

University of Missouri Extension

G2806, Reviewed October 1993

Feeds for Light Horses

Melvin Bradley and W.H. Pfander
Department of Animal Sciences

Feed is the greatest expense of owning a horse. You can minimize your expenses by:

- Keeping a healthy horse,
- Feeding a balanced ration according to need, and
- Purchasing feeds that will satisfy the nutritional needs of the animal and the economic and logistical needs of the owner.

Ingredients needed

Feed ingredients needed for horses are the same as for other livestock. They are carbohydrates, fats, protein, minerals, vitamins and water. The first three of these can yield energy. Major sources of energy and protein are grains and roughages, including pasture.

Energy values of grains and roughages are commonly expressed in terms of total digestible nutrients (TDN). Grains usually range from 65 to 80 percent TDN, while hays range from 40 to 55 percent. Pasture grasses vary greatly according to kind, water content and stage of maturity. In vigorous growth they are higher in nutrients than hay. In dormancy and late maturity, they are considerably lower than they would have been if cut at the right stage for hay.

Are oats and timothy hay necessary?

Much credit has been attributed to oats and timothy hay for horse feed, especially by horse owners of a few years ago. However, when substitutions of other grains and hays were made, researchers have found it difficult to substantiate a need for either. As early as 1911, 365-day tests with hardworking mules at the Trowbridge Livestock Center on the MU campus showed less weight loss and 28 percent less feed cost with corn compared to oats fed with mixed hay. Respiration counts showed no difference in heat tolerance. But the mules seemed to tire of corn more than oats over the year-long test.

Horses relish oats. This fact, combined with the knowledge that less care is needed to avoid digestive problems with oats than corn because of the higher fiber contents of oats, has always made oats popular.

Many of the early problems with legume hays were due to dust and mold caused by inadequate harvesting methods. Light yields and sparse timothy leaves presented fewer harvesting problems.

Timothy hay and good oats fed together make a satisfactory ration for adult horses, but they are too low in protein, calcium and vitamins for brood mares and growing horses.

The Arabian horse, progenitor of most domestic breeds, attained excellence in a country that produced no oats or timothy hay.

Roughages

Succulent roughages

This category includes:

Pasture

Grass is the natural feed for horses. No one feed stuff is as complete in nutrients as green pasture grown on fertile soil, and few feeds are fed in a more healthful environment. Grass reduces cost, provides succulence in the ration, and furnishes minerals and vitamins that are sometimes lacking. Hardworking horses need supplemental energy feeds because of the high water content of grass. Dry grass usually is low in protein and vitamins, and heavy stocking rates pose a parasite problem.

Silage (15 to 20 percent TDN)

Various types of silage can be used to replace half of the hay ration. The silage must be of good quality and free of decay or mold and should be chopped fine. Good corn silage is preferred, but grain sorghum and grass silage can be used. Slowly work it into the rations of mature idle horses, growing horses, brood mares and stallions. It is too bulky for hardworking animals and foals. Legume haylage can replace silage with equal or superior results. The cost for most horse owners is prohibitive unless they combine it with a cattle feeding program.

Dry roughages

The most important consideration in selecting a dry roughage is that it be free of dust and mold or heaves and colic may result. Early cut hays, properly cured, are much preferred. They can be identified by color, head development on grass hays, leaf-to-stem ratio and, in legumes, size of stems. Bales should be broken to check for dust and moldy odor.

Confined idle adult horses will eat about 15 to 20 pounds of a good quality mixed hay daily when no grain is fed. You need not feed hay in amounts that cause gross wastage, nor should you limit it to amounts that force animals to eat stems.

Legume hays

These hays are higher in protein and minerals and are more palatable than grass hays. They make excellent horse feed and should be included in

the rations of young growing animals, breeding animals and many adult working horses. Legume hays include:

Alfalfa hay (50 to 56 percent TDN)

When properly cured, alfalfa is the best of the legumes from a nutrient standpoint. Its high protein, calcium and vitamin content make it especially useful in balancing rations for brood mares and young growing horses. Some halter showmen make extensive use of top quality alfalfa in show rations, especially with horses that are finicky about eating.

Although western work horses in irrigated districts in the past consumed much alfalfa free-choice, some horse owners consider it "heating" or "too laxative" and feed it as half of the roughage.

Clovers (50 to 52 percent TDN)

Many clover varieties are used alone or in combination with grass hays for horses. Red clover is similar to alfalfa and can be substituted for it, usually with slightly less beneficial results. It is lower in protein and usually has a higher ratio of stems to leaves than alfalfa.

Properly-cured Alsike clover is a good hay for horses.

Lespedeza (50 to 55 percent TDN)

When cut early, lespedeza makes an excellent hay. It is higher in protein than red clover. When it is cut late, many leaves are lost from shattering and the stems become wiry and low in digestibility. The calcium content is about half that of alfalfa.

Grass or non-legume hays

Grass hays yield less per acre and are lower in protein, calcium and vitamins, but they are less likely to be moldy and dusty than legumes. They are usually cut too late to yield quality hay and often are priced higher than their feeding value justifies.

Grass hays often are grown and harvested in mixtures with legumes, which produce an excellent combination suitable for almost any horse feeding program. Grass hays used in horse feeds include:

Timothy (46 to 52 percent TDN)

No other hay has attained the lasting popularity of timothy. Its wide range of climatic adaptability, ease of curing, bright color and freedom from dust and mold make it the horse owner's favorite. Since it is low in protein, it is a better feed for mature work horses than for stallions, mares or young growing stock. If it is fed as the only roughage, it should be supplemented with protein or be fed with a high protein grain such as oats instead of corn. Do not make special efforts to obtain timothy for horse rations because satisfactory substitutes can easily be found. Mature, late-cut timothy is a poor feed for any class of livestock.

Prairie hay (46 to 50 percent TDN)

Some horse owners satisfactorily substitute prairie hay for timothy. It is lower in protein, less bright in color and usually less palatable than timothy.

Bromegrass hay (46 to 52 percent TDN)

Bromegrass makes good horse hay. It is palatable when harvested in the bloom stage.

Orchard grass hay (46 to 52 percent TDN)

Orchard grass is much like bromegrass but not quite as satisfactory.

Cereal hays (45 to 50 percent TDN)

Cereals make good hays when cut early, but they are seldom cut early enough. Cut them in the soft-to-stiff dough stage. Oats, barley, wheat and rye hays are preferred, in that order. Horse owners in the Pacific Coast region make extensive use of these.

Grains

Grains are high-energy feeds used with hay to regulate energy intake of the animal commensurate with work performed, growth made and/or reproductive performance. Medium-sized, hardworking horses may need as much as 12 pounds or more of grain and an equal amount of hay daily to maintain body weight, whereas idle adult horses may get fat on grass alone.

Horses like grain. Some even bolt it to the point of choking. Most grains are improved by grinding or rolling, but none should be ground fine. Frequent feeds in small amounts are preferred with at least a half hour of rest for tired horses before grain is fed. Continued heavy grain feeding during a day off can cause a serious disease called Azoturia ("Monday morning" disease). In general, grain rations should be cut in half and hay feedings increased on days that working horses are idled. When substituting one or more grains for others, do it gradually. Grains used for horse feed include:

Oats (65 percent TDN)

Among grains, oats are the choice of most horse owners and horses. Because they are bulky, oats permit maximum liberty in their use with minimum danger of digestive disorders. Most fastidious horses find oats to their liking. Oats are higher in protein than most grains, which makes them useful with low-protein grass hays. However, half legume hay ensures a more complete ration when oats are fed as the only grain. Some disadvantages are expense on a TDN basis and variability in quality. Federal grades are number 1, number 2, number 3, number 4 and Sample, with 1 and 2 the best buys.

Although oats are an excellent horse feed, when cost and/or convenience dictate, most rations can be formulated satisfactorily without them.

Corn (80 percent TDN)

Corn is a good feed and is used extensively in the Midwest. About 15 percent less corn would equal a given weight of oats in energy value. For this reason, corn is especially useful for improving the condition of thin horses and maintaining the condition of those at hard work. It is often a good buy on an energy basis, even exceeding hay on occasion.

Because of its high energy content and low fiber, corn must be fed with more care than oats to avoid colic. Corn and oats, in equal parts, make an excellent grain ration. When fed according to the work that horses are performing and when large amounts are not given at one time, corn can supply all of the necessary grain.

Some horse owners consider corn a "heating" feed in warm weather. This theory is not easy to explain because "heat" produced in digestion is greater for fibrous feeds such as hays and oats than for corn. Probably a major reason is that horses eating corn tend to stay fatter than others, especially if they aren't exercised regularly.

Grain sorghum (80 percent TDN)

Grain sorghum can be substituted for corn in most rations. It varies in protein content from 6 to 12 percent, has little vitamin A, and some varieties are unpalatable. It is most satisfactory when used in a grain mixture. In some areas grain sorghum is often a better buy than corn. It should be cracked or rolled.

Barley (78 percent TDN)

Barley is a very satisfactory feed when ground and fed as described for corn. Fifteen percent wheat bran or 25 percent oats fed with barley almost eliminates the risk of colic.

Wheat (80 percent TDN)

Wheat is seldom fed to horses except in the Pacific Northwest. It can be fed as part of the grain ration (about one-third) when fed with a bulky feed. It should be rolled or coarsely ground. Wheat tends to be doughy when moist and produces palatability problems.

Wheat bran (66 percent TDN)

Wheat bran is highly palatable, slightly laxative and very bulky. Horse owners have long preferred "bran mashes" for animals stressed by extreme fatigue, foaling or sickness. Bran is reasonably high in protein, high in phosphorus and, like other grains, low in calcium. Because of its high cost on a TDN basis, it is generally used at levels of 5 to 15 percent of the ration.

Cane molasses (60 percent TDN)

The addition of 5 to 10 percent molasses will reduce dust and increase palatability of a ration. Greater amounts will make a ration too laxative. It is very low in protein and usually expensive on an energy basis. Dried molasses is often added to the grain ration to increase consumption.

Protein feeds

A horse's need for protein is relatively low and is easy to meet with practical rations. With the exception of milking mares, most 600- to 1200-pound horses need from 3/4 to 1 pound of digestible protein (DP) daily. If the roughage is half legume hay fed in adequate amounts, the protein need will be met. However, supplementing rations of young growing horses is insurance against a deficiency and stimulates appetite. The hair coat of horses being fitted for show will "bloom" to a higher degree when about 1 pound daily of an oil meal is supplied. Large amounts are laxative.

Protein supplementation is needed when poor quality late-cut grass hays are fed. Protein supplements that can be used in horse feeds include:

Linseed meal (30 to 32 percent protein)

"Old process" or "expeller" type linseed meal was considered by horse owners to be effective in blooming the hair coat. It contained a fatty acid

(linoleic) that may be deficient in standard horse rations. "New process" or "solvent" processing removes this fatty acid from linseed meal. Since linseed meal is not well balanced in amino acids, use of "solvent" process is hard to justify.

Fitters of show horses who use legume hay may find linseed meal too laxative in their programs.

Soybean meal (42 to 50 percent protein)

Soybean meal is a preferred supplement for horses. It is higher in protein, has a better balance of amino acids and is cheaper in the Midwest than other supplements.

Cottonseed meal (40 to 45 percent protein)

Cottonseed meal is used extensively for horses in the Southwest. It seldom costs less than soybean meal in the Midwest and is not as palatable; therefore, the extent of its use is limited. It does have more phosphorus than the other oil meals.

Commercial protein supplements

These vary in composition, protein level and price. They often contain needed minerals and vitamins and are convenient for those who do not wish to formulate their own horse rations. Some may be expensive. Commercial supplements are usually formulated for a specific feeding program; therefore, they should be fed according to directions.

Other protein supplements

Alfalfa meal, corn gluten meal, meat meals and others can be used with horses as protein supplements.

Pelleted feeds

Complete rations pelleted for horses are finding an eager market. They are convenient to transport and feed, and waste is held to a minimum. When pelleted feeds are purchased from a reliable source, horse owners can depend upon a good balance of nutrients. Pellets are especially useful for horses with heaves.

They usually are more expensive than hay and grain fed separately, and horses tend to eat bedding and chew wood more when fed pellets. Cribbing may result in some cases unless exercise lots are used, and some horses need an adjustment period before they eat pellets well.

Minerals

Major minerals (salt, calcium, phosphorus)

No other animal faces a critical need for salt like the working horse. He may lose as much as 75 grams daily through sweat and urine. For this reason, regardless of the type of ration fed, loose salt should be offered free-choice in a convenient place along with an abundance of clean water. Salt-starved horses should be brought to a full feed in a period of about one week. Salt intake should be about 2 to 3 ounces daily or 1 to 1-1/4 pounds weekly.

Skeleton and teeth represent about 5 percent of live weight and are composed largely of calcium and phosphorus. Milk is also high in these minerals. Therefore, pregnant or lactating mares and growing horses have high mineral requirements.

Mineral mixtures formulated from ground limestone, steamed bone meal, oyster shell, defluorinated phosphate, etc., are commonly used. They should be fed free-choice separate from the salt supply.

Trace minerals

Trace mineral needs of horses remain largely obscure because little research has been done. Strong, long-lived horses have been developed for years with good care and management, suggesting that most, if not all, trace minerals are supplied in a good feeding program. In light of present knowledge, iodine would seem to be an exception. It is best supplied in iodized salt.

Many horse owners feel extreme skeletal stress in young horses. Activities such as racing also increase the need for minerals. There is no doubt a mineral deficiency cannot be tolerated by such horses. Conversely, force feeding high levels of trace minerals is detrimental and may be toxic in some cases.

Vitamins

Less is known about vitamins than minerals, but supplementation is easy because they are cheap. With the exception of vitamin D, vitamins are tolerated at high levels. Substantial body storage of some vitamins is possible.

Horses with access to good pasture, if only for a brief time, and those receiving good quality hay, especially if half legume, will probably need no vitamin supplementation. Deficiencies are more likely to appear with horses in confinement for long periods of time on poor quality roughage.

The B vitamins are synthesized in the large colon and caecum of healthy horses. However, a need for thiamine in the diet has been demonstrated. A deficiency of riboflavin contributes to periodic ophthalmia (moon blindness). Common sources of B vitamins are green plants, dried legumes, soybean meal, etc.

Vitamin A is important for normal health of tissues, including eye and bone growth and maintenance. Green plants and hays contain carotene, which the body normally converts to vitamin A.

Vitamin D is essential for calcium and phosphorus deposition in bone formation. Animals exposed to sunlight usually synthesize sufficient vitamin D to meet their needs.

Vitamin E is abundant in most rations and seldom needs supplementation. Claims for its benefit in restoring fertility in horses have not been substantiated by research.

Establishments with horses confined for long periods should probably consider an economical commercial source of vitamins as insurance against deficiencies when the roughages are not of top quality. On the other hand, "stuffing" an animal with vitamins many times beyond its known requirement increases expenses and contributes nothing to its health.

Water

A source of fresh, clean drinking water is essential for horses at all times. Daily consumption may average 10 to 12 gallons, with much higher amounts consumed at hard work and/or in hot weather. When water is not available free-choice, idle animals should be taken to it at least twice daily at regular intervals. Impaction is a common and rather serious problem resulting from infrequent drinking. Hot horses should be cooled out or permitted small amounts of water before drinking their fill.

Working horses should be watered frequently whenever possible as it refreshes the animal and reduces heat exhaustion.

The best bred horse in the hands of a good trainer will fail unless supported by a good health and feeding program.

G2806, reviewed October 1993

Related MU Extension publications

- G2807, Feeding Horses
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G2807>
- G4515, Annual Lespedeza
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G4515>
- G4638, Red Clover
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G4638>
- G4639, White, Ladino and Sweet Clover
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G4639>
- G4669, Tall Fescue Toxicosis
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G4669>
- G4672, Smooth Bromegrass
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G4672>
- MX75, Alfalfa — The High Quality Hay for Horses
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=MX75>

Order publications online at <http://extension.missouri.edu/explore/shop/> or call toll-free 800-292-0969.



■ Issued in furtherance of the Cooperative Extension Work Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. Director, Cooperative Extension, University of Missouri, Columbia, MO 65211
■ an equal opportunity/ADA institution ■ 573-882-7216 ■ extension.missouri.edu