeks after the yearling arrived at your facility, it is possible he got infected after moving to your facility. But that would mean at least one other horse at your facility is infected with ascarids and actively shedding eggs.

To answer your other question, ivermectin reaches its effect within 24 hours and is out of the system within a couple of days. You observed dead worms excreted for several days because adult ascarids live in the upper part of the small intestine, from which it's a long way out. Ivermectin works by paralyzing the worms, so they slowly lose their ability to swim against the stream and are carried down the intestinal tract to finally make it out with the feces. Sometimes the worms even take a detour to the bottom of the cecum and back, which can take an extra couple of days. **UK**

>Martin Krarup Nielsen, DVM, PhD, Dipl. ACVM, is an associate professor of parasitology and the Schlaikjer professor in equine infectious disease at the University of Kentucky's Maxwell H. Gluck Equine Research Center, in Lexington.

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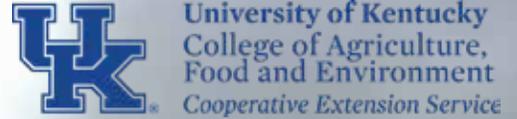


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