



Stretching Your Hay Supply What to Feed When Hay is Scarce?

Lori K. Warren, PhD, PAS
Dept. of Animal Sciences, University of Florida

Basic Feeding Guidelines:

- High-fiber roughages should make up the majority of the horse's diet.
- Ideally, horses should be fed 1.5 to 2.0% of their body weight per day as roughage. A minimum of 1% of body weight as roughage is needed to maintain normal digestive function.
- If grain is needed to maintain body condition, divide the daily portion into several smaller meals. Each grain meal should not exceed 0.5% of body weight.
- Make any changes to the diet gradually over 1 to 2 weeks.
- Provide free-choice access to water and salt.

Drought conditions result in poor hay production and rising feed costs. Because Florida imports a large amount of hay, we are also at the mercy of drought in other states. As a result, we are often forced to find alternative feed sources to either “stretch” our limited hay supply, or completely replace it.

Knowledge of how to adjust the diet begins with an understanding of how much your horse can eat. Horses should be fed between 1.5% and 3.0% of their body weight per day in total feed (i.e., hay plus grain). The amount of feed should be adjusted based on the quality of the forage, the addition of grain to the diet, the horse's physiological state (e.g., growth, lactation, level of work), and the desired level of body condition. Expected daily feed intake, as a percent of the horse's body weight, is presented in Table 1.

Roughages, including hay and pasture, are the most important component of your horse's diet. Roughages provide essential sources of digestible energy, protein, and some vitamins and minerals. Roughages also supply dietary fiber required for the normal function of the horse's digestive system. Ideally, horses should receive 1.5 to 2.0% of their body weight per day as roughage. A minimum of 1.0% of body weight as roughage is needed to maintain gut health.

Roughages, by definition, are feeds that are high in fiber (minimum 18% crude fiber). In addition to hay and pasture, there are many other high fiber feeds that can be used to totally replace or partially replace the roughage portion of your horse's diet. Table 2 lists some alternative roughage sources, along with their replacement value relative to grass or alfalfa hay.

Table 1: Expected daily feed intake as a percent of body weight*

Class of horse	Roughage	Grain	Total
Mature, idle horse	1.5 – 2.0	0 – 0.5	1.5 – 2.0
Working horses**	1.0 – 2.0	0.5 – 1.5	1.5 – 2.5
Mare, late gestation	1.0 – 2.0	0.5 – 1.0	1.5 – 2.5
Mare, lactation	1.0 – 2.0	0.5 – 1.5	2.0 – 3.0
Weanling	1.0 – 1.5	0.5 – 1.5	2.0 – 3.0
Yearling	1.0 – 1.5	0.5 – 1.5	2.0 – 2.5

*Adapted from NRC (1989) *Nutrient Requirements of Horses*

**Depends on intensity of work.

Feeds with moderate levels of fiber (11-15% crude fiber) can also help you cut back on the amount of hay you feed. However, these lower fiber feeds cannot totally replace all of roughage or hay your horse needs—some hay (or adequate time on pasture) will still be needed. This is because many of these feed ingredients are also very high in starch. Even fiber-added commercial products that fall into this category often have more starch than hay. Consumption of large amounts of starch is associated with a greater risk of gastric ulcers, colic and laminitis. As a guideline, provide your horse with at least 1.0% of its body weight per day in hay. Then use feeds with a moderate level of fiber to help complete the remaining portion of your horse's ration. Table 3 lists feeds with a moderate level of fiber that can be used to replace 2 to 6 pounds of the hay you feed your horse.

Take Good Care of Your Pastures

Pasture is the most natural source of roughage for the horse; but similar to hay production, drought can negatively affect pasture availability. Ensure that your pastures make it through a dry spell by:

- 1) Fertilize pastures based on soil test results and at the appropriate time of year.
- 2) Prevent overgrazing by removing horses from the pasture before the grasses are grazed down below 2 or 3 inches and bare spots develop.
- 3) Alter your turnout schedule to include shorter turnouts of 1 to 3 hours, instead of all day. Limiting pasture access to just a few hours each day will not only reduce drought stress to your pasture, but has the added benefit of providing your horse with some nutrition, thereby reducing the amount of hay you need to supply.
- 4) Consider investing in a sprinkler or irrigation system. Even if you irrigate one or two of your pastures, the additional grass may be enough to prolong pasture use and reduce hay feeding.
- 5) Overseed ryegrass or oats in the fall (Oct/Nov) to provide grazing during the winter months.

Other Feed-Related Concerns

Unfortunately, drought conditions bring other concerns besides difficulty in finding hay. The following are some feed-related issues to be aware of when looking for hay:

- *Inspect hay shipped in from other states*

Florida routinely has hay shipped in from the northern states. During a drought, whether experienced here or elsewhere, the quality of the hay coming into Florida may not always be ideal. Some hays may be overly mature and stemmy, which could be a problem if your horse was accustomed to a forage of higher nutritional value. Avoid hays that are weedy, as some weeds can be poisonous. Be cautious of alfalfa grown in western states where drought conditions can cause greater plant uptake of selenium. Florida is known to be selenium deficient; thus, our horses typically receive selenium supplementation, which can create toxicity when combined with forage that is also high in selenium.

- *Use of hay stored for more than one year*

Hay that is stored under cover and protected from sun and rain loses very little of its nutritional value, with the exception of vitamins E and A. Therefore, hay that has been properly stored for one or two years might provide a reasonable alternative to your usual hay supply. However, to prevent a vitamin deficiency, your horse should receive supplemental vitamin E and vitamin A when feeding hay that has been stored for more than one year.

- *Avoid moldy hay*

- *Monitor your horse for colic*

Drought itself doesn't cause colic, but changes to the feeding program when dealing with feed shortages could cause colic. To prevent colic, make all changes to the diet gradually over 10 to 14 days—this requires planning ahead for feed shortages. Prevent excessive sand intake by ensuring pastures are not overgrazed. Provide free-choice access to salt and water at all times.

Table 2: Alternative roughage sources that can be used to totally replace or partially replace your horse's hay.

Alternative Roughage	Can be used for <i>total</i> replacement of hay	Can be used for <i>partial</i> replacement of hay	Replacement Value*		Comments on Roughage Alternative
			Amt. needed to replace 1-lb grass hay	Amt. needed to replace 1-lb alfalfa hay	
Alfalfa hay	✓	✓	0.85 lbs	1.0 lb	Higher protein and calcium than grass hays, so will feed less.
Perennial peanut hay	✓	✓	0.85 lbs	1.0 lb	Similar to alfalfa hay.
Grass hay	✓	✓	1.0 lb	1.2 lbs	Many types of grass hay: timothy, brome, orchardgrass, fescue, etc.
Bermudagrass hay	✓	✓	1.0 lb	1.2 lbs	Varieties include Coastal and Tifton-85; Similar nutrition as other grass hays.
Millet hay	✓	✓	1.3 lbs	1.6 lbs	Usually contains some millet grain; Less nutritional value than most grass hays; May have a laxative effect if feed as the only roughage.
Sorghum grass	Not recommended				Includes Johnsongrass, Sudangrass, & sorghum-Sudan hybrids; May cause neurological problems in horses.
Alfalfa hay cubes	✓	✓	0.85 lbs	1.0 lb	Alfalfa that has been chopped and cubed; Similar nutrition as alfalfa hay (see above).
Alfalfa/timothy hay cubes	✓	✓	0.95 lbs	1.1 lbs	Combination of alfalfa and timothy forages; Less protein and calcium than straight alfalfa, but more than plain timothy.
Chopped hays (chaffs)	✓	✓	Varies	Varies	Type of hay (or straw) will dictate feeding value; some products contain added fat or molasses that alter feeding value. Consult feed manufacturer for feeding guidelines.
"dehy" alfalfa pellets	✓	✓	0.85 lbs	1.0 lb	Pelleted alfalfa hay; Similar nutrition as alfalfa (see above).
"Complete" feed	✓	✓	0.70 lbs	0.85 lbs	Contains a mixture of grains and roughage sources; Designed to be fed without hay; Should contain at least 18% crude fiber if no hay is fed; Example = senior feeds.
Haylage	✓	✓	1.55 lbs	1.85 lbs	Hay preserved by ensiling rather than traditional drying; Higher moisture than hay, so will have to feed more; Can spoil (mold), so feed contents of bag within 2-3 days.
Oat hay	✓	✓	1.0 lb	1.2 lbs	Nutritive value similar to grass hays.
Straw	✓	✓	1.25 lbs	1.5 lbs	Oat straw more palatable than wheat or barley straw; Bulky, high fiber, low in other nutrients; Will require protein, mineral and vitamin supplementation.
Beet Pulp	NO	✓	0.70 lbs	0.85 lbs	Good source highly digestible fiber; Relatively high in calcium; May require soaking before feeding; Limit to 10 pounds (dry weight) per day or less.
Soy hulls	NO	✓	0.8 lb	1.0 lbs	High fiber, but more digestible than other hulls. Limit to 5 pounds per day or less.

*Replacement values based on average digestible energy content of feeds. Feed amounts may have to be adjusted due to variation between sources of feed and horses.

Table 3: Moderate fiber feed sources that can be used to replace a portion of the hay in your horse's diet.*

Moderate-Fiber Feed Alternatives	Can be used for <i>total</i> replacement of hay	Can be used for <i>partial</i> replacement of hay	Replacement Value**		Comments on Moderate Fiber Feed Alternative
			Amt. needed to replace 1-lb grass hay	Amt. needed to replace 1-lb alfalfa hay	
Rice bran	NO	✓	0.50 lbs	0.60 lbs	High in fat and phosphorus; More fiber than most grains (similar to oats), but less fiber than hays and other roughages; Diet may require additional calcium supplementation if product is not already balanced by the manufacturer, if 2 lbs or more rice bran are fed per day, and/or if horse is also receiving plain, unfortified grains (e.g., oats); Maximum amount of rice bran usually limited to 2 pounds per day.
Wheat bran	NO	✓	0.60 lbs	0.70 lbs	More fiber than most grains (similar to oats), but less fiber than hays and other roughages; High in phosphorus; Diet may require additional calcium supplementation if 2 lbs or more wheat bran are fed per day and/or if horse is also receiving plain, unfortified grains (e.g., oats); Maximum amount usually limited to 5 pounds per day.
Oats	NO	✓	0.65 lbs	0.75 lbs	Not a high fiber feed, but contains more fiber than other grains; Limit to 1% of horse's body weight or less; Ensure at least 1% of body weight is fed as high fiber roughage; Fortification of diet with vitamin/mineral supplement may be necessary.
Fiber-added feeds (11 – 15% crude fiber)	NO	✓	Varies	Varies	Commercial feeds containing added fiber sources (i.e., beet pulp, soy hulls, peanut hulls, etc) can be fed to reduce the amount of hay needed. Most of these feeds still contain grains (oats, corn, barley) or grain by-products (wheat middlings, wheat bran), so total amount offered should be limited to 1% of horse's body weight or less. The amount of hay that can be replaced by these products varies based on the level and type of fiber and the fat content. Consult the feed manufacturer for feeding recommendations.

* Feeds in this table cannot replace all of the hay you feed your horse, but can replace 2 to 6 pounds of hay, depending on the product selected (see comments). All horses should receive a minimum 1% of its body weight per day as hay or some other high fiber roughage (18% crude fiber or greater).

**Replacement values based on average digestible energy content of feeds. Feed amounts may have to be adjusted due to variation between sources of feed and horses.