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## Growing Pastures From the Ground Up

**B**y all measures the early spring of 2018 in many areas of the U.S. was uncharacteristically wet, and significant damage occurred in many horse pastures. This damage will heal in time, but prevention is best accomplished by growing healthy pastures supported by strong roots.

### How Grasses Grow

Grass growth isn't overly complicated, but it's an important concept to understand when you're managing horse pastures. So, here's a very basic refresher course from the experts.

Grasses absorb sunlight in their leaves and produce energy from photosynthesis. This energy is either used for growth or stored in the roots as carbohydrates. When grass is grazed (or mowed) leaves are removed, reducing the amount of light the plant can absorb and energy it can produce. To recover, grasses use carbohydrates



Strong roots, developed by sound pasture management, would reduce the impact of traffic on the pasture, providing better footing and more grazing.



The orchardgrass plant on the left was clipped to one inch each week for four weeks to simulate continuous grazing. The plant on the right was clipped at 3 1/2 inches monthly to simulate rotational grazing. Both were then allowed five days to regrow. The rotationally grazed plant had more root reserves and was able to recover, while the other was depleted of nutrients and struggled to produce any regrowth.

Watch a video of this experiment at [vimeo.com/250838176](https://vimeo.com/250838176).

from the roots to regrow their leaves. But this comes at a price: Roots physically shrink as these carbohydrate reserves are used up. Once the leaves are able to absorb adequate sunlight for photosynthesis, the root reserves are replenished. This normal process allows grasses to recover from grazing and thrive.

### How Horses and People Affect Grass Growth

In ancient times, wild horses and other grazing wildlife roamed over large areas, meaning they didn't graze the same plants repeatedly. This gave each grassland area a chance to recover before being grazed again.

However, most horses today are confined to much smaller spaces (i.e., pastures) and, thus, graze the same areas over and over. In fact, horses do this more than cattle or other livestock, as they prefer the short, tender leaves associated with new growth rather than the long, stemmy forage found in established plants. Repeated grazing eventually depletes root reserves. With no energy left to grow new leaves, the

plant dies. And during wet weather, such as what we've experienced this spring, anything from hooves to tractor tires can sink down into the soil, damaging roots and reducing carbohydrate reserves.

The bottom line is healthy pastures need healthy roots. Think of the soil surface as a mirror: Whatever you see above the ground is also what's below. Pastures with tall, thick grasses will also have robust, healthy roots. These will hold the soil down during heavy rainfall, withstand hoof and tractor traffic better, and survive longer in droughts. Conversely, thin, short,

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## Growing Pastures

overgrazed pastures have shallow, sparse roots and are more vulnerable to damage from traffic, drought, and grazing.

### Improving Pastures by Encouraging Root Development

Pasture managers can take simple steps to develop a healthy root system and, in turn, a more resilient and productive pasture.

**Use rotational grazing.** Rotating horses between pastures gives grass time to recover from grazing. This can be as simple as moving horses to new paddocks every few weeks or even dividing a larger pasture in half. In time, increase the number of paddocks to give each one a longer rest period. [Learn more about rotational grazing here.](#)

**Mow less and cut grass high.** In rotationally grazed pastures, mow after removing horses from a pasture to even out the grass heights, usually around 4 inches. Allow pastures to grow up to 6 to 8 inches before grazing again. In continuously grazed systems, mow no lower than 6 inches and only when grass or weed seedheads are emerging.

**Fertilize pastures.** Nutrient availability can limit pasture growth. Soil test pastures every two to three years, and apply any needed fertilizers per recommendations. Submit soil samples

to your local county extension office, or work with the local farm store where you buy fertilizer to determine what your pasture needs to thrive. [Learn more about soil sampling and fertilizing here.](#)

**Install high-traffic area pads.** Some areas where traffic is frequent, such as around gates, waterers, and feeding areas will never maintain grass cover. Consider installing geotextile fabric under dense rock pads to reduce soil erosion and provide solid footing year-round. [Learn more about high-traffic area pads here.](#)

**Designate a sacrifice area.** Sacrifice areas are just what the sound like: small areas that are sacrificed to protect larger pastures. Remove horses from pastures during periods of heavy rainfall or low growth (such as winter) to prevent damage, and confine them to the sacrifice area, knowing that it will have little or no cover. This could be a drylot with horse-safe gravel footing or simply a turnout paddock that's allowed to be abused.

Good pasture management starts below the soil and results in strong, resilient pastures that can feed horses and provide safe footing, reduce the cost of horse ownership, and protect natural resources. [UK](#)

>Krista Lea, MS, is a research analyst and coordinator of the University of Kentucky (UK) Horse Pasture Evaluation Program.

## Masthead

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## All About Feeding Horses Alfalfa

In some areas of the country, alfalfa is a regular part of life. It's readily available, so it's a logical foundation for many horses' diets. In other areas, it is a delicacy of sorts, shipped in from different regions and bought a bale at a time on a vet's recommendation to help certain horses that need nutritional support. For some types of horses—in either of those areas—alfalfa simply isn't a great choice. And, so, that fragrant green bale comes loaded with nutrients and, for some horse owners, a multitude of misconceptions.

Whatever your experience, we're here to tell you everything



Alfalfa is more nutrient-dense than grass hay harvested at the same stage of maturity.

## All About Alfalfa

you need to know about this forage, starting with a little bit of history, and clear up any confusion about it.

### Alfalfa Goes Way Back

Forage for horses can be divided into two categories—grasses and legumes. Grasses you're likely familiar with include orchardgrass, timothy, and bermudagrass and are long and stemmy. Forage legumes, such as clover and alfalfa, are members of the pea family and, so, are cousins of peanuts.



ALEXANDRA BECKETT/THE HORSE

Because it's so nutrient-dense, alfalfa is a good feed for underweight horses.

"Alfalfa is a perennial legume, grown in most regions of the U.S. for horses and other livestock," says Krishona Martinson, PhD, associate professor and equine extension specialist in the University of Minnesota's Department of Animal Science, in Falcon Heights.

It was one of the first domesticated forages, planted and harvested in what is now Iraq, Iran, and Afghanistan several thousand years ago. Early farmers discovered its nutritional benefits, especially for hard-working horses, says Ray Smith, PhD, UK forage extension specialist. "The main feed for horses of early armies in those regions was alfalfa," he says.

"When alfalfa was first brought to the eastern part of the U.S. in the 1700s from Europe, it didn't survive well—partly because of wetter soils and lower pH," says Smith.

By contrast, when settlers brought alfalfa west in the 1800s during the California Gold Rush to grow livestock feed, it did quite well. "Use of alfalfa grew rapidly in the western U.S. as people realized it fit well with that climate" and less-acidic soil types, says Smith. "By the late 1800s and early 1900s we began

to learn more about adding lime to low-pH soils, to make them more appropriate for growing alfalfa. Plant breeding was also beginning by the 1900s, and plant scientists were able to develop alfalfa plants that were better adapted to various soils in the U.S." Modern plant breeding has also improved this legume's disease resistance.

Today, alfalfa still grows best in well-drained soils rather than wet soils.

### Which Horses Benefit From Alfalfa?

"The biggest benefit of alfalfa for horses is that it tends to be more nutrient-dense than most grasses when harvested at the same stage of maturity," says Martinson. It typically contains more digestible energy, more crude protein and calcium, and fewer nonstructural carbohydrates (sugars and starches).

Because it's so nutrient-dense, it is a good feed for underweight horses.

"It can also be beneficial to horses with muscle problems that are prone to tying-up (due to their increased protein needs) or horses with equine metabolic syndrome (EMS) due to the lower amount of nonstructural carbohydrates," says Martinson.

She says alfalfa is ideal for horses on high planes of nutrition, such as lactating broodmares, growing horses, thin horses, racehorses, performance horses, or foals that aren't getting enough milk.

"With growing horses, however, use caution in amount fed, simply so they don't grow too quickly or get too big too fast and become at risk for DOD (developmental orthopedic disease)," Martinson says.

We know that for horses sensitive to sugar or carbohydrates (e.g., horses with insulin resistance, pituitary pars intermedia dysfunction, etc.), building a diet on a good foundation of forage is especially important—the oats, corn, and barley that make up many feeds are 55-75% carbohydrate.

Some grass hays are also too high in sugar for these horses, and this is where a legume diet or mixed legume/grass diet can help lower total sugar intake.

Choosing the right hay for proper balance can be challenging, however.

For instance, an overweight insulin resistant horse needs a lower-sugar hay (the alfalfa), says Martinson, but not the additional calories, "So we often end up doing a mix where those horses receive

## Beware of BLISTER BEETLES

These flying insects—dead or alive—contain the toxin cantharidin, which can kill a horse if consumed in large amounts. Blister beetles feed on alfalfa blossoms and might swarm fields during harvest. Beetles killed by the haying equipment can end up in the hay.

Adult blister beetles emerge in June (sometimes a little earlier or later depending on the region and climate) to feed on alfalfa blooms. "These beetles tend to be more prevalent in late summer," says Ray Smith, PhD, UK forage extension specialist. "The first (and sometimes second) cutting of alfalfa almost never contains blister beetles because it is generally cut and baled ahead of when the adult beetles emerge."

Years following drought typically see more blister beetles, as do central states such as Kansas and Oklahoma.

When purchasing hay, examine a few bales to see if the alfalfa has blooms. "If you always check the hay as you feed it, you can discard those bales or flakes that contain beetles," says Smith. "The beetles will be very concentrated; if you find one or two you will usually find many." He adds that 99% of bloomed hay won't have beetles in it.

"Alfalfa producers who market hay for horses are aware of the issue of blister beetles," he says. "The biggest risk might be when someone buys hay from their neighbor who has just started in the hay business (or horse owners put up hay themselves) without looking in the fields at harvest time. Always follow the recommendations in your state regarding scouting for and controlling blister beetles."

—Heather Smith Thomas

Blister beetles produce a caustic oily compound called cantharidin, which can cause horses to become sick or die.



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## All About Alfalfa

some legume and search for a low-sugar grass hay to mix with it.”

“Many horse owners buy bales of alfalfa and bales of grass hay and feed several flakes of grass hay and one flake of alfalfa” as needed, says Krista Lea, MS, UK forage extension specialist and research analyst. This can offer some cost savings if you also have horses that do fine on the less-nutrient-dense hay.

“I have three horses with different nutrient requirements, so if I have different kinds of hay I can mix them appropriately for each horse—to get the right balance for what they need,” she says. You can add alfalfa pellets or cubes

to a grass hay diet for the same effect.

Alfalfa is also suitable for horses prone to gastric ulcers, because the extra calcium acts as a buffer against stomach acid. You might offer performance horses alfalfa an hour or two before work or competition, during which acid can splash up into the nonglandular part of the stomach (where the cells of the lining do not produce protective mucus). The simple act of chewing creates more saliva, which also helps buffer stomach acid, says Lea.

Owners might also offer the legume to horses needing to develop more muscle, particularly along the topline. Stephen Duren, PhD, of Performance Horse Nutrition, in Weiser, Idaho, says this is because alfalfa provides amino acids

needed for muscle regeneration. “We see this practice more in the East where a lot of marginal grass hay is fed.”

### Which Horses Should Not Eat Alfalfa?

Some owners believe alfalfa makes horses “hot,” but Martinson says there’s no scientific basis for this. “(It) does have more energy compared to grass hay of similar maturity, so perhaps a horse eating a lot of alfalfa in the absence of exercise may have more energy,” she says. “The biggest issue with alfalfa is weight gain in horses that don’t have adequate exercise.”

Additionally, it supplies more nutrients than most nonworking horses need, leading to obesity and its associated issues. So feed overweight horses or easy keepers just as you would the sugar- or carb-sensitive ones—offer them a mature grass hay with lower caloric content over a rich legume.

Alfalfa is a good source of nutrients for sport horses, but owners might want to avoid offering it when horses are working hard in hot weather, says Duren. Protein metabolism creates more heat than fat or carbohydrate metabolism. This added heat can impair the horse’s ability to dissipate heat. He might even suffer from dehydration (due to extra sweating and increased urination from the alfalfa breakdown/flushing from the kidneys) and be more likely to experience heat stress.

“Extra protein cannot be stored in the body like extra fat or carbohydrates and must be excreted,” says Duren.

A horse eating more protein than the body can use will also drink more water (to help flush out the additional waste products). This creates more urine and, thus, more ammonia odor.

“Ammonia in stalls can irritate airways and make horses susceptible to respiratory problems,” says Duren.

While feeding extra protein is wasteful, a high-protein diet in itself does not hurt a healthy horse. It can be detrimental, however, to horses with impaired kidneys or liver. These individuals have problems processing and excreting protein and should be kept on a very low-protein diet.

Duren also doesn’t recommend feeding straight alfalfa to endurance horses due to its protein and calcium content. The last thing you want on an endurance ride where the horse is sweating for long periods is the increased body

## GRAD STUDENT SPOTLIGHT

### NAME: ELIZABETH BOUDAHER

From: Sydney, Australia

Degrees and institute where received: BS in animal health and disease, minor in animal nutrition, honors in animal and veterinary bioscience, University of Sydney, Australia.

Upon completing her undergraduate degree, Elizabeth Boudaher decided to take a year off to work in the animal industry. During that time, she consulted with her research supervisor about her options in pursuing a doctoral degree in equine microbiology, the focus of her undergraduate research project.

“He informed me that the best places to study were Melbourne, Ireland, and Kentucky,” she said. “With Lexington being the ‘Horse Capital of the World’ and with UK having the Gluck Equine Research Center, it only made sense to pick UK.”

Boudaher is working under the direction of Carrie L. Shaffer, PhD, assistant professor at the Gluck Center, and is applying next-generation sequencing technologies to study how *Rhodococcus equi* interacts with horse immune cells to cause disease and to catalog the repertoire of virulence determinants.

When asked what her most valuable takeaway from the program is so far, Boudaher said, “The most valuable lessons really come from the research component of the PhD program.

“Not only do you learn so many new things as you obtain results but you also learn about yourself,” she said. “Research is very finicky, so when things go right, it’s an amazing feeling. But when things go wrong, and they will, you are presented with an opportunity to learn from your mistakes and how to cope with failure.

“For me, the most valuable takeaway, and one of the most important traits to have in research, is to be confident in your abilities even when things aren’t going the way that you would like them to,” Boudaher said.

Boudaher expects to graduate in 2021 and plans to obtain a postdoctoral position within equine microbiology to further refine her scientific skillset and expand her knowledge base. **UK**



>Alexandra Harper, MBA, is the operations and communications coordinator for the UK Ag Equine Programs.

## All About Alfalfa

heat, water needs, and urine production described. High levels of calcium, on the other hand, can interfere with the horse's ability to mobilize bones' calcium stores during exercise. Endurance athletes can benefit from small amounts of alfalfa, just like any other performance horse, says Duren, but make sure it's not their sole forage source.

"Many performance horses are not worked to the point of dehydration, so they can handle a higher percentage of alfalfa," he says. "In California there are many cutting, reining, and other performance horses that eat a lot of alfalfa hay (due to its wide availability) and balancer pellets, and that's their entire diet and they do fine."

**"A lot of owners are intimidated by alfalfa and think they shouldn't feed it, but it's a great feed for horses."**

DR. KRISHONA MARTINSON

Other horses that do best with limited alfalfa are horses with the genetic muscle disease hyperkalemic periodic paralysis (HYPP). These horses are affected by hyperkalemia, or an excessive amount of potassium in the blood, which causes their muscles to contract more readily than normal and makes them susceptible to sporadic episodes of muscle tremors or paralysis. These horses are particularly sensitive to alfalfa's high potassium content.

"Potassium levels in forage are dependent on what the plants are pulling out of the soil, however," says Duren. "It can make a difference how and where the alfalfa was grown and whether it was fertilized with manure—which really drives the potassium levels higher. If I had a horse that was sensitive to potassium, rather than exclude alfalfa per se, I would have the hay analyzed. Not all alfalfa hay is really high in potassium, but you have to test it to find out."

Some horses with unpigmented skin should not eat alfalfa because they could be prone to photosensitization caused by black blotch disease, says Martinson. This is a mold that causes black blotches on the undersides of the leaves of legumes, including alfalfa. "Horses ingesting this mold may experience excessive sunburn—which seriously affects unpigmented areas of their bodies," she says.

The more serious issue with these horses, however, is the liver damage from the toxins in the mold.

### Selecting Alfalfa Hay

When looking for good-quality alfalfa, be sure it's clean with no dust or mold—just as you would with any hay. Also aim for a good leaf-to-stem ratio (most of the nutrients are in the leaves; the stems are more fibrous). "It should be a green color, meaning there are more leaves and the hay is not weathered or rained on before it was put up," says Smith.

If your horse doesn't need pure alfalfa's high nutrition value, look for a grass/alfalfa mix. To determine the nutrient content of any hay, have it tested. Maturity, harvest conditions, soil conditions, and more can affect protein, energy, and mineral levels, says Smith.



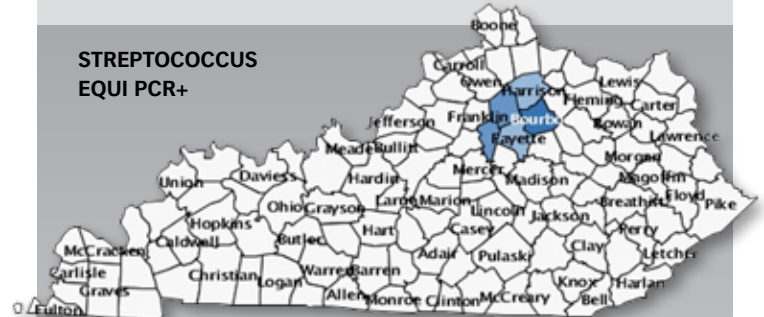
## Streptococcus equi

This month's featured map is *Streptococcus equi* subspecies *equi* (*S. equi*), the causative agent of the equine bacterial disease strangles.

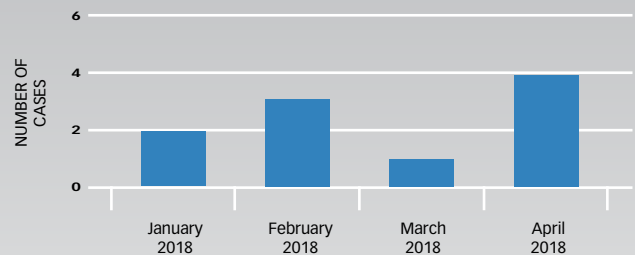
This contagious upper respiratory disease causes inflamed lymph nodes in the upper airway and trachea. Clinical signs include nasal discharge from the abscessed lymph nodes draining externally or into the guttural pouches (blind-end sacs connected to the throat in horses).

Individuals with questions or concerns about disease outbreaks can contact UK Veterinary Diagnostic Laboratory (VDL) at 859/257-8283. [UK](#)

>Jacqueline Smith, PhD, MSc, BSc, Dipl. AVES, UKVDL epidemiologist and adjunct professor of epidemiology at Lincoln Memorial University, is the founder of the UKVDL Disease Mapping Initiative, a database designed to record all infectious disease cases submitted to the UKVDL.



### MONTHLY TRENDS



See each month's featured map at [vdl.uky.edu/FeaturedMap](http://vdl.uky.edu/FeaturedMap)

## All About Alfalfa

Even after you've selected good hay, it pays to check it for dust, mold, weeds, foreign objects, blister beetles, and dead animals as you feed it.

Poisonous weeds that sometimes grow in alfalfa fields include ragwort, groundsels, Johnson grass, Sudangrass, water hemlock, and hoary alyssum.

To steer clear of these, buy hay from a reputable person or company that knows how to grow alfalfa weed-free.

### Take-Home Message

When incorporating alfalfa into a horse's diet, plan for the animal's specific nutritional needs. Your veterinarian and nutritionist can help you put together a balanced ration and recommend for or against feeding this forage.

"A lot of horse owners are intimidated by alfalfa and think they shouldn't feed it, but it is a great feed for horses," says Martinson. "Owners just need to manage the diet carefully ... and make transitions to and from alfalfa slowly." **UK**

>Heather Smith Thomas is a freelance writer for *The Horse: Your Guide To Equine Health Care*.

## Adam Named UK Equine Outreach Veterinarian

Emma Adam, BVetMed, PhD, MRCVS, Dipl. ACVIM, ACVS, has been named the equine outreach veterinarian for the UK Department of Veterinary Science. She will begin July 1.

"I am very pleased to welcome Dr. Emma Adam to our program in this very important role," said David Horohov, PhD, department chair and Gluck Equine Research Center director. "The purpose of this position is to enhance the overall outreach efforts of this department in terms of our teaching, service, and research activities. Dr. Adam is uniquely qualified for this position given her exceptional expertise in equine surgery and medicine as well as her research background."

The position was created to provide a better link between the research and diagnostic laboratories and those UK serves, said Nancy Cox, MS, PhD, dean of the College of Agriculture, Food and Environment.

"We expect a lot from this new position, and we have the perfect person in place to accomplish a new era of service to the veterinary and horseman community," she said. "We could not be more fortunate to have such a person as Dr. Emma Adam taking on this transformative position."

A native of Newmarket, England, Adam grew up on a commercial breeding farm and later worked for 10-time champion Thoroughbred trainer Sir Michael Stoute. Adam has experience with many equine disciplines. She has worked with breeding, racing, and athletic stock around the globe in Newmarket, England; Normandy, France;



COURTESY/MILT TOBY/UNIVERSITY OF KENTUCKY

Melbourne, Australia; and several locations in the United States.

"I'm very excited about the scope and possibilities of this position," Adam said. "This position is about forging links between the equine industry and the university so everyone can leverage our combined resources and share knowledge. As a clinician with first-hand experience of the demands of our profession and industry, I plan to be accessible and engaged in serving the industry and veterinary professionals."

Adam earned her doctoral degree in UK's Department of Veterinary Science. James MacLeod, VMD, PhD, oversaw her research at the Gluck Center, in which she examined articular cartilage and asked fundamental questions about what gene expression patterns make

articular cartilage so unique. She also compared the pattern with cells currently used in regenerative medicine. She earned her bachelor of veterinary medicine degree from Royal Veterinary College and her bachelor of science from King's College, both in the U.K.

She completed an internship at Colorado State University's College of Veterinary Medicine & Biomedical Sciences, in Fort Collins, followed by an internal medicine residency at Texas A&M University's College of Veterinary Medicine & Biomedical Sciences, in College Station, and a surgery residency at University of Pennsylvania School of Veterinary Medicine's (Penn Vet) New Bolton Center, in Kennett Square. There she helped care for 2006 Kentucky Derby winner Barbaro and was involved with many of his surgeries to repair a shattered leg sustained in that year's Preakness Stakes.

Adam is a member of the Royal College of Veterinary Surgeons, American College of Veterinary Internal Medicine, American College of Veterinary Surgeons, American Association of Equine Practitioners, and American Veterinary Medical Association. **UK**

>Jenny Evans, PhD candidate, MFA, is the senior veterinary science marketing/promotion specialist at the UK Gluck Equine Research Center.

## UK Gluck Foundation Seeks Equine Research Hall of Fame Nominations

The UK Gluck Equine Research Foundation is calling for nominations for the Equine Research Hall of Fame, which recognizes individuals who have had distinguished careers in equine research.

The Hall of Fame is located at the UK Gluck Equine Research Center, in Lexington. It was established to honor those who dedicated their careers to expanding the body of knowledge in equine science through their contributions to basic or applied research. The Hall of Fame is a lasting tribute to those internationally renowned for

## Gluck Foundation Hall of Fame Nominations

their endeavors as equine researchers.

All nominations will be submitted to an international review committee comprised of current Equine Research Hall of Fame members, who will recommend to the Foundation's Hall of Fame Committee nominees whom they consider qualified for this unique distinction. The UK Gluck Equine Research Foundation will announce those selected for induction.

Those eligible for consideration must have contributed very significantly to the field of equine research over an extended period. Nominees can be active researchers, retired, or deceased (posthumous award).

Nomination forms are available by contacting Jenny Evans at [jenny.evans@uky.edu](mailto:jenny.evans@uky.edu). Nominations must be submitted to Evans by e-mail no later than June 11. **UK**

>Jenny Evans, PhD candidate, MFA, is the senior veterinary science marketing/promotion specialist at the UK Gluck Equine Research Center.

### Equine Research Hall of Fame Members

- 1990 – W. R. "Twink" Allen, BVSc, PhD, ScD, DESM, MRCVS – England
- 1990 – John T. Bryans, MS, PhD – United States
- 1990 – William Wallace Dimock, DVM – United States
- 1990 – Elvis Roger Doll, MS, DVM – United States
- 1990 – J. Harold Drudge, DVM – United States
- 1990 – O. J. Ginther, VMD, MS, PhD – United States
- 1990 – Harold Hintz, MS, PhD – United States
- 1990 – Frederick Hobday, MRCVS – England
- 1990 – Robert M. Kenney, DVM, PhD – United States
- 1990 – Peter D. Rossdale, OBE, MA, PhD, DESM, FACVSc, FRCVS – England
- 1990 – Clyde Stormont, PhD – United States
- 1990 – Sir Arnold Theiler, DVM – South Africa
- 1991 – Philip R. Edwards, PhD – United States
- 1991 – Leo B. Jeffcott, BVetMed, PhD, FRCVS, DVSc – England/Australia
- 1992 – Harold E. Garner, DVM, MS, PhD – United States
- 1995 – Baltus Erasmus, BVSc – South Africa
- 2005 – Travis C. McGuire, DVM, PhD – United States
- 2005 – C. Wayne McIlwraith, BVSc, FRCVS, PhD, Dipl. ACVS, ECVS – New Zealand
- 2007 – Edward L. Squires, MS, PhD, Hon. Dipl. ACT – United States
- 2009 – Doug Antczak, VMD, PhD – United States
- 2009 – I.G. "Joe" Mayhew, BVSc, FRCVS, PhD, Dipl. ACVIM, ECVN – New Zealand
- 2009 – Alan Nixon, BVSc, MS, Dipl. ACVS – United States
- 2009 – Peter J. Timoney, FRCVS, PhD – United States
- 2012 – Eugene T. Lyons, PhD – United States
- 2012 – George P. Allen, PhD – United States
- 2012 – Stephanie J. Valberg, DVM, PhD, Dipl. ACVIM, ACVSMR – United States
- 2014 – Michelle LeBlanc, DVM, Dipl. ACT – United States
- 2014 – Ernie Bailey, PhD – United States
- 2014 – Elwyn Firth, BVSc, MS, PhD, Dipl. ACVS – New Zealand
- 2016 – Norm Ducharme, DMV, MSc, Dipl. ACVS – United States
- 2016 – Sue Dyson, MA, Vet MB, PhD, DEO, FRCVS – United Kingdom
- 2016 – Susan Stover, DVM, PhD, Dipl. ACVS – United States

## New Strangles Prevention and Treatment Guidelines Issued

Just as strep throat can run rampant in elementary schools, strangles, the "strep throat" of horses, caused by a different *Streptococcus* bacterium (*Streptococcus equi* spp *equi*), is highly contagious. Lymph nodes in the head and neck region become swollen and develop abscesses, resulting in nasal discharge and drainage from the throat. Though rarely fatal, strangles cases can range from mild to severe, and complications that impair eating and breathing can arise in some instances. Altogether, it's a disease that horse owners want to keep far from their stables.



ERICA LARSON/THE HORSE

The new guidelines explore the pros and cons of strangles vaccines and how to determine when it is safe to give vaccines.

Veterinarians have an important role to play not only in treating the disease but also ensuring that infected horses are kept away from other animals until they have fully recovered. This recovery is not always clear-cut, as many animals remain carriers of the bacteria even after they appear healthy.

To help veterinarians and owners alike understand the most up-to-date clinical recommendations, Ashley Boyle, DVM, Dipl. ACVIM, an associate professor of medicine at Penn Vet, took the lead in writing a new consensus statement, issued by the American College of Veterinary Internal Medicine, on treating, controlling, and preventing strangles. John Timoney, MVB, DSc, PhD, professor emeritus at

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ik-spōzd

*adj.* not shielded or protected



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## Strangles Guidelines

the UK Gluck Equine Research Center coauthored the report along with Richard Newton, BVSc, MSc, PhD, FRCVS, and Andrew Waller, BSc, PhD, of Animal Health Trust, in Newmarket, U.K.; Melissa T. Hines, DVM, PhD, Dipl. ACVIM, of the University of Tennessee; and Ben Buchanan, DVM, Dipl. ACVIM, ACVECC, of Brazos Valley Equine Hospital, in Texas.

“From a practical standpoint, the consensus statement serves to advise all veterinarians on what we recommend as a way to treat and deal with the disease,” Boyle says. “I’m an internist who sees this disease as a primary care doctor at farms as well as a field researcher. The authors of the consensus statement are a collection of experts ... including veterinary microbiologists, epidemiologists, and veterinarians who research this disease, as well as internists who encounter the disease frequently.”

The last consensus statement was issued in 2005; the lead author of that report was Corinne Sweeney, DVM, Dipl. ACVIM, professor of medicine and associate dean at Penn Vet’s New Bolton Center. Starting around 2012, Boyle began hearing from colleagues that it was time for an update, and Sweeney suggested she take on the project.

Boyle and coauthors reviewed information on strangles prevention, treatment, and control and identified where updates were necessary.

One of the key areas where guidance has shifted is how to determine when an animal is disease-free. This is a critical component of strangles control, as 10 to 40% of infected horses can remain carriers.

The previous consensus statement indicated a throat wash should be tested three times to be sure the horse was disease-free, “but it was hard to get owners and clients to do that three times,” Boyle says. “And multiple studies have shown that those three may not even be good enough.”

In the new statement, the authors instead recommend guttural pouch sampling, a technique that tests the fluid that sits in an area between a horse’s ear and throat, along with using an endoscope to visually assess the area for unruptured abscesses.

“We’re trying to encourage more primary care veterinarians to do this, even

though it’s time-consuming, because this is how the disease perpetuates itself,” says Boyle. “In the end it is easier, faster, and more effective than doing the three throat washes.”

**“There are huge financial repercussions not only from dealing with strangles but also from quarantining barns and screening potential carriers.”**

DR. ASHLEY BOYLE

Another change is a shift away from considering bacterial culture to be the gold standard of diagnosis.

“We no longer consider this the gold standard,” Boyle says, as horses with low bacteria levels can still be carriers but not have positive results. The authors see DNA amplification technologies such as polymerase chain reaction (PCR), along with visualization of the guttural pouch, as replacing culture as this standard.

“There is also a lot of work being done by my colleagues in Europe looking at genomic sequencing,” she says. “At some point in the future we may be able to use this technology to trace from where an outbreak came.”

The statement lays out best practices for quarantine and examination to prevent disease spread, along with biosecurity protocols to reduce transmission in facilities where infected horses have been housed. It spells out treatment



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## Strangles Guidelines

protocols, urging judicious antibiotic use, and explains how to recognize and treat one of strangles' most serious complications: a potentially fatal autoimmune reaction known as purpura hemorrhagica. It also explores the pros and cons of vaccines, the use of different blood tests to measure previous disease exposure, and how to determine when it is safe to vaccinate.

While the consensus statement is aimed at veterinarians, Boyle says owners often read them and can implement some of the recommendations. For example, horses are not thought to be contagious until 24 to 48 hours after fever onset.

"An owner can start thinking about

The consensus statement was published in the *Journal of Veterinary Internal Medicine*: A.G. Boyle et al: Streptococcus equi Infections in Horses: Guidelines for Treatment, Control, and Prevention of Strangles-Revised Consensus Statement. *Journal of Veterinary Internal Medicine* 2018; Feb 9. doi: 10.1111/jvim.15043.

View the statement in full at [onlinelibrary.wiley.com/doi/full/10.1111/jvim.15043](http://onlinelibrary.wiley.com/doi/full/10.1111/jvim.15043).

monitoring their horses' temperatures if they suspect an outbreak, and isolate horses when they first spike a fever," Boyle says. "That way they can catch it right at the beginning and spare any other horses from getting sick."

Even though strangles is not typically deadly, it is a global problem and quite costly, as management protocols can be time-consuming and extensive.

"There are huge financial repercussions not only from dealing with the disease but also from quarantining barns and screening potential carriers," Boyle

says. "It's also a big problem in the population of rescued horses, as they often come from different locations and are housed in close quarters resulting in the spread of disease."

Boyle says she and her colleagues hope that the new guidelines will help veterinarians and owners navigate strangles cases more effectively, ideally mitigating the disease's health and financial costs. **UK**

>Edited press release by Katherine Unger Baillie, University of Pennsylvania.

## Mok Wins UK's Veterinary Science Three-Minute Thesis Competition

ChanHee Mok, MS, a PhD candidate, won the 3rd annual UK Department of Veterinary Science's Three-Minute Thesis (3-MT) competition for PhD candidates (i.e., post-qualifying examination) on April 12 at the Gluck Equine Research Center.

Mok used Robert Frost's famous poem *The Road Not Taken* as an analogy to explain the developmental fate of cells that synthesize joint cartilage. Mok's advisor is James MacLeod, VMD, PhD, John S. and Elizabeth A. Knight Chair and professor at the Gluck Center. Mok earned a master's in equine nutrition from UK and a bachelor's in animal nutrition from Konkuk University in South Korea. She hopes to finish her doctoral degree in 2020.

Jasmin Bagge, DVM, a dual degree PhD candidate, finished second, and Wangisa Dunuwille, MSc, BVSc, a PhD candidate, finished third. MacLeod is also Bagge's advisor. Udeni Balasuriya, PhD, is Dunuwille's advisor.

Other presenters, including research area and advisor, were:

- Jennifer Bellaw, BS, parasitology, Martin Nielsen, DVM, PhD, Dipl. EVPC, ACVM;
- Fernanda Cesar, DVM, MS, Dipl. ACVIM—immunology—David Horohov, PhD;
- John Eberth, MS—genetics and genomics—Ernie Bailey, PhD;
- Gloria Gellin, MPH, MS, BS—infectious diseases—Craig Carter, DVM, MS, PhD, Dipl. ACVPM;
- Jessica Kenealy, BS—parasitology—Nielsen;
- Annet Kyomuhangi, MSc, BS—infectious diseases—Balasuriya;
- Fatai Oladunni, DVM, MS—infectious diseases—Thomas Chambers, PhD; and
- Ashley Steuer, DVM, BS—parasitology—Nielsen.

The rules of the 3-MT, which were originally developed at a New Zealand university, allow students three minutes to discuss their research using only one presentation slide and no gimmicks (e.g., props, costumes, songs, etc.)

This year's judges included Danielle Jostes, equine philanthropy director at the University of Kentucky College of Agriculture, Food and Environment; Ashutosh Verma, Dipl. ACVM, PhD, MVSc, BVSc, associate professor at Lincoln Memorial University College of Veterinary Medicine, in Harrogate, Tennessee; and Stephen Reed, DVM, Dipl. ACVIM, internist and shareholder at Rood & Riddle Equine Hospital in Lexington, Kentucky. **UK**

>Jenny Evans, PhD candidate, MFA, is the senior veterinary science marketing and promotion specialist at the UK Gluck Equine Research Center.

## Scientists Study Bloodworm-Associated Colic

The bloodworm, *Strongylus vulgaris*, is small enough to fit into horses' arteries, but it can cause big—even life-threatening—problems for its equid hosts. Researchers have determined that the survival rates for horses with bloodworm-associated nonstrangling intestinal infarctions (NSII) are poor whether they're treated medically or surgically.

As bloodworms migrate through the horse's intestinal arteries, they cause damage that leads to clotting. Blockages can occur when the clots detach or large amounts of larvae build up in smaller arteries. The result is intestinal wall infarction and inflammation, a condition called thromboembolic colic.



COURTESY DR. TINA HOLBERG PHIL

Surgeons performed exploratory laparotomy on 21 horses, 11 of which were euthanized due to their presumed poor prognosis.

## Bloodworm-Associated Colic

"If left untreated the intestine will rupture and the horse will die from shock," said Tina Holberg Pihl, DVM, an associate professor at the University of Copenhagen, in Denmark. She worked with colleagues including Martin Nielsen, DVM, PhD, Dipl. EVPC, ACVM, Schlaikjer Professor of Equine Infectious Disease at UK's Gluck Equine Research Center.

In a recent study looking at treatments and outcomes for 30 horses with bloodworm-associated NSII, Pihl said most patients did not exhibit severe colic signs. As such, she said, the condition is difficult to diagnose because most horses aren't extremely painful.

"Be aware of horses with low-grade colic and fever," she said. "Often the horses had been mistaken for having an

airway infection and had been treated for that for several days."

She also noted that 70% of horses were admitted to the hospital for NSII treatment during the winter.

Nine horses received medical treatment, none of which survived. Surgeons performed exploratory laparotomy (abdominal surgery) on 21 horses, 11 of which were euthanized due to their presumed poor prognosis, the researchers said. Of the nine horses that underwent intestinal resection to repair bloodworm-caused damage, just three survived to discharge. In a bit of good news, the researchers said, the surviving horses returned to athletic function for at least two years following discharge.

"If horses are taken to surgery faster than in this study, survival can be increased," Pihl said.

While previous research identified the

greatest risk among young horses, she said, this study contradicts those findings.

"This can be explained by the fact that young horses less than 4 have the highest egg shedding and are most often treated with anthelmintics (dewormers) twice yearly," she said.

Timely diagnosis is the key to increasing survival rates. A new research collaboration between University of Copenhagen, University of Oslo, the Swedish Agricultural University, and Gluck Equine Research Center is underway to identify better diagnostic aids, she said.

The study, "Nonstrangulating intestinal infarctions associated with *Strongylus vulgaris*: Clinical presentation and treatment outcomes of 30 horses (2008-2016)," was published in the *Equine Veterinary Journal*. **UK**

>Katie Navarra is a freelance writer for TheHorse.com.

## Mineral of the Month: Iodine

The trace mineral iodine is regarded by some as one of the most critical dietary trace minerals. This is due to the important role it plays in the thyroid metabolism and in the synthesis of the thyroid hormones triiodothyronine and thyroxine. These hormones fulfill multiple functions ranging from cell regulation to tissue differentiation and growth. When the body's iodine status declines to the point that these hormone levels become insufficient, the thyroid gland becomes enlarged. This is commonly referred to as goiter.

Some of the earliest references to goiter come from the ancient civilizations of China, India, Greece, and Rome. In particular, a book of Chinese origin dating back to 2000 BC referenced the use of seaweed against goiter. Iodine was discovered in 1811 and, following its detection in seaweed, a Swiss physician made the

connection and started treating patients suffering from goiter with iodine solutions around 1820.

Globally, almost all countries have been affected by iodine deficiency disorders at some point. In part this relates to the fact that soil iodine concentrations generally tend to be low; this is often reflected in plant iodine concentrations. Therefore, iodine deficiencies tend to be more prevalent than toxicity in unsupplemented grazing animals. Adding iodized salt is an efficient way to increase iodine in both human and animal diets. Therefore, having a free-choice iodized salt block available to your horse provides him or her an avenue for iodine intake. If you live in an area known to be iodine-deficient (also referred to as goitrogenic areas), local feed manufacturers might include iodized salt in equine concentrates, or you can add a set amount of iodized salt to your horse's grain or concentrates. Additionally, some owners add a seaweed- or kelp-based supplement to their horses'



Horses in heavy work, along with mares in late gestation and lactating broodmares, require more iodine than the average horse at rest.

diets; as always, it's important to following the manufacturer's feeding guidelines for such products.

A horse does not require iodine in large quantities. A mature horse weighing 500 kilograms (1,100 pounds), at rest or performing light exercise, only requires 3.5 milligrams of iodine per day (National Research Council's *Nutrient Requirements of Horses*, 2007). This amount increases for mares in late

gestation, lactating broodmares, and horses in heavy work.

Should you have any concerns or questions regarding iodine intake, an equine nutritionist can help evaluate your horse's diet and vitamin and mineral status. **UK**

>Mieke Holder, PhD, is an assistant research professor within UK's Department of Animal and Food Sciences.

## UK Equine Farm and Facilities Expo to be Held May 31

The UK Ag Equine Programs will host its annual Farm and Facilities Expo on Thursday, May 31, 3:30 - 8 p.m., at Knapper Farm, 485 Chatham Ln., in Harrodsburg.

Attendees will have the opportunity explore booths and see displays featuring all aspects of horse farm management. Speakers will present on cost sharing, weed control, rotational grazing, ryegrass, and maintaining healthy horses.

"This event helps people to work with stakeholders and put new research into action," said UK Ag Equine Programs Director Mick Peterson, PhD.

Krista Lea, MS, research analyst and UK Horse Pasture Evaluation Program coordinator, added, "The Equine Farm and Facilities Expo targets small and mid-sized operations with the aim of improving pasture and facility management. We try to provide relevant information and practices that can be implemented on any farm.

"This year's focus will be on cost-share opportunities, many of which are only recently available to horse operations," she continued. "These programs aim to improve the economic sustainability of the operation while protecting its natural resources. The Knappers are a great example of a small farm utilizing these funds to improve their business while protecting the land."

The event is free and open to the public. A meal will be provided for attendees. While not required, an RSVP to [equine@uky.edu](mailto:equine@uky.edu) is appreciated for food planning purposes. **UK**

>Hailee Adams, a communications and student relations intern with UK Ag Equine Programs, is a junior double majoring in equine science and management and hospitality management and tourism.

**Join Us for the  
UK Equine Farm & Facilities Expo**

**Thursday, May 31st, 3:30-8:00 p.m.**

**Knapper Farm  
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*Free meal will be provided!*

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Program

3:30 - Registration

4:00 - Exhibitor Booths

5:00 - Welcome, Dinner provided by the Mercer County Cattlemen's Association

5:30 - **Keynote Speaker: Utilizing Cost Share to Improve Grazing, Profitability and Resource Protection on Horse Farms, Adam Jones, NRCS State Grazing Specialist**

6:00-8:00 Educational Sessions, concurrently every half hour:

- **Weed Control Following a Wet Spring, Dr. Bill Witt and Keenan Bishop**
- **Implementing Rotational Grazing on Horse Farms, Steve Musen and Dr. Bob Coleman**
- **Ryegrass to the Rescue! Quick Fixes for Mud, Toxic Tall Fescue and Overgrazing, Dr. Ray Smith**
- **Maintaining a Healthy Horse, Dr. Justin Murray**

*Paul and Melita Knapper run a small Thoroughbred breeding and layup operation just south of Shaker Village of Pleasant Hill. They are also the first of three established demonstrations farms showcasing federal cost share opportunities on equine operations in Kentucky.*

**RSVP requested to [equine@uky.edu](mailto:equine@uky.edu) or 859-257-2226**



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## UK Horse Pasture Evaluation Program 2018 Enrollment Open

The UK Horse Pasture Evaluation Program is entering its 14th sampling year and continues to assist farms across the state improve their pasture management regimens.

Participating farms receive detailed pasture assessments, including grass species composition and tall fescue analysis. The program also provides recommendations for maintaining and improving each pasture based on the data collected. All of the findings are compiled in a notebook and



Participating farms receive detailed pasture assessments, including species composition and tall fescue analysis.

presented to participants by a program specialist.

This work aims to improve farm owners' understanding of pasture

and grazing management, reduce the need for stored feeds and reduce horses' impact on our natural resources.

The program also has an educational component. Undergraduates working in the program learn plant identification and research principles while gaining valuable experience and exposure to agriculture.

Since its start in 2005, this program has completed more than 200 evaluations representing more than 17,000 acres in 23 different Kentucky counties. Evaluations are open for Kentucky horse farms of all sizes. For more information on the program, pricing, or to enroll, visit [forages.ca.uky.edu/pasture\\_eval](http://forages.ca.uky.edu/pasture_eval). **UK**

>Krista Lea, MS, is a research analyst and coordinator of the UK Horse Pasture Evaluation Program.

## UK College of Agriculture, Food and Environment Faculty Spotlight Videos: #ItStartsWithUs

### UK VDL's Uneeda Bryant and Jennifer Janes



**Uneeda Bryant, DVM**  
[youtube.com/watch?v=aB5rVP468QA](https://youtube.com/watch?v=aB5rVP468QA)

Uneeda Bryant, DVM, assistant professor at the UKVDL, shares why she's passionate about combining her love for veterinary science and teaching young children about careers in STEM (science, technology, engineering, and math).



**Jennifer Janes, DVM, PhD, Dipl. ACVP**  
[youtube.com/watch?v=aHAAJMMRB8I](https://youtube.com/watch?v=aHAAJMMRB8I)

Jennifer Janes, DVM, PhD, Dipl. ACVP, assistant professor at the UKVDL, describes how vital each job is within the lab, not only when it comes to the animals they work directly with but also to address Kentucky's needs as a whole.

## Upcoming Events

### May 4 and 6

UK Graduation  
Rupp Arena, Lexington

### May 4

Equine Science and Management Graduation Reception  
E.S. Good Barn, Lexington, Kentucky

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