The ability to be able to forage is considered a basic need in equine nutrition

The Quest for Nutritional Excellence

FINDING **A FEEDING PLAN** THAT MEETS YOUR EQUINE'S NEEDS

By **AMANDA DUCKWORTH**

THE OLD JOKE goes that hay is for horses, but when it comes down to it, proper equine nutrition is no laughing matter. Getting it wrong can have far-reaching physical and behavioral consequences. Like many topics when it comes to equine athletes, though, while the need to feed a horse is obvious, what and how to feed a horse is rarely straightforward.

No one-size-fits-all feeding plan exists. Further complicating matters is the reality that working horses may not be stabled in a situation that is anywhere close to what they would experience in nature. In turn, that can impact both their physical and mental well-being, even if they are being fed nutritious food.

While the specific nutritional needs for horses vary widely based on what phase of life they are in, there is one area where research is clear. Horses need to be able to forage. As a starting place for anyone interested in learning more about the basics of equine nutrition, the American Association of Equine Practitioners (AAEP) provides an in-depth look in its paper "Nutrition: The Key to Unlocking Your Horse's Health" by Dr. Lydia Gray.

"The most basic requirement in a horse's diet is long-stem forage," explained Gray. "Ideally, this comes in the form of fresh grass. If grass is not available, free-choice grass hay is the next best choice. Keeping hay in front of horses at all times allows them to most closely mimic their natural grazing behavior. When this feeding arrangement is not practical, horses should receive at least 1% of their body weight each day in forage, divided into as many meals as possible."

For those equines with more turnout time, there are multiple ways to approach the way forage is provided, but these decisions can also impact the horses in various ways. In November 2023, the Journal of Equine Veterinary Science published "Effects of Different Hay Feeders, Availability of Roughage on Abnormal Behaviors and Cortisol Circadian Rhythm in Horses Kept in Dry Lots."

"Free-ranging horses can spend around 16 hours per day grazing and offering restricted access to food can change the natural behavior of this species, causing disorders that may be detrimental to the health of the animal," explained researchers. "Stereotypies are invariant and repetitive behavior patterns that seemingly have no function and other abnormal behaviors are practices that do not fit this definition but are not commonly observed in horses living in wild environments. Researchers theorize that the prevalence of those behaviors can be attributed to the inability to express highly motivated behaviors, such as foraging activity."

For the study, researchers compared the effects of feeding free choice hay, automatic box feeders, and slow feeders. It was designed as a 3 x 3 Latin square design, and the horse population was made up of 15 healthy Thoroughbred cross horses, featuring two geldings and

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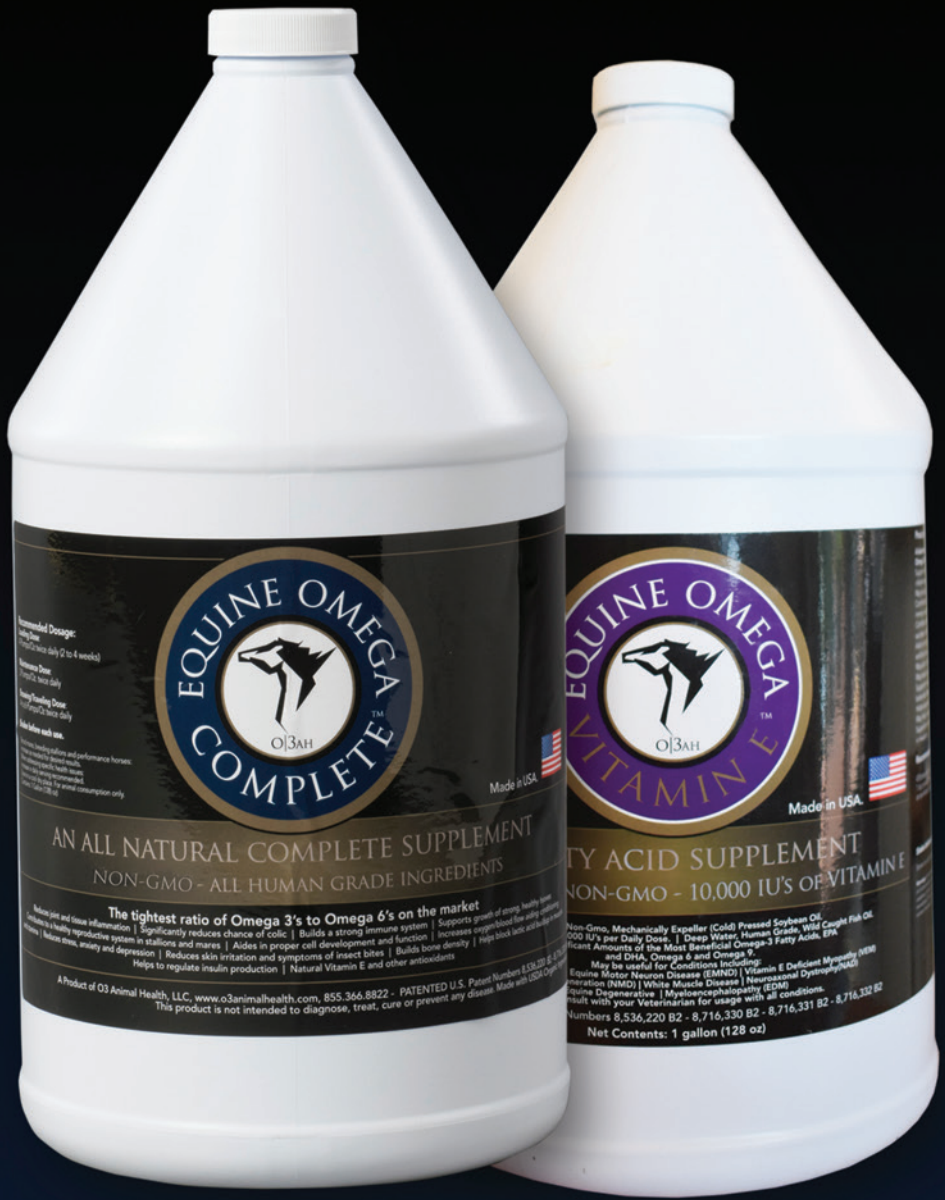

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Optimally, foraging comes from fresh grass with free-choice grass hay the next best choice

COURTESY OF AIRDRIE STUD

13 mares, that belonged to the Polo Club at Colorado State University.

The horses in the study completed 15 days in each scenario. Every 15 days, body weight was measured, blood samples were collected, and behavior recorded during the last 24 hours of the last day was analyzed.

"Horses in the box and slow feeder groups had a lower hay utilization rate and lower weight gain in the current study and both treatments can be considered equivalent in food efficiency and intake control," researchers concluded. "Horses in the free choice treatment had the highest rates of hay utilization and weight gain, and this regimen should not be recommended to overweight horses.

"Free choice and slow feeder horses spent more than 50% of the time-budget foraging, generating a time-budget similar to grazing horses. Box feeder horses spent less time eating, increasing time spent standing, sniffing the ground, and practicing coprophagy (the eating of feces). Box feeder horses showed the highest aggression. Cortisol circadian rhythm was not different among treatments."

The fact the horses who spent less time eating showed the highest amount of aggression echoes previous studies. In November 2021, the Journal of Equine Veterinary Science published "Factors Associated With the Development and Prevalence of Abnormal Behaviors in Horses: Systematic Review

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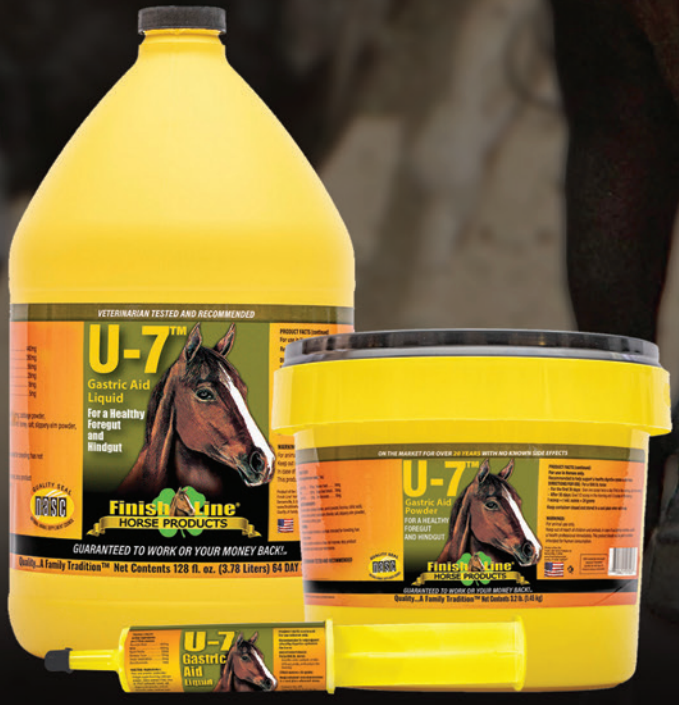

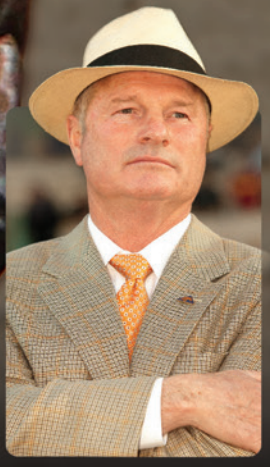

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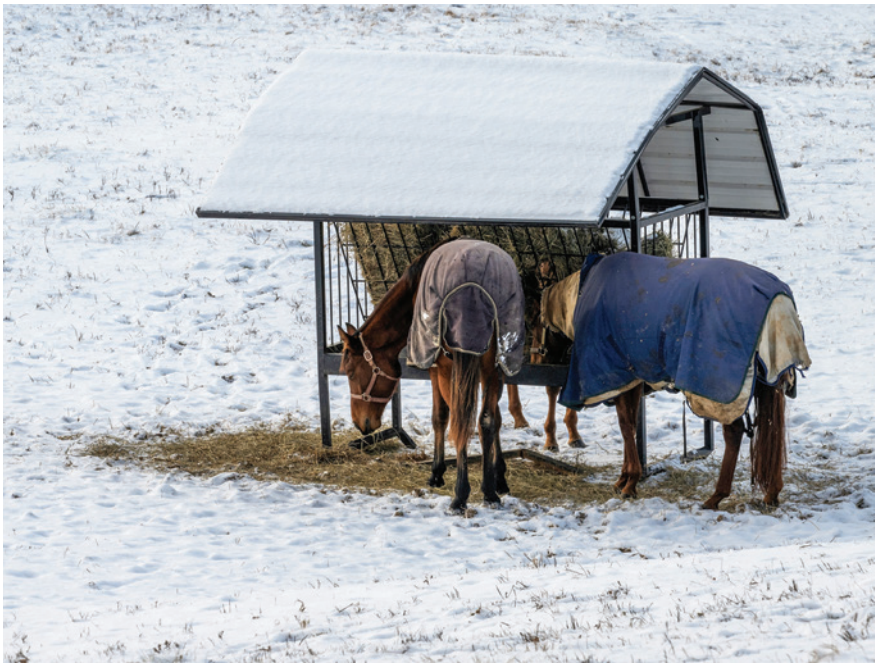

Studies have shown that automatic box and slow feeders result in lower weight gain compared to free-choice hay

With Meta-Analysis."

"The development and prevalence of abnormal behaviors in horses may be caused by several environmental and biological factors, and the literature offers numerous reports that discuss the causes and effects of stereotypies in these animals," explained researchers. "In this light, this study aimed to conduct a systematic review and meta-analysis of the scientific literature, summarizing the main risk factors associated with the development of abnormal behaviors in horses.

"Abnormal behaviors and stereotypies are commonly recognized as indicators of poor welfare and may directly impair athletic performance, resulting in great economic loss to horse owners."

Research for the study was conducted over four years and encompassed a total of 19 texts in either Portuguese, Spanish, or English that were carried out in eight different countries. Publications eligible for review were full text research thesis or articles that included presentation of epidemiological information on the studied population; prevalence of abnormal behaviors in equine populations; and factors associated with the development or prevalence of stereotypies.

"The results showed a great variation in the mean prevalence of abnormal behaviors, with no significant difference between research conducted through questionnaires or direct observation, and the data mining technique identified that incorrect nutritional management may be the main factor influencing the development and prevalence of abnormal behaviors in horses," researchers concluded. "Management practices used in the horse sector have changed very little over the last quarter of century, and the development of strategies is extremely necessary to prevent abnormal behaviors and improve stabled horses' welfare."

Although essential nutrients are found in the feed tub, foraging is considered the gold standard in a horse's diet

Horses who are in active work tend to have very specific nutrition plans, but it can be hard to recreate a natural foraging environment. In December 2023, the Journal of Equine Veterinary Science published "Time-Budget and Welfare Indicators of Stabled Horses in Three Different Stall Architectures: A Cross-Sectional Study."

"Under natural conditions, horses spend 67% to 75% of their time grazing, 15%–25% resting or sleeping, and 6%–10% observing the surroundings, with other activities occupying the remaining time," explained researchers. "Further studies revealed that domestic horses will display time-budgets similar to those of feral horses when given the opportunity. Therefore, domesticated horses are often compared to feral individuals from the same species. With that in mind, differences in the time-budgets of domesticated horses compared to feral conspecifics are currently used to reveal welfare impairment."

During this study, three types of stalls were analyzed: B1, which was 3.2 × 3.7 m with tactile contact between horses; B2, which was 2.6 × 3.5 m with visual contact between horses and outside view; and B3, which was 2.3 × 3.4 m with visual contact and outside view.

"Keeping horses in single stalls can lead to the development of abnormal and stereotypic behaviors," explained researchers. "Opportunities for social interactions and stall architecture can influence behavior. The current study aimed

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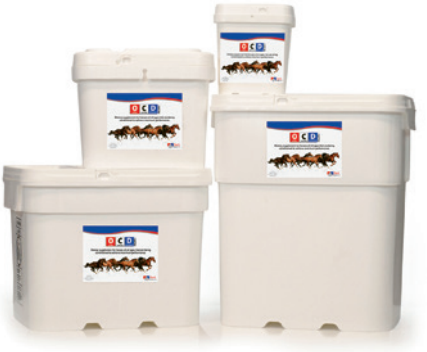

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to identify how three different stall architectures influenced time-budget and physiological parameters in horses.

"In the equine industry, high-performance sport horses are commonly housed in single stalls. However, this kind of management technique can prevent horses from performing natural behaviors due to restricted feeding and movement, and social isolation, which may lead to a chronic stress state. This condition can cause behavioral, physical, and metabolic disorders that are detrimental to the health of the animal."

For the study, 29 horses were randomly selected, with 10 horses each in B1 and B3 stalls and nine horses in B2. A total of 696 hours of video recordings were analyzed with continuous behavioral sampling, generating a total of 41,760 observations. Researchers determined that all of the horses in the study presented at least one abnormal and stereotypic behavior, regardless of stall design, and that the stabled horses fed hay and concentrate spent only 14% of their time eating.

"All horses observed in this study presented abnormal and stereotypic behaviors," researchers concluded. "The diet had a direct impact on the horses' time-budget, creating long periods of idleness and fasting. The forage content below ideal values may have led horses to develop abnormal behaviors (bedding-eating, coprophagy, and wood chewing) and to spend more time with those practices than eating proper food."

Beyond behavioral issues, studies have also shown that horses who are continuously fed hay have less acidity in their stomachs compared to horses who are fasted. This is extremely important because another common problem in horses—no matter the age or discipline—is equine gastric ulcer syndrome (EGUS). The two main disease entities that fall under this umbrella are equine squamous gastric disease (ESGD) and equine glandular gastric disease (EGGD). Thoroughbreds, especially those in active training, are known to struggle with these issues, which can create a domino effect in terms of health. In April 2023 Animals (Basel) published the review "The Fiber Requirements of Horses and the Consequences and Causes of Failure to Meet Them."

Studies indicate that alfalfa has a "strong intrinsic acid buffering capacity"

"Failure to meet the minimum forage requirement of 1.5% of the horse's bodyweight and the opportunity for foraging for a minimum of eight hours a day (not going without this opportunity longer than four to five consecutive hours) can have both physiological and behavioral consequences," explained researchers. "To provide an energy source for horses, rations often include starch rather than fiber. This can result in health issues related to the gastrointestinal tract (GIT) in the horse. In the stomach, the main concern is equine gastric ulcer syndrome (EGUS) and, more specifically, equine squamous gastric disease (ESGD)."

Studies have shown that ulcers are caused by increased acidity in the stomach or from the splashing of acidic juices caused by a lack of a forage barrier prior to exercise or prolonged periods without fibrous feed intake.

"After water, fiber is the most important component of a horse's diet," explained researchers. "Replacing starch in a high-energy diet with a fibrous alternative greatly reduces the risk of gastrointestinal disease and improves digestion, body condition, behavior, immune function, athletic performance, and adaptation to weaning. In many cases, failing to feed the horse its fiber requirement reflects a lack of knowledge on the part of the owner."

If a horse is dealing with ESGD, it is important to work with someone who specializes in equine nutrition to help improve the situation. In February 2024, the Journal of Equine Veterinary Science published "The effect of feeding a commercial feedstuff on gastric squamous gastric disease (ESGD) healing and prevention of recurrence."

"Feedstuffs are often recommended to mitigate potential damage from acid associated with equine squamous gastric disease (ESGD)," explained researchers. "In acidic conditions, pectin alters its structure to one like mucus and binds the stomach mucosa, whilst alfalfa has a strong intrinsic acid buffering capacity. The study aimed to determine whether feeding a commercial beet pulp/alfalfa/oat fiber mix aids ESGD healing and/or prevention of recurrence."

For the study, 10 adult horses with naturally occurring ESGD were treated with omeprazole, following the attending veterinarian's recommendation. Then,

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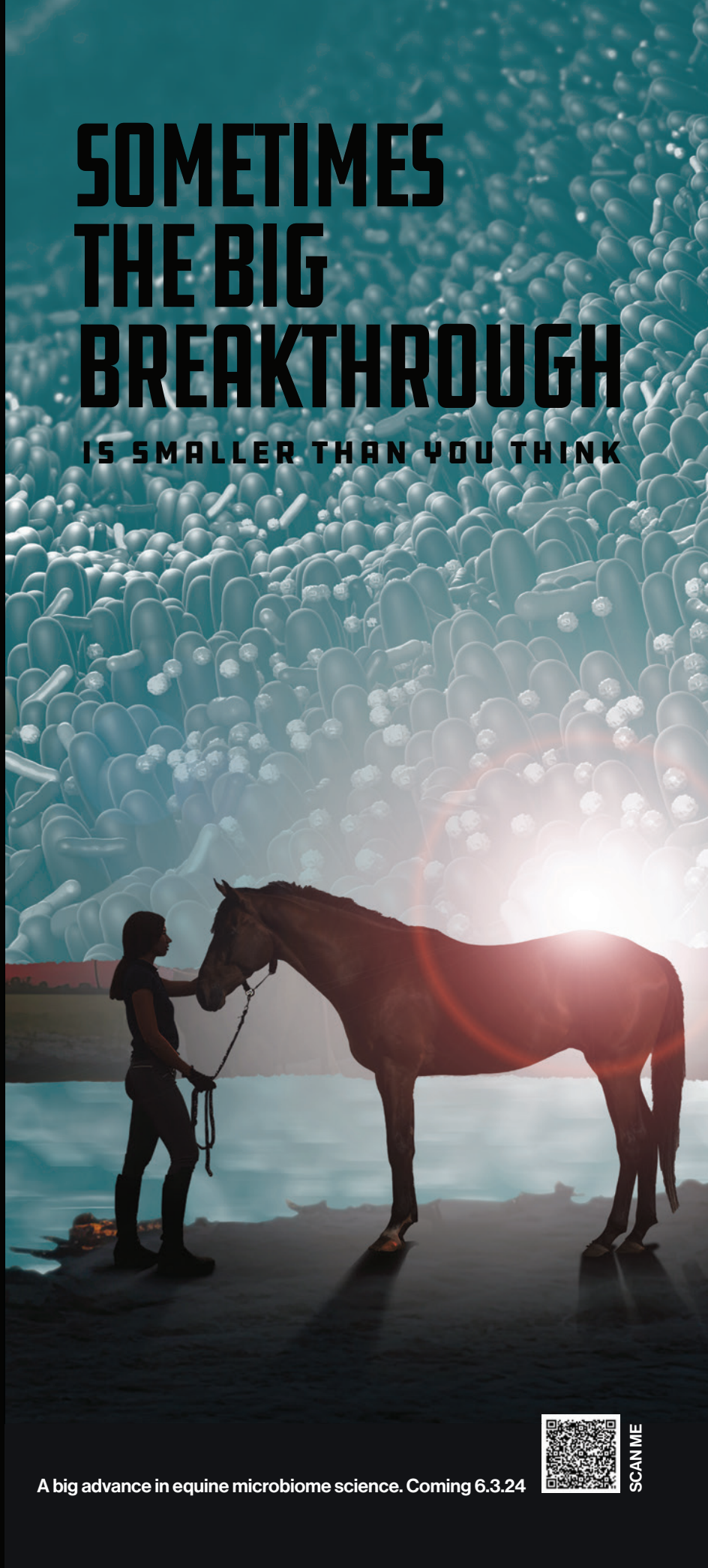

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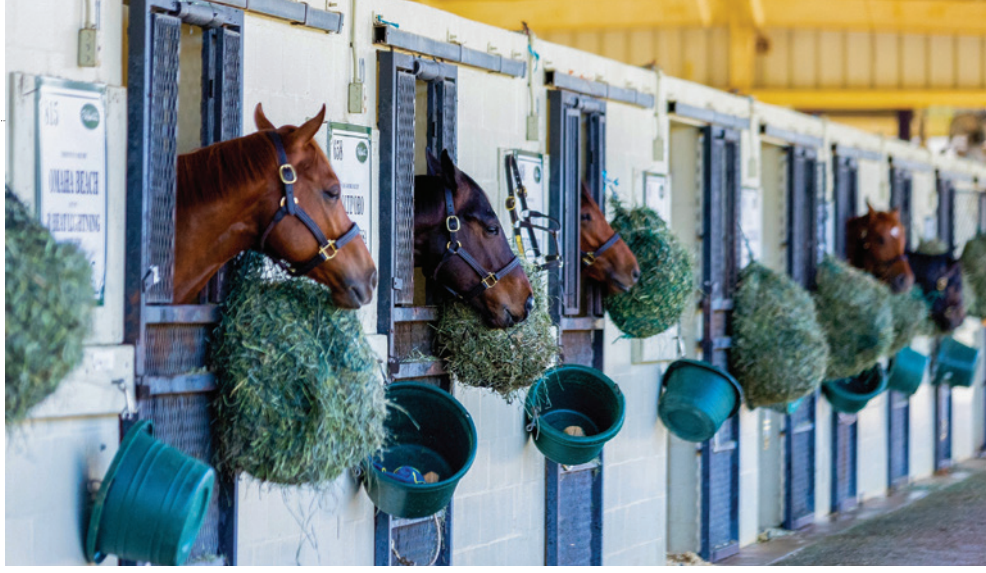

"Keeping hay in front of horses at all times allows them to most closely mimic their natural grazing behavior," Dr. Lydia Gray wrote in a paper for the American Association of Equine Practitioners

half of the horses were randomly assigned to also be fed a commercial beet pulp/alfalfa/oat fiber mix for one month, while the other five horses were not.

Following that month, the horses were checked via gastroscopy to assess their responses, and if the ESGD had healed, the omeprazole therapy was stopped while the commercial feed was given to all horses for a month. Then they were checked again.

"ESGD had healed in all animals after one month," concluded researchers. "ESGD recurred in significantly fewer animals fed a commercial beet pulp/alfalfa/oat fiber mix during the healing and prevention phases compared to those fed the diet in only the prevention phase in this small study involving animals with naturally occurring disease. Further studies are warranted to evaluate this potential beneficial effect in more detail."

In short, the nutrition plan for equine athletes goes far beyond simply a scoop of grain or a flake of hay. Studies have shown time and time again that most stable environments differ greatly from a natural environment, which in turn can cause health issues. Balancing the needs of practicality with nutritional excellence is a line all horse owners must walk, and continuing education on the topic is vital for all parties involved. BH