

Is Alfalfa the Right Choice?

Alfalfa is a perennial, leguminous forage grown throughout much of North America. Plants have an exceptionally deep root system, so they are able to thrive in dry conditions that may thwart production of other hay crops.

As forage for horses, **alfalfa is both revered and disparaged**. Over the years, equine nutritionists have formulated rations that stray considerably from those fed in the “timothy-and-oats” days in an effort to deliver proper nutrient ratios. While it may not be the best hay choice for all horses in all management setups, **high-quality alfalfa possesses sufficient nutrients to support high production such as growth and lactation**.

Early-bloom alfalfa is **rich in energy** (2.4 Mcal digestible energy/kilogram dry matter), **protein** (17-20%), **calcium** (1-1.8%), and **vitamin A** (50-85 IU/kilogram dry matter x 1000). Mature, full-bloom alfalfa has less energy (2.1 Mcal digestible energy/kilogram dry matter), protein (15-18%), and vitamin A (10-30 IU/kilogram dry matter x 1000).

Growing horses— The value of alfalfa hay is readily apparent when formulating rations for growing weanlings and yearlings. **Feeding appropriate levels of high-quality alfalfa (amount fed is based on body weight) will meet requirements for protein, lysine (an essential amino acid for growth), calcium, and phosphorus**. The proper calcium to phosphorus ratio is more easily achieved when diets containing alfalfa are fed. This is not to say, however, that rations for growing horses must include alfalfa. Slow, steady growth can also be achieved with top-quality grass hay and a concentrate that complements the nutrient profile of the forage. And while alfalfa hay is rich in protein, the protein is **not digested and absorbed efficiently in the small intestine**, according to research conducted at Texas A&M University. A ration of 60% oats and 40% alfalfa, for instance, would satisfy 118 and 114% of protein and lysine requirements, respectively. Once small intestine digestion is factored in, the same diet would meet 104 and 95% of the protein and lysine requirements, respectively. This represents a 12 and 17% reduction in digestibility of protein and lysine. **Protein-rich ingredients that are digested more efficiently in the small intestine, such as soybean meal, may be used in rations for growing horses**, rather than relying upon the protein content in alfalfa hay.

Significant attention has been given to alfalfa and its possible connection to developmental orthopedic disease (DOD). See *Equine Review* article SU-07 for more information on DOD. The exact cause of DOD is not known, though nutritional factors such as excessive energy or phosphorus (but not excessive calcium unless in combination with energy) have been investigated and given some merit. Superfluous protein in the diet has been ruled out as a cause of DOD. Overfeeding of alfalfa can lead to extreme energy intake, which may lead to DOD, but high levels of protein and calcium are not predisposing factors.

Performance horses— As work intensity increases, energy needs rise. Because alfalfa hay generally has a **higher energy content** than grass hays of the same quality, there may be a slight advantage in feeding it to hardworking horses. Horsemen should **look to the concentrate when trying to add calories** to a ration, as there are many high-fat, high-fiber feeds manufactured and marketed expressly for performance horses.

Pregnant mares— The nutritional demands of pregnant mares do not exceed maintenance requirements until the last three months of gestation. **To meet the mare's escalating nutritional needs in late gestation, early-bloom alfalfa can be fed ad libitum.** Careful attention should be placed on the mare's weight, as **some tend to become overweight** while being fed alfalfa hay at the rate necessary to meet energy requirements. When enough alfalfa hay is fed to satisfy energy needs, an overabundance of protein (179%) and calcium (290%), but insufficient phosphorus (78%), may be consumed.

Lactating mares— From a metabolic standpoint, lactation is an expensive endeavor for mares. As such, **alfalfa hay alone cannot meet energy requirements imposed by lactation;** therefore, a concentrate must be fed to supply energy to the mare. Because of alfalfa's low phosphorus content, a concentrate with sufficient phosphorus should be fed. Alfalfa may be a suitable forage to complement a lactating mare's concentrate.

Alfalfa or Grass?

Alfalfa for Every Horse? As the aforementioned examples demonstrate, alfalfa may have a place in the management of different classes of horses. **Even in some of the most physically challenging equine sports such as racing and endurance racing, grass hays such as timothy are preferred to alfalfa.** Not only is timothy a traditional hay for racehorses, but its palatability is thought by some horsemen to be second to none, even when baled past its prime. Endurance riders select high-quality grass hays in an effort to skirt high-protein alfalfa. Some endurance enthusiasts believe protein-rich forages such as alfalfa increase thirst and urination, which may lead to dehydration, a condition that can seriously sideline an endurance competitor.

Nonworking horses represent the majority of horses in the United States. **Mature, idle horses do not require alfalfa hay for general well-being.** A horse that does little work, from a performance or physiologic perspective, has low nutrient needs. Feeding alfalfa to such horses may lead to obesity and an empty wallet!

Enteroliths. The formation of enteroliths, or intestinal stones, is another problem that appears linked to consumption of alfalfa. Enteroliths are formed when layer upon layer of mineral, typically magnesium and phosphate, envelop a pebble or other foreign, indigestible material. Taken singularly, enteroliths are not harmful; they are similar to benign tumors in this way. It's their position within the body that does or does not make enteroliths relevant. When they form in the intestine and block the progression of ingesta through the gastrointestinal tract, enteroliths become nuisances, sometimes life-threatening ones. Because of alfalfa's elevated magnesium concentration and its high protein content (which may boost intestinal ammonia levels), **alfalfa has been implicated as a possible cause of enteroliths.** *For more information on enteroliths, please see HL-07.*

Keep A Close Eye on Kidneys? Horses have no problem digesting the nutrients in alfalfa, though they will often drink more water in an effort to flush urea, the by-product of protein digestion, from the bloodstream. Yes, the kidneys must work harder to filter urea from circulation but kidneys are designed for this very function. If, however, a horse's kidney health has been compromised due to a previous medical condition, alfalfa is probably not a suitable forage choice and alternatives sought.

Blister Beetles. Though hundreds of species of blister beetles are found in North America, less than ten species are known to **cause poisoning in horses** by congregating in alfalfa hay. The actual toxin in the beetles, cantharidin, is a powerful irritant. Not only does it cause irritation of the digestive tract, but because it is absorbed rapidly into the bloodstream and excreted in the urine, cantharidin inflames urinary tract tissues, too. The level of cantharidin necessary to induce lethal toxicity is unclear; however, preliminary studies suggest 125 beetles for an average-sized horse. Carefully screening hay prior to feeding should alleviate concerns surrounding blister beetles.