

Decreasing Costs of Feeding Horses

► Feeding costs represent one of the greatest expenses on horse farms, and implementing adequate feeding management can be a good alternative to decrease these costs. For proper feeding management, the knowledge of the nutritional requirement of horses is fundamental.

Nutritional requirements for horses vary with animal category and each animal's level of activity. See table 1 for the daily nutritional requirements for digestible energy and crude protein. These requirements are calculated based on animal body weight and desired level of intake, which will be discussed later in this document.

To determine the nutritional requirements specific to your horse, access the National Research Council (NRC) online calculator. The calculator is straightforward, and the delivered requirements are easy to understand. The NRC calculator uses the metric system with kilograms (kg) and grams (g). If you want the requirements in the imperial system of pounds (lb), make sure you use proper conversion factors. Although dependent on the horse category and plane of nutrition of the diet, horses' daily dry matter intake ranges between 1.5 and 2.5 percent of their body weight. Expected daily intake must be calculated on a dry-matter basis to ensure adequate nutrient intake and fairly compare nutrient content among feeds. For instance, 1 kg of fresh forage, which usually has 30 percent of dry matter, contains 700 g of water and 300 g of nutrients, while 1 kg of hay or concentrate feed, which generally has 90 percent of dry matter, contains 100 g of water and 900 g of nutrients. Thus, only 30 percent of the consumed forage provides nutrients when offering fresh forage, while 90 percent of the hay or concentrate feed provides the horse with nutrients.

A healthy diet includes balanced amounts of energy, minerals, protein, vitamins, and water. Generally, proteins and energy are the most expensive nutrients in a horse's diet. A lack of understanding about the horse's needs can often lead to owners overspending on those feedstuffs. Consult a horse nutrition specialist for additional information about feeding horses or refer to Extension publication ANR-1355 "10 Rules for Feeding



Horses" (ANR-1355). In addition to feeding management strategies, this document will present strategies to decrease the costs of feeding horses.

Reducing Feeding Costs

1. Make good-quality forage the basis of your feeding program.

Generally, forage crops are less expensive than grains and are crucial for a healthy diet for horses. Forages are commonly much less expensive than concentrate feed. Grazable forages can cost four times less than conserved forages, such as baleage and hay, and eight to fifteen times less than concentrate feed.

Most mature horses can meet their maintenance requirements on good-quality forage without additional grain. Leisure horses consume from 1.5 percent to 2.5 percent of their body weight of forage on a dry-matter basis per day, depending on the forage quality. Thus, a 500-kg horse requires 7.5 to 12.5 kg of dry matter per day, representing 25 to 41.7 kg of fresh forage with 30 percent dry matter and 8.3 to 13.9 kg of hay with a 90 percent dry matter. High-quality forages are denser in nutrients and energy and are usually required in smaller amounts to meet the horse's nutritional needs compared

Table 1. Daily Nutritional Requirements by Animal Category for Horses

Animal Category	Body Weight (kg or lb)	Dry Matter Intake ¹ (kg or lb)	Digestible Energy (Mcal ²)	Crude Protein (g or lb)
Mature horse, maintenance	500 or 1102	10 or 22.0	15.2	540 or 1.19
Breeding stallions	500 or 1102	10 or 22.0	21.8	789 or 1.74
Pregnant mare, 9 months gestation	534 or 1177	10.7 or 23.5	19.2	797 or 1.76
Pregnant mare, 11 months gestation	566 or 1248	11.3 or 25	21.4	893 or 1.97
Lactating mare, foaling to 2 months	566 or 1248	11.3 or 25	31.7	1535 or 3.38
Lactating mare, 3 months	500 or 1102	10 or 22.0	30.6	1460 or 3.22
Lactating mare 6 months	500 or 1102	10 or 22.0	27.2	1265 or 2.79
Mature horse, light work ^a	500 or 1102	10 or 22.0	20.0	699 or 1.54
Mature horse, moderate work ^b	500 or 1102	10 or 22.0	23.3	768 or 1.69
Mature horse, heavy exercise ^c	500 or 1102	10 or 22.0	26.6	862 or 1.90
Weanling, 4 months	168 or 370	3.4 or 7.4	13.3	669 or 1.47
Weanling, 6 months	216 or 476	4.3 or 9.5	15.5	676 or 1.49
Yearling, 12 months	321 or 708	6.4 or 14.2	18.8	846 or 1.87
Yearling, 18 months not in training	387 or 853	7.7 or 17.1	19.2	799 or 1.76
Yearling, 18 months in training	387 or 853	7.7 or 17.1	22.1	853 or 1.88
2-year-old, not in training	429 or 946	8.6 or 18.9	18.7	770 or 1.70
2-year-old, light training	429 or 946	8.6 or 18.9	21.8	829 or 1.83
2-year-old, heavy exercise	429 or 946	8.6 or 18.9	27.9	969 or 2.14

¹ Dry matter intake set at 2% of the horse's body weight

² Megacalories.

^a Examples are horses used in Western and English pleasure, bridle path hack, equitation, etc.

^b Examples are horses used in ranch work, roping, cutting, barrel racing, jumping, etc.

^c Examples are race training, polo, etc.

Source: National Research Council. 2007.

to low- or moderate-quality forages. Similarly, when horses are offered concentrate feed, the total amount of daily dry matter required decreases due to the high concentration of nutrients and energy of concentrate feed. Regardless of the supplementation strategy, horses should not be fed less than the absolute minimum of 1.25 percent of their body weight recommended for maintaining equine health and ethological needs.

2. Purchase hay by weight and forage nutritive value.

Before purchasing hay, compare the cost of hay per ton to the cost of bale. Buy hay per ton and not per bale as bale weight is quite variable due to differences in density and moisture. Generally, visual assessment of hay quality helps raking hays from poor to good-quality hay. Good-quality hay has more leaves than stems (leaves are the most nutrient-rich part of the plants), a soft texture, and is free of dust, mold, and foreign material. Color is mistakenly thought of as the most important factor determining hay quality. However, hay color is affected by maturity at harvest, curing, and storage.

Although bright green typically means good quality, it is not always true. Sometimes sun-bleached hay is yellow golden on its outer edges but may be bright green inside. This does not always mean that it was cut at a late stage of maturity. The only hay color you might want to avoid is brown or black, which may indicate high moisture and mold.

Although visual estimation of the nutritive value of the hay is commonly helpful, only forage testing gives you the actual concentrations of the nutrients in the forage. Check with hay dealers to see if they have the hay tested for nutritive value. Otherwise, make sure you have your hay or pasture forage tested. Forage testing provides useful information on whether supplemental feed is required and how much more nutrients are needed. Lack of knowledge on the nutritive value of the forage is one of the main reasons for unnecessary cost with supplemental feed. However, a good and representative hay sample is required for an accurate forage testing report. For further instructions on how to collect a good hay sample for chemical analysis, visit the Alabama Extension website for publication "Collecting Forage Samples for Laboratory Analysis" (ANR-2224).

Be sure to match the quality of the hay with the horse's nutritional requirements. Adult horses not exercising may have their nutritional needs met with a low- to moderate-nutritive value. In contrast, horses with higher nutritional needs, such as exercising horses and lactating mares, usually need high-nutritive value forages to meet their nutritional needs. As mentioned previously, feed evaluation and comparison must be made on a dry-matter basis. Therefore, always look for the values on a dry matter basis on the forage testing report. Always select hays with nearly 18 percent moisture or lower as greater moisture increases the risk of molding or heating. The energy is reported as digestible energy (DE) and expressed as megacalories per kg (or lb) of forage. Hays with DE ranging from 1.5 to 1.8 Mcal/kg DM (0.68 to 0.82 Mcal/lb DM) are probably suitable for maintenance and overweight horses, while hays with 1.8 to 2.2 Mcal/kg DM (0.82 to 1.0 Mcal/lb DM) are probably suitable for hardkeeper horses and pregnant mares in earlier- to mid-gestation. Hays with DE greater than 2.2 Mcal/kg DM (1.0 Mcal/lb DM) are probably suitable for horses with greater nutritional needs such as young growing horses, broodmares in late gestation, lactating mares, and heavy to intense working horses.

Crude protein (CP) is one of the most expensive nutrients, yet it is commonly overfed on horse farms. Although harmless for horses, feeding protein over the nutritional requirement is detrimental to the environment and, in stalls, may result in the burning ammonia odor that can harm horse and human health. Target values are 5.5 percent to 9 percent CP for nonexercising mature horses, light and moderate working, and pregnant mares; 10 percent CP for intense working horses; 10 percent to 16 percent CP for growing horses; and 13 percent to 15 percent CP for lactating mares.

Be aware that hay harvested at a late stage of maturity is less digestible because of the greater fiber concentration. Hays with acid detergent fiber (ADF) greater than 40 percent are usually not suitable for horses as it is the least digestible component of the forage and results in hays with less energy levels. Neutral detergent fiber (NDF) is adequate in concentrations ranging from 50 percent to 70 percent, and greater concentrations also impair the digestibility of the diet and, hence, nutrient and energy absorption. Bear in mind that alfalfa hay, in addition to generally being more expensive, is usually highly digestible and too dense in nutrients and energy. Thus, it may not serve as the base of the diet of most horses and might be suitable as a supplement.

3. Read the guaranteed analysis on your feed label.

The guaranteed analysis on the label should meet your horse's nutritional requirements. Check the feed ingredient list on the feed label. The label must list the percentages of crude protein, fat, and the maximum percent crude fiber. If providing a feed that exceeds the animal's needs in an unbalanced diet, then the animal will probably fail to benefit from what is provided, and exceeding nutrients might be excreted via feces or urine, resulting in unnecessary costs with supplemental feed. For more information about feed labels, see Extension publication "Reading the Feed Tag" (ANR-1354).

4. Do not waste money on additional supplements.

If an animal's diet is well balanced, it may not need additional supplements. Although the horse can excrete most excess nutrients from its body, supplementation of minerals and vitamins above the requirements results in unnecessary cost with supplemental feed. Additionally, some vitamins and minerals can be harmful in amounts above safe upper levels. For instance, supplementation of water-soluble vitamins, such as biotin, above the requirement may simply result in excretion of exceeding biotin and a waste of money. However, fat-soluble vitamins, such as vitamin A, D, and E, may result in serious issues.

Excess vitamin A (above 16,000 IU of retinol/kg of DM consumed) can result in abnormal bone growth, poor hair coat, skin conditions, and decreased blood clotting. Similarly, selenium supplementation above the tolerable maximum intake level of 2 mg/kg of DM consumed may result in some toxicity symptoms, such as hair loss of mane and tail and cracking of the hooves, excess salivation, and respiratory failure.

5. Feed to meet the requirements of individual horses.

Once a horse has achieved its correct body weight, adjust the feeding management to keep its body weight constant. It takes more feed and costs more money to put weight on a thin horse than to maintain a proper body condition, which falls in a score between 4 to 6 on a scale from 1 to 9.

On the other hand, overfeeding horses can easily lead to colic and founder. The risk is increased when feeding high-starch diets, such as high amounts of concentrate feed in the diet. If high amounts of concentrate feed are needed, do not feed more than 0.4 percent of the body weight in concentrate feed in a single meal. If larger amounts are fed, there is a chance the capacity of the foregut to digest starch is overpassed, and the

undigested starch may reach the hindgut, resulting in excessive fermentation leading to colic or laminitis.

If you must feed horses in groups, use individual feeders. This is particularly important for horses that have a high-grain requirement. Placing feeders far apart is a good alternative. Also, having all horses eating at the same time helps.

6. Maintain an appropriate deworming schedule.

Although not fatal to horses, parasite infestations may damage the digestive tract of horses, eventually preventing them from acquiring nutrients from ingested feed. Parasite infestations may result in colic, diarrhea, poor hair coat, slow growth, and weight loss. Some horse owners may think these are diet-associated problems and try to overcome them by increasing amounts of feed or changing the diet of the horses.

Perform fecal egg counts to determine deworming intervals for individual horses and choose a deworming product that effectively kills the parasites found on your farm. If fecal egg counts indicate that your dewormer is ineffective, seek professional help to switch products.

7. Maintain a regular schedule of dental care.

Because of the continuous eruption of teeth throughout their lifetime, horses require proper chewing to maintain adequate teeth wearing. Modification of the diet and eating pattern of horses throughout domestication and confinement results in commonly observed irregular wear on the teeth and formation of sharp points.

Decreased proportions of forage in the diet is one of the main causes of dental abnormalities in horses.

Without adequate dental health, food may not be appropriately chewed, impairing proper digestion and, consequently, nutrient acquisition from the feed ingested. Decreased digestion results in a greater proportion of the nutrients consumed being excreted in feces, which increases the cost of the diet per amount of nutrient retained in the body. Nonetheless, poor dental health can cause colic and weight loss and affect the horse's well-being, behavior, and performance. For these reasons, the horse's mouth should be examined yearly for sharp points on the molars or other problems.

8. Measure horse feeds by weight rather than by volume.

Feedstuffs vary in density, so a scoop of oats versus a scoop of pellets will have different weights. Commercial concentrates may also vary across manufacturers or even from batch to batch. The same is true for hay, as not all flakes or blocks within a bale are the same weight. A simple kitchen scale can be a handy tool in the feed room for ensuring that your horses get the appropriate amount of feed. Weighing feeds and gradually making any changes in feed types and amounts can greatly reduce digestive problems in horses.

For additional questions, please consult your Alabama Cooperative Extension Animal Science and Forage Regional Extension Agent.



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