

# Pasturing *and* Feeding HORSES

**F**eeding is a very important consideration for a horse owner, both from the standpoint of meeting the nutritional requirements of the animals so they can perform and look their best and from the standpoint of minimizing expense. Many horse owners find that they need additional information regarding the usefulness of various feeds or how to best go about meeting the nutritional requirements of their animals. This publication explains important considerations involved in pasturing and feeding horses in Alabama.

## General Nutritional and Feeding Information

Like other farm animals, horses need specific levels of protein, carbohydrates, fats, minerals, vitamins, and water. For specific nutritional requirements for horses of various classes and weights, a publication such as “Nutritional Requirements of Horses, Sixth Revised Edition” from the National Research Council (2007) should be consulted.



# Protein

Protein is a costly ingredient, so when balancing a ration, only the required amounts should be provided. Pregnant mares, lactating mares, and growing foals require more protein than do mature geldings. Protein is needed to build tissue, for production of milk, for reproduction, and for certain other body functions. Some feeds are better suppliers of amino acids, the building blocks of protein, than others. The requirements of horses for protein are relatively low and are easy to meet with practical rations. The following are good sources of protein.

## *Cottonseed Meal (41% Crude Protein)*

Cottonseed meal is often used in horse rations in Alabama. It should be mixed with bulkier feeds and started at a low level (about ¼ pound per animal per day), then built up slowly to the desired level. It is high in phosphorus, so diets with high levels of cottonseed meal may need added calcium to keep these minerals in balance. In general, the calcium to phosphorus ratio of the total diet should be between 1:1 and 2:1.

## *Linseed Meal (32% Crude Protein)*

Linseed meal is excellent for producing “bloom” or luster in the hair coats and, therefore, it is held in high esteem by many horse showmen. Its laxative effect and palatability make it a useful protein supplement for poor quality roughages.

## *Peanut Meal (45% Crude Protein)*

Peanut meal is available in large quantities in Alabama. It is usually cheaper than other oil meals and is as palatable as cottonseed meal. It is not as well balanced in amino acids as soybean meal or linseed meal but can be used in horse rations.

## *Soybean Meal (44% Crude Protein)*

Soybean meal varies somewhat in protein content, but generally it can be used to replace linseed meal on an equal basis. It has an excellent amino acid profile for horses, and most commercial horse supplements contain soybean meal.

## *Commercial Protein Supplements*

These vary in composition and price. They often contain needed minerals and vitamins, making them convenient for people who do not wish to formulate their own rations. Commercial supplements are usually formulated for a specific feeding program and should be fed according to label directions.

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# Carbohydrates

Carbohydrates make up about three-fourths of the dry matter in most plants and are the most important sources of energy for farm animals. They are needed to provide energy for the muscular work of horses and are often the chief source of body fat. Generally, grains provide more energy than grasses or hays because they have higher levels of total digestible nutrients (TDN) and lower levels of crude fiber. The following grains and feeds are commonly used to furnish energy in horse rations.

## *Oats*

Oats have been accepted as the most desirable supplemental feed for horses, containing about 75 percent TDN, 13 percent crude protein (CP), and 12 percent fiber. This grain is highly palatable to horses and may be fed whole, but it is more digestible when rolled or crimped. Oats may be fed as the only grain with either legume or grass hay. However, a mixture of corn and oats with legume hay or a mixed grass-legume hay provides a more balanced ration.

## *Corn*

Corn is less bulky than oats and has a slightly lower protein content. Corn is probably used more widely than oats. Corn has approximately 85 percent TDN, 9.4 percent CP, and 2.5 percent fiber. It may be fed either shelled or on the cob. Either cracked or coarsely ground corn is suitable to feed to horses.

This processing may be needed to render some of the harder-seeded hybrids more digestible. Corn is commonly fed with oats, wheat bran, and a good quality grass or grass-legume hay mixture. Finely ground corn should not be fed unless mixed with some bulky feed, because it may cause colic and other digestive upsets. Corn can founder horses more easily than oats, because it contains about 15 percent more energy than the same volume of oats.

## *Grain Sorghum*

Grain sorghum (or milo) is slightly less fattening than corn for horses. Grain sorghum seed kernels are small and hard. They should be rolled or coarsely ground before being fed to horses. This grain should be fed with a bulky or slightly laxative feed. Milo can substitute for corn in horse diets on a pound-for-pound basis. Sorghum grain averages 83 percent TDN, 11.6 percent CP, and only 2.7 percent fiber.

## Barley

Barley is a good horse feed and is usually substituted for oats pound-for-pound, although it has about 10 percent greater feed value than oats. Barley has about 80 percent TDN, 12.4 percent CP, and only 6 percent fiber. Any change from oats to barley should be gradual and extended over about 2 weeks to allow the microorganisms in the horse's cecum and large intestine to adjust to the new grain. Because of the hardness of the barley kernel, it should be rolled (crushed or crimped) or ground (medium grind) before feeding. Because it is heavy, barley alone may cause colic. Mixed with bulkier feeds, it is quite safe.

## Wheat

Wheat is generally considered unsafe to feed as the sole concentrate for horses, because feeding excessive amounts may cause colic or other digestive upsets. Wheat grain should not comprise more than 20 percent of the concentrate in the ration. Wheat contains slightly less TDN than corn and 14.2 percent CP.

## Wheat Midds

Wheat midds are a by-product of the milling industry and are commonly used in pelleted horse feeds. They are higher in protein and fiber and lower in energy than wheat grain. Feeds containing appreciable amounts of wheat midds should not be stored for long periods of time. In Alabama where relative humidity is high, they will absorb moisture and be conducive to mold growth. Hence, feed should be purchased as needed. Wheat midds contain about 80 percent TDN and 15 percent CP.

## Wheat Bran

Wheat bran is the coarse outer coating of the wheat kernel that is removed during the milling process in the manufacturing of flour. It is rich in minerals, vitamins, and protein. Good wheat bran is flaky, sweet, and pleasant to the taste. Storage in damp places causes it to cake or mold and makes it unfit for horse feeding. Four qualities that make bran valuable in a ration are bulk, palatability, nutritive value, and mild laxative action. Wheat bran averages around 65 percent TDN, 17.3 percent CP, and 10 percent fiber. Rice bran may be fed in the same amounts as wheat bran

and has about the same TDN, although it is lower in protein and has less laxative effect. There seems to be little or no advantage in feeding bran as a wet mash. Both wheat and rice bran are high in phosphorus so diets containing large amounts of bran can lead to an imbalance in the calcium:phosphorus ratio if additional calcium is not provided.

## Molasses

Cane molasses increases the palatability of feed mixes. Undiluted molasses may be mixed with grain or diluted with one or more parts of water and sprinkled over the hay or grain. Cane molasses averages about 53 percent TDN with little or no protein and no fiber. It can be advantageously mixed with other concentrates up to about 10 percent of the ration. Careless feeding of molasses may result in the coating of feed troughs, mangers, or hair coats with the sticky fly-drawing liquid. Cane molasses mixed with other feeds will increase the moisture content of the mixture, thus increasing the possibility of mold if care is not observed in storage.

## Sugar Beet Pulp

Dried sugar beet pulp, available with and without added molasses, is a by-product of the sugar industry. It is often used in mixed concentrate feeds for horses and can be included in the diet as a source of energy and high quality fiber. When beet pulp is utilized in horse diets as a stand-alone ingredient, it is generally soaked in water for several hours prior to feeding. Beet pulp varies in TDN, but generally it is slightly below the value for oats. Beet pulp contains about 10 percent CP.

## Soybean Hulls

Soybean hulls (soyhulls) are a by-product of the soybean processing industry. They are the skin off of the soybean, and they are quite similar to oats in both TDN and CP content. When soyhulls are fed to horses, they should be in the pelleted form. Soyhull pellets are dry and relatively unpalatable, so they can cause choking and feed rejection. When used in horse rations, they should be mixed with a more palatable feed such as sweet feed and limited to 50 percent of the supplement.



# Fats

Fats furnish 2¼ times as much energy per pound as do carbohydrates. The important vitamins A, D, and E are soluble in fats and are absorbed from fat in the horse's digestive tract. Mature horses can tolerate diets containing up to 18 percent fat, but a ration with 8 to 10 percent fat is more acceptable. Most feed materials contain some level of fats, and it is normally not necessary to add additional fat when formulating diets for mature pleasure horses. However, hardworking horses, broodmares in peak lactation, and thin horses may benefit from added fat in their diet. Fat can be added to horse diets through a "fat pellet" produced by most horse feed manufacturers, stabilized rice bran or topdressing the horse's feed with vegetable oil. Take precautions in hot weather to keep the fat in a cool place to prevent rancidity problems.

# Minerals

The most important minerals needed by horses are calcium, phosphorus, and sodium. Calcium and phosphorus account for three-fourths of the mineral matter in a horse's skeleton and for more than half of the minerals in milk. Bone ash contains about 36 percent calcium, 17 percent phosphorus, and 0.8 percent magnesium. It also contains traces of sodium, chlorine, potassium, fluorine, and other mineral elements. To obtain proper calcium and phosphorus utilization, at least three conditions must be met. First, an adequate level of both calcium and phosphorus must be fed. Next, a suitable ratio between them must exist. Generally accepted ratios of calcium to phosphorus for most horses are in the range of 1 to 2 parts calcium to 1 part phosphorus. Avoid feeding less calcium than phosphorus if at all possible. Last, it is best to keep calcium and phosphorus levels as close to the requirements as possible.

## Ground Limestone

Feed-grade, ground limestone (about 34 percent calcium) is the most commonly used calcium supplement. It is generally cheap and readily available.

## Dicalcium Phosphate

Feed-grade dicalcium phosphate or monocalcium phosphate are generally used to provide additional phosphorus to horse diets when it is needed. They contain about 18 to 21 percent phosphorus and about 16 to 22 percent calcium.

## Steamed Bone Meal

Bone meal is another common phosphorus supplement for horses. It contains about 13 percent phosphorus, 27 percent calcium, and 18 percent crude protein.

## Salt

Salt can be provided loose or in a block and fed free choice. It can also be fed as a trace-mineral salt. Trace-mineral needs of horses remain largely obscure because of limited research. Most, if not all, trace minerals are supplied in a good feeding program, but iodine seems to be an exception. This element is best supplied in iodized salt. Forced feeding of high levels of trace minerals is detrimental and may be toxic.

Sodium from salt is very important to horse health. Horses that are relatively idle will need 1 to 2 ounces daily. A horse that sweats a great deal will need greater amounts. Hard-working horses may not get adequate amounts from a salt brick, so it needs to be included in the ration or offered in loose form.

# Vitamins

Less is known about vitamins than minerals, but supplementation is easy and inexpensive. With the exception of vitamin D, vitamins are tolerated in high levels. The three vitamins known to be most needed by horses are vitamins A, D, and certain B vitamins, such as thiamine. The need for vitamin E has been found to be important, especially for breeding animals. This vitamin is widely distributed in horse feeds.

The B vitamins are synthesized in the large colon and cecum of healthy horses. Common sources of B vitamins are green plants, dried legumes, and soybean meal.

Vitamin A is important for normal health of tissues, including the eye, and for 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.

Horses with access to good-quality pasture or that are receiving good-quality hay, especially if half or more is composed of legumes, will probably need no vitamin supplementation. Vitamin deficiencies are most likely

to appear in horses confined for long periods of time and fed poor-quality roughage. These horses should probably receive vitamin supplementation as insurance against deficiencies.

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## Water

Fresh, clean drinking water is essential for horses at all times. Daily consumption may average 10 to 12 gallons, with much higher amounts consumed during hot weather by working horses and by lactating mares. When water is not available free-choice, idle animals should be taken to it at least twice daily at regular intervals and allowed to drink their fill. Impacted bowel is a common, and serious, problem resulting from inadequate water intake. Hot horses should be cooled off and permitted small amounts of water before drinking their fill.

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## Hay for Horses

Good-quality hay will furnish most of the carbohydrates needed for energy in a maintenance diet for horses. Weedy hay, poorly fertilized hay, and late-cut hay must be supplemented to provide a balanced ration. Maturity of the forage crop when cut for hay is extremely important in determining hay quality. Legumes generally should be cut at prebloom or not later than early bloom; grasses should be cut just before heading or when only a few seed heads have emerged. The quality of forage decreases rapidly after the optimum stage is reached.

If hay has a bright green color, it probably will be a good source of vitamins, particularly vitamin A. In addition, having a good color is an indication that the hay has not been damaged by rains.

“Hay belly” is a term that refers to horses having an enlarged abdomen resulting from consumption of relatively large quantities of low-quality (mainly grass) hays. Hays of high quality do not produce this result.

Feeding moldy or dusty hays to horses can cause digestive disturbances. Dry, dusty hay can also cause irritation of the lungs, resulting in a cough, runny eyes or nose, and possibly pneumonia.

Legume hays are normally higher in protein, vitamin A, and minerals (especially calcium) than grass hays and are preferred by horses. Good-quality, leafy alfalfa hay is generally considered to be the most nutritious hay to feed horses, but it is not commonly grown in Alabama. Horses need a minimum of 1 pound of long roughage (hay or pasture) per 100 pounds of body weight daily. The only sure way to determine hay quality is to have it tested at a forage testing laboratory. Many labs charge about \$10 for a basic analysis that determines the TDN and protein content of the hay.

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## Pastures for Horses

Pasture is generally the least expensive way to meet the nutritional requirements of horses and offers the added advantage of providing them with exercise. Stocking rates vary with forage species, size of the horses to be pastured, and other factors. In Alabama, 1 to 2 acres of well-managed pasture per mature horse will provide adequate exercise while meeting most or all of the nutritional requirements of the animals.

Horses are naturally suited to grazing and, in general, have nutritional requirements similar to those of beef cattle. However, they cannot consume as much feed as beef cattle, so the quality of the material they consume needs to be better. Establishing good-quality pasture involves expense, but it will save money in the long run to develop good pastures that will provide a high percentage of horses' nutritional needs.

Horses vary greatly in their nutritional requirements. Mature horses and well-developed older yearlings can

normally be maintained on good pasture or good-quality hay with little or no grain supplementation. Young, growing horses, working horses, and show horses will require some grain and high-quality hay along with pasture.

Many forage crops can be grown in Alabama and most can provide grazing for horses. Forage crops are normally classified as being either grasses or legumes; either annuals or perennials; and either warm-season or cool-season plants.

# Warm-Season Perennial Grasses

Warm-season perennial grasses are widely used for horse pastures in Alabama. Forage quality of these grasses is usually adequate for maintenance of mature animals.

## Bermudagrass

Bermudagrass is a productive species best adapted to well-drained upland soils. Improved varieties must be established from vegetative material rather than from seed. Several vegetatively propagated hybrid bermudagrass varieties are recommended for use in Alabama. Common bermudagrass can be established from seed but produces a lower forage yield and must be stocked at a lower rate.

## Bahiagrass

Although a lower yielder than bermudagrass, bahiagrass is also suitable for horses. Like bermudagrass, it is best adapted to well-drained areas. It forms a thick, tight sod that is very resistant to trampling. The varieties Pensacola and Tifton 9 are recommended for the lower two-thirds of Alabama, while Argentine, a less cold-hardy variety, is recommended for the lower third of the state. A new variety, Sand Mountain, is suitable for the northern half of Alabama.

Bermudagrass and bahiagrass are often overseeded in the fall with mixtures of winter annuals. This is an excellent forage management practice because it can extend the grazing season of a pasture by 1 to 3 months and also can improve forage quality during the spring months.

## Dallisgrass

Dallisgrass is best adapted to soils having good internal moisture-holding capacity. Although Dallisgrass can be grown on selected sites in most of the northern half of Alabama, most of the acreage is on the Black Belt soils in central Alabama, to which it is particularly well adapted. Dallisgrass pastures can be improved by growing either white clover or red clover in association with the grass.

# Cool-Season Perennial Grasses

## Tall Fescue

By far the most widely grown cool-season perennial grass in Alabama, tall fescue is best suited to soils with good moisture-holding capacity or to low-lying moist sites. However, pregnant mares grazing pastures containing a high percentage of fescue are likely to abort, have a difficult foaling that results in stillborn foals, or have poor milk production. It is now known that this problem is caused by the fungus *Acremonium coenophialum*, which also causes fescue toxicity in cattle. Although undetectable except by laboratory analysis, this fungus is known to infest most existing fescue pastures. It is highly recommended that pregnant mares be removed from fescue pastures at least during the last 3 months of gestation, if the fescue is not known to be a fungus-free variety. The fungus is transmitted only through seed; therefore, fungus-free pastures can be obtained by using seed known to be fungus free when establishing new fescue pastures. Fescue containing a different (novel) fungus from *Acremonium coenophialum* has been shown to be safe to feed to pregnant mares.

## Orchardgrass

Orchardgrass produces forage of higher quality than fescue and is suited to be grown on well-drained, but not droughty, soils in approximately the northern third of Alabama. Orchardgrass makes an excellent horse pasture, but stands normally do not persist for more than about 3 years. Red clover or white clover can be grown in association with either fescue or orchardgrass.



# Warm-Season Annual Grasses

A number of warm-season annual grasses are grown in Alabama.

## Browntop Millet

Browntop millet is a good-quality grass that horses readily eat, but it is highly susceptible to drought and has a fairly short growing season.

## Pearl Millet

Pearl millet is a species adapted to well-drained or sandy soils and is much more productive than browntop millet. This forage crop provides relatively good nutrition for horses, but the animals may not graze it well until they become accustomed to the taste. Growth of pearl millet is erratic, making rotational grazing or frequent stocking rate adjustments necessary to maintain the forage in a palatable condition for horses.

*Sorghum, sudangrass, and particularly sorghum-sudangrass hybrids are not recommended for horse pastures.* Animals grazing these species may develop a problem called equine cystitis, which results in paralysis and urinary disorders. Hay of these species is safe to feed to horses.

## Crabgrass

Crabgrass is another summer annual grass that may provide grazing for horses. It is rarely seeded, but frequently volunteers along with summer perennial grasses such as bermudagrass or on land where winter annuals were planted on a prepared seedbed. Crabgrass is usually a relatively low yielder but is palatable and provides good-quality grazing for horses.

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# Warm-Season Perennial Legumes

## Alfalfa

Alfalfa requires good, fertile, well-drained land. It is necessary to exert a very high level of management to maintain alfalfa stands under grazing. Although grazing alfalfa is possible, it is not generally recommended as a practice in Alabama because grazing is likely to shorten stand life. However, growing alfalfa to produce hay for horses is a very attractive option for many Alabama producers.

## Sericea Lespedeza

A widely adapted warm-season perennial legume, sericea lespedeza is generally not considered to be a good species for horses as it is unpalatable. A variety release from Auburn University, AU Lotan, has small stems and low tannin levels that result in greatly increased digestibility and palatability. Sericea lespedeza is intolerant of close grazing and the “spot grazing” tendencies of horses make pasture management difficult. This forage crop is, therefore, probably best suited to provide hay, rather than pasture, for horses. Either high-tannin or low-tannin types make good horse hay.

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# Cool-Season Perennial Legumes

## White Clover

The most widely grown cool-season perennial legume in Alabama is white clover. This forage crop does best on heavier soils and is almost always grown in association with fescue, orchardgrass, or dallisgrass. White clover includes Ladino, or giant white clover types, as well as the intermediate or white dutch types. White clover is a high-quality legume species well suited to be used in horse pastures in areas to which it is adapted.

## Red Clover

A more upright growing plant than white clover, red clover is more competitive with grasses in areas that are not grazed closely, such as fields to be cut for hay. Red clover yields well, but it is a weak perennial that normally lives for only 2 years. It is usually grown in association with fescue or orchardgrass, but it may also be used as an annual in combination with winter annual grasses. A fungus infection of red clover can lead to excessive salivation (slobbering) in horses. If horses have access to adequate amounts of water, this condition is more a cosmetic problem than a health problem.

# Cool-Season Annual Grasses and Legumes

Cool-season annual grasses (rye, wheat, oats, and ryegrass) are usually grown together in mixtures or with cool-season annual legumes such as crimson clover. These species are adapted to well-drained, fertile soils and make excellent horse pastures. They may be planted either on a prepared seedbed or overseeded on the dormant sods of warm-season perennial grasses. Arrowleaf clover and hairy vetch are unpalatable to horses and will be rejected by them.

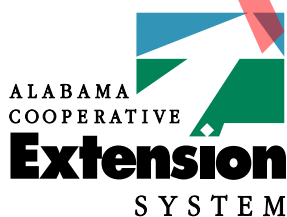
## Special Pasture Management Considerations

Horses are more selective in their grazing than cattle and tend to spot graze. This is particularly true if legumes are present in the pasture. Horses will eat legumes but tend to prefer to graze grasses. Therefore, horse pastures may require periodic clipping to even out the overgrazed and undergrazed areas and to keep forage plants throughout the pasture young and tender. However, if horse pastures are overstocked, the horses will not have the opportunity to selectively graze and their nutritional level will drop. It works well to graze horses and cattle together because the cattle will tend to provide this evening-out service. Also, horses and cattle will graze around each other's droppings, but not their own.

Pastures for horses should be well drained, safely fenced, free of holes or stumps that might cause injury to the animals, and contain no poisonous plants. Horses need access to shade, plenty of clean, fresh water, salt, and a basic mineral mixture. It is desirable to graze mature horses separately from yearlings. Horses do not normally bloat on pasture, but they may colic and founder on lush spring pastures if they are not gradually introduced to the pasture. Grazing time should be limited to one hour or less daily when horses are first introduced to a lush spring pasture, and grazing times can be gradually increased by one hour every three or four days until horses are completely maintained on the pasture. It is less likely for horses to founder on warm-season grasses because these grasses store sugar in a different form than the cool-season grasses. However, any dietary change with horses should be performed gradually.

The hooves of horses can be more damaging to pastures than those of cattle. Thus, rotational grazing is desirable, particularly in newly established horse pastures. It also may be necessary to protect a well-established pasture by temporarily removing the animals during wet periods when the ground is soft.

Parasites can become a problem when pastures are heavily overgrazed. Rotational grazing usually helps reduce pasture parasite problems, as does periodic dragging of pastures to scatter manure piles. Fresh horse manure should never be scattered on horse pastures that are to be grazed by horses within 2 weeks, because this can increase the horse's exposure to parasites.



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