

# EVALUATING HAY FOR HORSES: MYTHS AND REALITIES

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## ABSTRACT

Alfalfa hay can be an excellent feed source for many horses. Alfalfa is a good source of many nutrients including protein and calcium, and is a very palatable feed. The nutrient composition of alfalfa will vary with the maturity of the plant at the time of harvest and this will affect the suitability of the hay for feeding various classes of horses. Alfalfa hay cut in late maturity can be used for mature horses at maintenance or in light work and for mares in early pregnancy, while hay cut in early maturity is useful in rations for young horses and lactating mares. Early maturity alfalfa hay must be fed carefully to horses with low nutrient requirements (such as horses at maintenance) to prevent horses from overeating. As with any hay, alfalfa hay offered to horses must be free from dust and mold.

## INTRODUCTION

There are strong regional differences in alfalfa use in the horse industry. In a recent survey (NAHMS, 1998) alfalfa use was reported on about 50% of the horse operations in the Western U.S. but was much lower (only about 20%) in horse operations in the South and Northeast. Some of the regional variability exists because of differences in availability of good quality hay. However, many horse owners also have strong opinions about alfalfa hay and may specifically avoid its use. If a group of horse owners is questioned about alfalfa hay, some will respond that alfalfa is the best hay for horses while others will state that alfalfa is "too rich" for horses. Although these two opinions seem completely contradictory, they can both have elements of truth. In general, when alfalfa hay is selected and used appropriately, it is a very effective roughage source in horse rations. The best use of alfalfa hay occurs when the nutrient value of the hay is matched to the nutrient requirements of the particular horse (or horses) being fed. In addition, close attention to the cleanliness and hygienic quality of alfalfa hay is essential when it is used for horses.

## SELECTING HAY FOR HORSES

Recognition of differences in nutrient content of various hays allows us to match hay type to horse type. Alfalfa is typically much higher in protein and calcium than other hays used for horses and may also be higher in energy and total digestible nutrients. Table 1 illustrates the differences between alfalfa and several other hays commonly fed to horses. Because alfalfa is more nutrient dense, it is almost always a better value when the price per ton of various hays is similar. In addition, because alfalfa tends to be more palatable, horses will usually waste less, which also enhances its economic value.

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**Table 1: Nutrient Value of Various Hays Commonly Fed to Horses**

Hay Variety	Digestible Energy (Mcal/lb)	Total Digestible Nutrients (%)	Crude Protein (%)	Calcium (%)	Phosphorus (%)
Alfalfa	.8 to 1.1 Mcal/lb	48 to 55%	15 to 20%	.9 to 1.5%	.2 to .35%
Timothy or Orchard Grass	.7 to 1.0 Mcal/lb	42 to 50%	7 to 10%	.3 to .5%	.2 to .35%
Tall Fescue	.7 to .9 Mcal/lb	40 to 48%	5 to 9%	.3 to .5%	.2 to .35%

As shown in table 1, the exact level of nutrients in any hay type is variable. The biggest determining factor in nutrient content of alfalfa hay is the stage of maturity at harvest. Very early maturity alfalfa hay often has a soft texture, is very leafy, and has a high nutrient density and palatability. Conversely, plants harvested in late maturity will have more stem and less leaf than plants harvested in early maturity, and the stems will usually be thick and woody. The older the plant is at the time of harvest the lower the nutrient value and the palatability.

Horse owners/managers have been trained to associate hay quality with leafiness. As a result, many people will select early maturity hay and discriminate against more mature hay regardless of the type of horse being fed. However in many cases, mid-to-late maturity alfalfa hay is a more appropriate feed source than early maturity alfalfa hay, especially for horses with lower nutrient requirements. Barren mares, retirees and horses used for light recreational riding have relatively low nutrient requirements and can meet most, if not all, of their nutrient requirements with hay alone even when they are fed late or mid-maturity alfalfa. Table 2 gives some general guidelines for hay consumption by horses of different classes when they are fed alfalfa hay of early, mid or late maturity. Note that when early maturity alfalfa hay is fed to horses at maintenance, the recommended intakes are very low. If horses receive low levels of feed (even when nutrient requirements are satisfied) they are inclined to redirect their chewing needs on other objects such as fences, stalls, or trees. Consequently, it is not desirable to restrict hay intake in horses at maintenance. Alternatively, if horses with low nutrient needs are given free access to early maturity alfalfa hay, excess nutrient intake and weight gain will occur.

Early maturity alfalfa hay is most effective in feeding programs for horses with high nutrient requirements, such as growing horses and lactating mares. Early maturity alfalfa hay is very palatable and provides more nutrients in less volume so it is also very useful for horses with poor appetites. Lactating mares, growing horses and horses in moderate to heavy work usually cannot eat enough of any hay to meet their relatively high nutrient requirements, and thus these horses will need some grain in their diets. However, when early maturity hays are fed, the amount of grain in the diet can often be reduced. High grain intakes have been implicated as a risk factor in equine colic, therefore any management practice that reduces grain intake may reduce colic risk as well. Whenever horses are fed large amounts of grain, they should still be fed at least 1 lb of hay for every 100 lb of body weight. Thus, the

minimum daily hay intake for any 1100 lb horse is 11 lb/day. This amount of hay will not meet a horse's nutrient needs, but it will provide enough fiber to maintain the health of the gastrointestinal tract.

The type and amount of other feeds in the ration will always impact the amount of hay consumed, but in general, horse owners/managers should try to maximize forage intake and then supplement with grain or other feeds to meet any unfulfilled requirements. One of the big advantages of alfalfa over other hays is the amount of protein it provides. When alfalfa hay is fed, the amount of crude protein provided by the grain can be reduced. Reducing the protein level in the grain usually results in an economic saving.

**Table 2: Approximate Daily Intakes when Different Maturities of Hay are Fed to Horses with Average Mature Weight of 1100 lb<sup>a</sup>.**

Type of Horse	Late Maturity	Mid Maturity	Early Maturity	Comment
Maintenance, Very Light Work, Early Gestation	24 lb/d	20 lb/d	16 lb/d	More hay may be needed in cold winters; some grain may be necessary for a few horses
Late gestation	22 lb/d	20 lb/d	18 lb/d	Many mares will not eat more than 20 lb of hay/d and will need grain if late maturity hay is fed; all will need some mineral supplement
Lactation	28 lb/d	22 lb/d	18 lb/d	Most lactating mares will need about 6-8 lb of grain/d in addition to hay
Yearling	25 lb/d	20 lb/d	15 lb/d	Most will require grain in addition to hay. Amount of hay and grain will vary with age, type of hay and situation (sale preparation; breaking, etc)
Weanling	15 lb/d	11 lb/d	8 lb/d	All will need grain and hay. Amount of hay and grain will vary with age; most will need 5-9 lb of grain/d
Performance Horse	22 lb/d	18 lb/d	14 lb/d	Amount of hay and grain will vary depending upon level of work; most will receive 6-12 lb of grain/d

<sup>a</sup> When horses have no access to pasture. When pasture is available, the amount of hay needed will be reduced.

## QUESTIONS, MYTHS AND REALITIES

Myth or Reality? *"The high level of protein in alfalfa will damage my horse's kidneys!"* Myth! Feeding programs based on alfalfa hay often provide protein in excess of a horse's requirement, particularly when large amounts of alfalfa are fed to mature horses at maintenance or light work. However, there is no evidence to suggest that a moderate dietary excess of protein is detrimental to healthy, mature horses. Protein is made up of amino acids which are composed of carbon, hydrogen, oxygen and nitrogen. When horses (or humans!) consume more protein than they need, the carbon, hydrogen and oxygen portion of the amino acids is used for energy and the excess nitrogen is excreted in the urine. Thus it is possible that horses consuming high protein diets will drink more water and urinate more than horses consuming a lower protein diet, but there is no reason to believe that a horse's kidneys will be damaged when this occurs.

Question: *"Can I feed alfalfa cubes instead of alfalfa hay?"* Yes. Alfalfa cubes are an acceptable alternative to baled alfalfa hay. Voluntary consumption may be higher when alfalfa cubes are fed than when long hay is fed. There are two potential advantages of alfalfa cubes over baled hay. The first advantage relates to dust; hay cubes usually have less dust than long hay. The second advantage relates to waste; there may be less waste when hay cubes are fed. Currently, hay cubes are used more commonly in the Western U.S. than in other areas. However, even in the West, only about 10% of horse operations include hay cubes in their feeding program (NAHMS, 1998).

Myth or Reality? *"Alfalfa is too rich for broodmares and young horses!"* Myth! While alfalfa hay is a more nutrient-rich feed than most other hays, it is not any richer than many other feeds commonly used for horses. For example, the horse's most natural feedstuff, good quality pasture, is often higher in calories and protein than alfalfa hay! When horses graze rapidly growing cool season grass pasture in the spring and early summer in Kentucky, they are consuming food that contains 18 to 20% crude protein on a dry matter basis! By comparison, mid-maturity alfalfa hay will contain 16 to 18% crude protein on a dry matter basis. For horses that are relatively inactive, and are not growing or lactating, mid to late maturity alfalfa hay will be a more appropriate feed than early maturity alfalfa.

Myth or Reality? *"Preservative-treated hay isn't safe!"* Myth! A study conducted at the University of Illinois found that yearlings receiving hay treated with a mixture of acetic and propionic acid consumed just as much and gained just as much over a 1 month feeding period as yearlings consuming untreated hay. Clinical measures of well-being such as serum enzyme levels were not affected by consumption of preservative treated hay, indicating the hay had no negative effects on the horses. A study performed at Cornell University found that when given a choice, horses preferred alfalfa that was not treated with a preservative over alfalfa that had been treated with a mixture of acetic and propionic acid.

Myth or Reality? *"A little mold won't hurt!"* Myth! Beyond any doubt, the most important characteristic of good horse hay is cleanliness. Any hay (alfalfa, timothy, clover, fescue) that contains dust or mold will probably make a horse cough. Coughing is abnormal and not insignificant. Many horses develop permanent lung damage after consuming moldy or dusty

hay. This chronic lung damage, commonly referred to as heaves, affects the horse's ability to breath normally and impairs their ability to exercise. Once a horse has been sensitized to hay dust, mold or pollen, it may react even when clean hay is fed. Moldy hay may also have other negative health effects as well. Therefore moldy hay should never be used for horses. In general, alfalfa is not any more likely to make a horse cough than any other hay, as long as it is dust and mold free.

Myth or Reality? *"Hay that has been stored in the barn for a year or more has lost its nutrient value"* Myth! As long as hay has been stored in a dry environment, it is suitable for feeding for a long time after harvest. The amounts of energy, protein, calcium and phosphorus in a bale of hay in dry storage are basically the same after 2 years of storage as they are after 2 months of storage. One nutrient that does change with storage is vitamin A. However the greatest loss of vitamin A activity occurs right after harvest, and the amount of change from 6 months to a year or more is relatively small. Long term storage may increase dryness of hay. Hay that is very dry will be brittle and sustain more leaf shatter, so wastage during feeding may go up. Hay that has been stored for a long time may also have an increased level of dustiness, probably due to the increased dryness.

Question: *"Can large round bales of alfalfa be used for horses?"* Yes and no. Large round bales that are stored in a barn can be used for horses. However, round bales should be used in situations where there will be enough horses consuming hay to use up the bale in few days. When a round bale is in a paddock with only one or two horses, it will be exposed to the elements for an extended period and mold formation is likely. Round bales that have been stored outside without cover usually have a large amount of spoilage and should not be used for horses. Round bales can be a convenient way to feed large groups of horses but the amount of hay wasted is probably higher with round bales than with conventional bales.

## REFERENCES

Lawrence, L.M. K.J. Moore, H.F. Hintz, E.H. Jaster and L. Wischover. 1987. Acceptability of alfalfa hay treated with an organic acid preservative for horses. *Can. J. Anim. Sci.* 67:217

NAHMS. 1998. Part II. Baseline Reference of 1998 Equine Health and Management National Animal Health Monitoring System, USDA:APHIS:VS, Ft Collins CO

NRC 1989. Nutrient Requirements of Horses. National Academy Press, Washington D.C

Raymond, S.L., E.F. Curtis, L.M. Winfield and A.F. Clarke. 1997. A comparison of respirable particles associated with various forage products for horses. *Equine Pract.* 19:23.

Russell, M.A. and G.A. Rich. 1993. Selecting hay for horses In, The Horse Industry Handbook, American Youth Horse Council, Lexington KY

Todd, L.K., W.C. Sauer, R.J. Christopherson, R.J. Coleman and W.R. Caine. 1995. The effect of feeding different forms of alfalfa on nutrient digestibility and voluntary intake in horses. *J. Anim. Physiol. (Anim. Nutr.)* 73:1