Livestock & Pets - Feeding Time

Hay is the mainstay diet for our livestock. Learn the intricacies of hay types, nutritional content and quality before purchasing your next load.

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About the Author:

Heather Smith Thomas is based on her ranch in Salmon, Idaho, and has written many books on livestock, including *A Guide to Raising Horses: Breeding/Care/Facilities* (Storey Books), and *Storey's Guide to Raising Beef Cattle*.

During the cold winter months when pastures contain scant forage, hay is the typical diet for cattle, horses, sheep and goats. Next to pasture, good quality hay is the ideal feed. However, there are significant differences in the variety, quality and availability of hay, which can make feeding your livestock a time-consuming chore. But with some planning, feeding hay during the winter months can be a simple and efficient alternative while waiting the return of spring's lush pastures.

Hay falls into several categories: grass, legume, mixed (grass and legume) and cereal grain straw (such as oat hay). Some of the more common grass hays include timothy, brome, orchard grass and bluegrass. In some parts of the country fescue, reed canary grass, ryegrass and Sudan grass are common. In northern parts of the United States, timothy is widely grown because it tolerates cold weather and grows early in spring. It does not do well in hot climates, however. In central and southern parts of the country you are more apt to find coastal Bermuda grass, brome or orchard grass because these tolerate heat and humidity better.

Cereal grain crops (especially oats) can make good hay when cut while still green and growing, rather than waiting for the seed heads to mature for grain. There is always some risk of nitrate poisoning, however, if cereal grain hays are harvested after a spurt of growth following a drought period. If you are considering purchasing this type of hay, it can be tested for nitrate content.

Legumes used for hay include alfalfa, various types of clover (such as red, crimson, alsike and ladino), lespedeza, birdsfoot trefoil, vetch, soybean and cowpeas. Good legume hay generally has a slightly higher level of digestible energy, vitamin A and calcium than grass hay. Alfalfa may have twice the protein and three times the level of calcium than grass hay. Thus alfalfa is often fed to animals that need more protein and minerals.

NUTRITIONAL CONTENT

The nutritional value of hay is related to leaf content. The leaves of grass hay have more nutrients and are more digestible when the plant is immature and growing, and more fiber when the plant has reached full growth. Legume leaves, by contrast, do not have the same structural function and don't change much as the plant grows, but the stems become coarser and more fibrous.

Alfalfa stems, for example, are woody, serving as structural support for the plant. Leaf-to-stem ratio is the most important criterion in judging nutrient quality in an alfalfa plant. The digestibility, palatability and nutrient values are highest when the plant is young—with more leaves and less stems.

About 2¼3 of the energy and 3¼4 of the protein and other nutrients are in the leaves of a forage plant (whether grass or legume). Coarse, thick-stemmed hay (overly mature) has more fiber and less nutrition than immature, leafy hay with finer stems.

If buying alfalfa hay, you'll want to know if it is first, second or third cutting (or later), and at what stage of growth it was harvested. Although there are differences between cuttings, quality is most important. First-cut alfalfa can be stemmy, but only if it is too mature when harvested. However, weeds tend to appear in first-cut alfalfa hay. Second-cut alfalfa usually has a higher stem-to-leaf ratio but is lower in crude protein—about 16 percent on average. Third-cut alfalfa typically has a higher leaf-to-stem ratio because of slower growth during the

cool part of the season. If buying grass hay, maturity at harvest will also make a difference in its nutrient quality.

Early bloom alfalfa (cut before the blossoms open) has about 18 percent crude protein, compared with 9.8 percent for early bloom timothy (before seed heads fill), 11.4 percent for early bloom orchard grass, and lower levels for most other grasses. Alfalfa cut at full bloom drops to 15.5 percent crude protein, compared to 6.9 percent for late bloom timothy and 7.6 percent for late bloom orchard grass. Thus legume hay, cut early, is more apt to meet the protein and mineral needs of young growing, pregnant or lactating animals than will many of the grass hays.

Feeding Tips

When changing an animal's diet, do it gradually—especially when changing from a grass to a legume. Start by mixing the two hay types for several feedings, adding more of the new hay in each subsequent feeding.

The animals' digestive tracts must adjust to the different type of feed.

Changing to a legume hay suddenly can make an animal sick, or cause a ruminant animal to bloat. Changing from grass hay to alfalfa all at once can change the environment in the rumen of cattle, sheep and goats and in the cecum of a horse (because of the shift in pH—the acid/base balance).

This can disrupt the microbes that help the animals digest their feed.

HAY FOR HORSES

Horses can do well on grass or alfalfa (or other legume) hay. Important factors to keep in mind for horse hay are the nutritional needs of the animals (mature horses will not need high protein or calcium levels unless they are mares nursing foals), and the way the hay was harvested. If it was rained on after it was cut, baled too green or too wet or too dry, it may not be safe to feed. Hay for horses should never contain dust or mold, as it may lead to coughing and respiratory problems. Some types of mold may cause colic or can cause a pregnant mare to abort.

Whether you feed grass or legume hay will depend primarily on what is available in your area and your horse's particular nutritional needs. Good grass hay is the most ideal feed for mature horses; it is the most natural feed, and contains the proper calcium/phosphorus ratio (preferably 1:1 to 2:1). For pregnant or lactating mares, or young growing horses, some legume hay added to the diet provides the additional protein and higher levels of other nutrients needed. A mix of grass and legume hay often works well.

In some regions, it is hard to find good grass hay. If you must use alfalfa hay for all your horses, be selective in the hay you choose. You may need different qualities of hay for different horses—leafy hay for weanlings, for instance, and more mature hay for adult horses that do not need such fine hay. Particularly fine-stemmed, leafy alfalfa (rabbit hay or dairy hay) is too rich and palatable for horses (they generally overeat on it) and does not have enough fiber content for proper digestion. It is also the most costly alfalfa. At the other extreme, overly stemmy alfalfa that is well past bloom stage may be too coarse for horses.

In many geographic regions that get only two or three cuttings of alfalfa per season, first-cutting alfalfa might be the preferred hay for horses. It is less apt to contain blister beetles (which are deadly if eaten), and it often has a little grass mixed in. It also tends to have relatively coarse stems (supplying the fiber a horse needs for proper digestion) since it grows the fastest.

Later cuttings tend to grow more slowly and the stems are finer and softer. These cuttings are too rich (too many nutrients per pound, with very little fiber) for most horses, unless you are just adding a little bit of it to the diet of a young orphan foal or an older horse that has poor teeth and cannot chew stemmy hay.

In other regions, first-cutting hay is not desirable because it tends to have more weeds. If there is a long growing season, the second and third cuttings will be coarser because they are growing the fastest, during the hottest weather. The later cuttings will have the finest stems, growing more slowly during the cooler fall season. As a general rule of thumb, grass hay is best for horses—alfalfa or other legume hay can be an excellent feed to mix with grass hay for

animals that need more protein. Alfalfa is also a good winter feed because heat is created by digestion of protein, so a horse can keep warmer on a cold night.

HAY FOR CATTLE
Cattle can generally tolerate dustier hay than can horses, and can even eat a little mold without problems. However, some types of mold may cause abortion in pregnant cows. The quality of the hay you feed will also depend on whether you are feeding mature beef cattle, young calves or dairy cows. Mature beef cattle can get by on rather plain hay of any type but lactating cows will need adequate protein. Good palatable grass hay, cut while still green and growing, can be very adequate. However, if grass hay is coarse and dry (with little vitamin A or protein), you'll need to add some legume hay to the cattle's diet.

Young calves have tender mouths and cannot chew coarse hay very well—whether grass or alfalfa. They do best with fine, soft hay that's cut before bloom stage; it not only contains more nutrients, but is also much easier to eat.

Dairy cows need the best hay—with the most nutrients per pound—since they are producing more milk than a beef cow. Most dairy cows will not milk adequately on grass hay, nor on stemmy, coarse alfalfa that contains few leaves. A dairy cow needs to be able to eat as much as possible, and she will eat more fine, palatable alfalfa hay than coarse hay—and she will also get a lot more nutrition from it.

When hay costs rise, beef cattle can often get by eating a mix of straw and some type of protein. Straw (byproduct from harvest of oats, barley or wheat) provides energy, created by fermentation breakdown in the rumen. A small amount of alfalfa, or a commercial protein supplement, can provide the needed protein, minerals and vitamins. Always select good quality, clean straw when buying it for feed. Oat straw is the most palatable; cattle like it quite well. Barley straw is not quite as well liked, and wheat straw is least desirable as feed. If feeding cereal grain hay (cut while still green and growing, rather than at maturity, as straw), have it checked for nitrate levels to avoid nitrate poisoning. (Contact your local extension agent about testing.)

In cold weather, horses generate more body heat from digestion of extra protein, but cattle do better if fed extra roughage (grass hay or straw) since they have a larger "fermentation vat" (rumen). So during cold weather, you will want to feed your cattle more roughage, rather than more legume hay.

HAY FOR GOATS
Legume hays such as alfalfa, clover, vetch, soybean or lespedeza work very well for kids, as well as pregnant and lactating does. Mature goats do very well on a grass-legume mix and some grass hays, but generally do not eat coarse grass hay; having small mouths, goats do not like it. Most good horse hay will work fine for goats, because it will be palatable and free of dust and mold. If goats are fed coarse hay, they may eat the leaves but not the stems.

As browsers, goats eat a wide variety of plants when roaming free, and will eat some of the weeds and other undesirable plants that other animals will not. Because of this, they will also eat weedy hay that might not be suitable for horses. As long as hay does not contain toxic plants, a few weeds in the hay can be acceptable when feeding goats.

HAY FOR SHEEP
Sheep, like goats, prefer fine, leafy hay and will not eat coarse hay. Immature grass hay or leafy alfalfa is usually the best feed for sheep. Mature sheep can get by on good-quality grass hay, but lambs do better with a legume—harvested while still growing so that it has finer stems.

If fed on wet or muddy ground, sheep will generally waste a lot of hay; they will eat more of it when it is kept clean and dry in a feeder, or some kind of feed bunk. When fed on dry, well-sodded, snow covered or frozen ground, however, sheep will clean up fine hay better than cattle because of their smaller mouths and ability to pick up the leaves. Some farmers keep

sheep and cattle together when feeding hay, so the sheep can eat the finer leaves that cattle waste.

SELECTING HAY

Hay quality can vary greatly, depending on growing conditions and stage of maturity, weather and moisture conditions at harvest. Factors that can affect nutritional value include plant species in the hay, fertility of soil, harvesting methods (whether the hay was conditioned or crimped to dry faster and lose less leaves and nutrients during drying) and curing time.

One way to assess the maturity of alfalfa hay is the snap test. If a handful of hay bends easily in your hand, its fiber content is relatively low and it will be more digestible than if the stems snap like twigs.

The best way to check hay is to open a few bales and inspect it closely. Look at texture, maturity, color and leafiness. Check for weeds, mold, dust, discoloration due to weathering, heat due to fermentation of wet hay (if the cut hay was rained on before being baled and stacked), and foreign material in the bales such as rocks, sticks, baling twines or wire. If ingested, wire can cause "hardware" disease in cattle by perforating the gut and causing fatal peritonitis because they do not sort out foreign materials before eating.

Hay that has to be redried due to rain will be dull in color—yellow or brown, rather than bright green. But all hay tends to weather because the sun bleaches the outside of the bales. You often cannot tell the quality of the hay by just looking at the outside of a bale. Even if the outer edge of a bale has faded from sun exposure and rain, the inside should still be green.

Use your nose as well as your eyes. The smell of hay will give a clue to quality. It should smell good, not musty, sour or moldy. The flakes should separate easily from the bale and not be stuck together. Moldy hay, or hay that heated excessively after being baled, will usually be heavy, stuck together and dusty. Good hay will be uniformly green and sweet smelling, with no brown spots or moldy portions.

Unless you are buying directly out of the field after baling, try to buy hay that has been protected from weather by a tarp or hay shed. Rain can ruin baled hay by causing mold. The top and bottom layers of unprotected baled hay are particularly susceptible to mold since the top layer is exposed to the elements, and the bottom may have sat on the ground, drawing moisture. Wet hay not only weighs more, adding to the cost, but will likely be moldy.

STORING HAY

Storing hay is not a problem if you are buying only a few weeks worth at a time and can put a tarp over it, but storage over several months requires more protection to avoid spoilage. Regardless of storage time, you will need a way to keep it from getting wet or drawing moisture from the ground. A hay shed is ideal because you can build up the floor with gravel for good drainage so the entire haystack is kept dry.

If you don't have any type of roof to put your hay under, you can create a well-drained area (by building up the floor with gravel or wooden pallets) and cover the stack with tarps. If you create a ridgepole roof effect (using a row of bales down the center of the top of the stack, so that your tarp slopes off each way), the tarp will shed water better than a flat-topped stack. Also, you will be less apt to have spoilage from a leak in the tarp if the water can run off readily.

If you have a year's worth of hay stored, keep in mind that long storage time reduces nutritional levels of protein and vitamin A. Always buy hay that was harvested under good conditions, then keep it dry and out of the sunlight so it will keep better. Always stack it so that the oldest bales will be used first.