Nutrients found in hay are essential for horses who spend most of their time indoors

Why Hay Matters

A MAJOR PART OF **A HORSE'S DIET,** NOT ALL HAY IS CREATED EQUAL

By **AMANDA DUCKWORTH**

IT IS WELL known that horses are grazing animals. Scientifically speaking, they are non-ruminant herbivores, which means they are plant eaters with a single-chambered stomach.

At a bare minimum, forage should make up 50% of a horse's daily diet, but it is widely accepted that number should be closer to at least 75%. Because performance horses often are unable to graze in a natural way due to scheduling, hay is a common part of the diet. This is because the equine digestive system is designed to have constant forage, and hay is a valuable substitute when grass is unavailable.

For those looking to learn more about the basics of hay and horses, the American Association of Equine Practitioners has created a "Hay Quality and Nutrition" presentation, which is available on its website.

Some key takeaways are that the nutritive value and palatability of hay primarily depends on two factors: species and maturity. Legumes tend to be more palatable and nutrient dense compared to grass. The same goes for less mature forages when compared to more mature counterparts.

Additionally, it is important to remember that hay should always be physically evaluated for a number of things, including species, maturity, touch, smell, color, presence of toxic plants and weeds, presence of mold and dust, and presence of insects.

While the "why" horses get hay in addition to or in place of grass is a widely accepted facet of horse husbandry, the "when" and "how" aspects leave more room for debate and research.

In December 2025, the Journal of Equine Veterinary Science published "The use of hay nets and slow feeders as feeding methods in horse management: A semi-systematic review."

"Hay nets and slow feeders are designed to mimic natural grazing by prolonging forage intake, thereby supporting digestive health and reducing stress-related behaviors," explained researchers. "Their design and use, however, can influence effectiveness and may introduce risks. This semi-systematic review evaluated the use of hay nets and slow feeders in feeding horses, focusing on their impact on feeding time, behavior, forage management, and health management."

Researchers identified 26 studies to include in the review, all of which were published between 2009 and 2025. Some key conclusions included that horse feeding time was extended by 40% depending on mesh size, multi-layered nets, and forage type; and that slow feeders consistently reduced forage wastage from 57% to as low as 6%.

"Behavioral benefits included reductions in cribbing, and weaving, although overly restrictive designs sometimes provoked frustration, pawing, or net flinging," researchers concluded. "Ground-based slow feeders encouraged a natural head-down posture, whereas elevated nets increased neck tension and pulling force, raising concerns about musculoskeletal strain. Dental impacts appeared minimal, but

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When the weather isn't conducive to grazing, hay placed on the ground can be substituted for grass

long-term outcomes remain unclear. For weight and metabolic health, some studies reported net-fed horses losing 20-23 kg compared with weight gain in floor-fed controls, while others found no changes.

"Overall, hay nets and slow feeders provide clear welfare and management benefits, but design and application must balance efficiency with equine wellbeing. Further research should refine their use across breeds, management systems, and individual horse need."

In addition to needing the hay in the first place, horses need to digest it properly to receive maximum value. In August 2025, Animal published "Prediction of the digestibility and digestible energy content of hay for horses using an enzymatic degradability method."

"The nutritive value of forage for horses is closely dependent on the digestibility of organic matter (OMD), which is typically measured in vivo," explained researchers. "Researchers have developed a variety of prediction methods to estimate the digestibility value of hay. In ruminants, pepsin-cellulase degradability, expressed as dry matter enzymatic degradability (dCS) and organic matter enzymatic degradability (dCO), is a commonly employed method for predicting OMD in forage types.

"The objective of this study was to evaluate the feasibility of predicting the dry matter digestibility (DMD), OMD, energy digestibility (ED), and digestible energy

(DE) content of hay through enzymatic degradability or a combination of enzymatic methods with other chemical composition parameters."

Researchers created a database of 43 hays harvested in a temperate zone, which was made up of 32 natural grassland hays, five grass hays, and six lucerne hays. They constructed it from studies carried out at the French National Institute of Agricultural Research. Then, researchers analyzed the dCS and dCO of each hay type and their in vivo digestibility in horses.

They found that the range of OMD across the entire dataset was between 0.42 and 0.63, and the range of dCS cellulase digestibility was between 41.0% and 62%.

"The results demonstrated that there were no significant differences between the slopes of the models obtained for the various forage types," researchers concluded. "This study presents models for predicting the nutritive value and DE content of hay harvested in temperate zones using an inexpensive easy-to-implement, repeatable, and reproducible laboratory method on the basis of enzymatic degradability.

"The results of this study contribute to the existing body of knowledge on the prediction of the nutritive value of horse feed with satisfactory accuracy for practical use. Further research is needed to extend the range of models to other forage types, such as green and fermented forages, and to increase the number of hay samples, particularly for grasses and leguminous hay."

How the hay is served is also not always a straightforward matter. It is not uncommon to steam hay for horses that would benefit from the effort to do so.

The benefits of steaming hay versus serving it dry to asthmatic horses "showed inconsistent benefits in clinical studies."

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> —JOURNAL OF EQUINE VETERINARY SCIENCE, DECEMBER 2025

In September 2025, Equine Veterinary Journal published "Steamed hay for the prevention of severe equine asthma exacerbations."

"Steaming hay reduces respirable particles and is commonly used to feed horses with asthma," explained researchers. "However, it showed inconsistent benefits in clinical studies."

For the study, researchers fed horses steamed and dry hay for four weeks in a prospective, cross-over study, with a four-week washout period. It lasted from January to April 2023, and nine adult horses from the Equine Asthma Research Laboratory of the Université de Montréal were used.

All of the horses, which included Quarter Horses and Quarter Horse crosses, Paint Horses, one Thoroughbred, and one Canadian horse, completed the study. Researchers recorded lung function, bronchoalveolar lavage (BALF) cytology, and a 23-point weighted clinical score (WCS) before and after four weeks of hay feeding.

"Both dry hay (DH) and steamed hay (SH) led to a deterioration of pulmonary function and inflammation in horses with SEA in clinical remission, with no notable difference between DH and SH," researchers concluded. "However, lung function and inflammation worsening were relatively mild, and no significant deterioration of clinical scores was observed. For some parameters (R5 and R7), lung function was worse at the end of the second arm of the study.

"In this study, SH did not prevent the deterioration of lung function and inflammation over a 4-week period. However, the horses remained in a state of subclinical exacerbation, and a more pronounced exacerbation could have revealed differences between DH and SH."

There is more than just nutritional value to consider when feeding hay. Even if horses are not asthmatic, the dust associated with inferior hay can be problematic. It is one of the reasons the AAEP encourages visual inspection

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of hay. In September 2025, Animals (Basel) published "Sensory Assessment of Hay Samples: Abnormal Odor Predicts Increased Dust Levels and Impurities Suggest Microbiological Contamination."

"Hay is a major part of a horse's diet, but if it contains too much dust or is contaminated with harmful microorganisms like mold or bacteria, it can cause serious breathing problems," explained researchers. "Horse owners and caretakers often check hay quality using sight, touch and smell, but it is unclear whether this simple method can detect hay that might be harmful. This study aimed to explore the potential of sensory assessment to predict both particulate matter (PM) dust concentrations and microbiological contamination."

Hay feeders were viewed as an "enrichment item" in a study published in Animals (Basel) last year

One study reveals "elevated nets increased neck tension and pulling force, raising concerns about musculoskeletal strain."

For the study, researchers collected 50 hay samples. They examined them using both sensory evaluation and more specific methods to measure dust levels and check for potentially harmful microorganisms.

According to researchers, sensory examination rated only 28% of samples as adequate, with 52% showing minor and 20% major deficiencies, while microbiological analysis found that 46% of samples met acceptable standards.

"The study underscores the utility of sensory examination—particularly abnormal odor and visible impurities—as an effective initial screening tool for hay quality," concluded researchers. "Incorporating such simple and cost-effective assessments into routine stable management practices could significantly contribute to improved equine respiratory health outcomes by enabling timely interventions. The sensory analysis used was essential to identify hay samples unsuitable for horse consumption due to the high proportion of moldy and even spoiled material.

"The results showed that hay with an abnormal smell was more likely to produce high levels of dust, and hay with visible dirt or debris was more likely to contain potentially harmful bacteria or fungi. This research highlights the value of basic sensory assessments as a rapid and low-cost means to monitor hay hygiene and protect horses' respiratory health."

Although foraging is a natural behavior for horses, it is one that can often be limited for working horses. In November 2025, the Journal of Equine Veterinary Science published "Time-activity budget in horses and ponies: A systematic review and meta-analysis on feeding dynamics and management implications."

"The time-activity budget is a key indicator of animal welfare," explained researchers. "This meta-analysis integrated 14 studies (1979-2020) with 364 horses under wild, natural-living, and stabled conditions to evaluate feeding, resting, standing, and locomotion. The study aimed to categorize daily behavioral patterns in equines, with emphasis on feeding behavior."

Overall, researchers found that feeding was greater in free-ranging (56%) than stabled horses (38%); in grouped (54%) vs. isolated (39%); in females (64%) vs. males (48%); and in grazing (56%) vs. hay-fed horses (39%).

"Resting was higher in young, small, grouped, and grazing horses," concluded researchers "Standing was commoner in stabled, isolated, adult, larger, and hay-fed animals. Locomotion increased in free-ranging, grouped, and grazing horses. Management promoting foraging, social interaction, and locomotion enhances equine welfare."

That can be easier said than done when it comes to horses who need to be stabled, but there are ways to improve conditions. In September 2025 Animals (Basel) published "Physiological and Behavioral Responses of Stabled Horses (Equus caballus) to Three Types of Environmental Enrichment."

"Free-roaming horses travel around twenty miles per day and spend 50-60% of their time grazing, but domesticated horses often have limited time in turnout pastures and spend most of their day in stalls," explained researchers. "This increases time standing stationary and greatly reduces grazing time, which can negatively impact the horses' physical and mental health.

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"Enrichment can help improve welfare by allowing the opportunity to perform species-typical behaviors and engage in mental and physical stimulation; therefore, this study compared how different enrichment items (hay feeders, activity balls, and mirrors) affected horse behavior and physiology."

Researchers used nine Quarter Horses for the study. The horses were given hay feeders, activity balls, or mirrors across randomized trials, which included observation. The enrichment was removed between sessions. Smart halters recorded heart and respiration rates, and behaviors were video scored.

"Enrichment did not affect respiration rate but did increase heart rate, which indicates that horses were in a high-arousal state when provided enrichment," concluded researchers. "The hay feeder showed the strongest physiological effects among the items, and heart rate was not dependent on provision time, except for horses with the mirror, having a higher heart rate during daylight hours.

The equine digestive system is designed to have constant forage

"Overall, enrichment encouraged more species-typical time budgets in stabled horses. All items had positive behavioral effects compared with the control and could be used as effective enrichment, though there were enrichment-type effects for certain behaviors, so enrichment program strategies could be used to target and achieve specific management goals. However, the hay feeder appeared more effective at fulfilling overall behavioral needs."

The dietary needs of horses vary depending on lifestyle, and it is important to work with a veterinarian or nutritionist to lock in the best program for each individual horse. However, one thing is true for most horses: hay will almost certainly play a vital part in any nutritional plan. BH