The horse is designed to consume mainly forage (pasture and hay). When grazing is limited or not possible, hay becomes the major part of the diet. Therefore, choosing the right hay is important. Selecting hay for horses involves assessing both physical and chemical characteristics of the hay to best meet the nutrient needs of the horse.

Classification of forages

Forages are classified into 2 major categories: legumes and grasses. Legumes are typically higher in digestible calories, protein and vitamins than grasses. Additionally, legumes tend to have high calcium and low phosphorus concentrations; therefore, the calcium (Ca) to phosphorus (P) ratio must be given particular attention. Ideally, equine diets should have a Ca:P ratio range of 1:1 to 4:1. Hays with a Ca:P ratio outside the ideal range may be fed as long as the other parts of the diet modify the ratio back within the ideal range (see example in sidebar).

Common grass hays for horses include bermudagrass, bluegrass, brome, fescue, orchardgrass and timothy. Common legume hays for horses include alfalfa and red clover.

Visual evaluation

Regardless of the type of forage, several physical characteristics can be useful in determining hay quality. These include maturity, leafiness, color, smell, and presence of foreign matter.

The stage of maturity at harvest will affect the nutritive value of hay (figure 1). The maturity of hay can be estimated by the size of seedheads in grasses and the amount of flowers in legumes. Smaller seedheads and fewer flowers indicate less mature hay, which usually means increased nutrient concentrations. Related to maturity is the amount of leafiness. Leaves contain more protein and digestible calories than stems. Hay should have fine stems and lots of leaves. Forages with thick, woody stems and few leaves are very mature, difficult to digest and have a low nutrient content. Additionally, more mature forages are often less palatable to the horse, resulting in greater wastage.

| Example calculations: |
|---|---|
| **Hay:** | **Feed** |
| Ca: 1.33%, P: 0.19% | Ca: 0.90%, P: 0.65% |
| Ca:P ratio = 7:1 | Ca:P = 1.4:1 |

<table>
<thead>
<tr>
<th>Total Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the horse is fed 15 pound of hay and 6 pounds of feed, then the Ca:P ratio would be as follows:</td>
</tr>
<tr>
<td>Amount of Ca: [1.33 ÷ 100 x 15 lb.] + [0.90 ÷ 100 x 6 lb.] = 0.25 lb. Ca</td>
</tr>
<tr>
<td>Amount of P: [0.19 ÷ 100 x 15 lb.] + [0.65 ÷ 100 x 6 lb.] = 0.07 lb. P</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ratio calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25 lb. Ca ÷ 0.07 lb. P = 3.6</td>
</tr>
<tr>
<td>Ca:P of diet = 3.6:1</td>
</tr>
</tbody>
</table>
Hay should be green, as a beige or brown color generally indicates sun bleaching, age and loss of nutrients. Prolonged exposure to sunlight or moisture (rain, dew) will decrease the hay’s nutrient content. Nevertheless, a green color can be deceiving, as dried weeds are often bright green. Distinguishing between green weeds and the desired forage is essential in determining quality. One notable exception to this rule is red clover hay, which often appears brown regardless of quality.

Hay should smell sweet and clean. An opened bale should show no evidence of dust, mold or insect infestation. Occasionally, mold in hay is not visible to the naked eye (e.g., “fuzzy” growth will not be apparent on leaves and stems). Instead, the only evidence of dust or mold may be a “cloud” of particles when the bale is opened. Hay contaminated with dust, mold or other foreign matter is not acceptable for feeding horses. Dusty and/or moldy hay can result in respiratory problems and possible digestive upset (e.g., colic). Foreign matter, such as trash (wire and paper) and insects can prove harmful as well. For example, alfalfa hay can be infested with the alfalfa weevil or blister beetle, which can be fatal to horses.

Nutrient content of hays

While certain generalities can be drawn from the classification of hay (legume versus grass) and its appearance, the only method to determine the actual nutrient content of hay is a chemical analysis. Analytical results only apply to the sample taken; therefore the sample must be representative of the entire hay lot. Hay samples may be obtained by a nutritionist, local feed supplier or county extension agent. (Note: If a hay corer is unavailable, a representative grab sample from various square bales, different areas of round bales or a couple of flakes from different bales within the lot will suffice.) The sample should be sent to a reputable forage analysis laboratory. A typical hay analysis will provide the following nutrient concentrations: crude protein, acid detergent fiber, neutral detergent fiber, calcium, phosphorus, and often other minerals (e.g., copper, iron, manganese, zinc).

From greatest to least, the crude protein (CP) concentrations of hays are as follows: legumes > mixed > grasses. Additionally CP can give some clue as to the maturity of the hay, as a more mature hay will have lower CP concentration (figure 2). Acid detergent fiber (ADF) is an approximation of the indigestible fiber portion. A high quality hay sample will have a low ADF value. Neutral detergent fiber (NDF) is an approximation of both the indigestible and digestible fiber portions. As discussed earlier, particular attention must be given to the Ca:P ratio as well as the concentrations of the other minerals so that the entire diet can be balanced. An equine nutritionist can review the results and make feeding recommendations to best meet the horse’s nutrient requirements.

Hay form

Another consideration is the form of the hay: loose, baled (round or square), chopped, or cubed. Loose hay is rarely seen due to the inconvenience of storage. Baled hay is most common, and consideration must be given to the size of the bales and amount of labor needed to move them. Most hay is available in either square bales (40 to 150 lbs.) or round bales (1,000 to 2,000 lbs.). Wastage from square bales is often less than that of round bales. However, because round bales are often stored outdoors and/or placed in the field to allow horses free-access, the labor and facility requirements may be less. Unfortunately, outdoor storage/feeding also exposes round bales to rain and other precipitation, which may cause the hay to mold if it is not consumed quickly. In addition, round bales also pose a higher risk for botulism. To be on the safe side, round bales should be stored under cover and completely consumed within 3 to 4 days.
Hay may also be chopped or compressed into hay cubes and sold in bags. Because of commercial processing, these hay forms are often more consistent and free of contaminants. Additionally, feeding chopped or cubed hay reduces wastage and requires less storage area. One potential drawback is that chopped or cubed hay is usually consumed more quickly than typical long stem hay. As a result, a confined horse may become bored and develop vices (e.g., wood chewing, cribbing, etc.). The higher cost of cubed and chopped hay products should be weighed against the improved utilization and convenience.

Choosing a hay
When grazing is not possible, hay is best fed free-choice. On average, mature horses fed a forage-only diet will consume 2 to 4% of their body weight per day. For a 1,000 pound horse, this equates to 20 to 40 pounds of hay per day.

Mature horses that are idle or in light work have relatively low nutrient requirements in terms of crude protein and digestible energy. Oftentimes, these horses are able to maintain a healthy body condition on grass hay alone.

Growing horses, mares in late gestation or lactating mares have high nutritional demands. A mixed hay containing both legume and grass usually provides adequate protein and energy and a balanced Ca:P ratio. A mixed hay would also benefit “hard keepers” and working horses because of the higher digestible calorie content as compared to a grass hay.

Balancing the hay
When the horse is unable to maintain a healthy body condition and/or normally perform physiological functions on hay alone, then feed (grain) or supplements become necessary. Feed or supplements should be fed to balance the horse’s requirements for energy, protein, vitamins and minerals.

For horses that are able to maintain a healthy body condition on hay alone, vitamin and mineral support is still vital. Most hays grown in North America are deficient in some trace minerals and vitamins, and a typical trace mineral salt block will not meet the horse’s mineral requirements. Daily feeding of vitamins and minerals is essential to ensure optimal health and ensures intake to satisfy requirements. (Note: Horses cannot determine when they are experiencing a nutritional deficiency in any nutrient, including vitamins and minerals. Likewise, they cannot determine at what rate they should consume a particular vitamin or mineral to satisfy their requirement. Therefore, feeding free-choice vitamins and minerals is unwise.)

Summary
- Visual assessment and classification of hay gives some indication as to quality. However, this is not reliable in determining the true quality and nutritional value of the hay.
- Chemical analysis of the hay will show the true quality and nutritional value, but is an added expense. Chemical analysis is worthwhile when a significant supply of hay is available (e.g., several months to a year’s supply) or if knowing the nutrient profile is essential (e.g., for growing horses; horses with nutritionally challenging conditions: laminitis, Cushing’s disease, PSSM, etc.).
- Form of hay should also be considered. From least wastage to greatest: hay cubes and chopped hay < square bales < round bales. Cost, consistency and storage requirements must also be considered.
- The horse’s diet should always be forage based and feeds or supplements added to satisfy nutritional requirements.

[Images of Alfalfa and Orchardgrass]
Let Us Introduce You To
Maryland Feed Company

Nestled in the heart of Maryland’s horse country, the Maryland Feed Company provides the world’s greatest horse feed to its customers. This region has many diverse disciplines, including steeplechasing, fox hunting, hunters, jumpers, dressage and three-day events just to name a few. They are located 10 minutes north of the Midlantic Fasig–Tipton sales pavilion and 20 minutes north of Pimlico Racetrack, home of the Preakness, the second leg of the Triple Crown.

The owners of the Maryland Feed Company, J.B. and Michelle Jennings, take pride in their company and want to provide their customers with best products possible. When McCauley Brothers was looking to expand their company into the Maryland region, J.B. and Michelle decided without hesitation that McCauley’s feeds were right for their customers. McCauley’s products have quickly gained the respect of the Maryland Feed Company customers, including Jack Fisher, NSA 2004 Trainer of the year. Other customers include the Maryland Stallion Station, who stands the region’s premier Thoroughbred stallions, and Caves Farm, a top hunter/jumper facility. Another farm that Maryland Feed Company is proud to service is Rigbie Farm in Darlington, Maryland, which covers many aspects of the equine industry.

The philosophy at the Maryland Feed Company is that customers are treated like family. Whether delivering feed in the middle of Maryland’s worst blizzard on record or dropping feed off on the way home from work because a customer accidentally ran out of feed, the Maryland Feed Company always puts its customers first. If you are looking for a feed company that provides the world’s best feed and excellent customer service or you happen to be in Maryland for a few days, look no further than the Maryland Feed Company.

McCauley Hay Cubes

The Advantages of McCauley Hay Cubes

Less loss than loose hay. While baled or chopped hay results in a large amount of loss, hay cubes result in very little loss. Up to 30% of baled hay can be lost when feeding, while less than 1% of hay cubes will be lost.

Certified weed-seed free. McCauley bagged hay cubes are certified weed-seed free, meaning fields have been inspected prior to harvest and have met all criteria for certification. This hay may be fed on any state or federal ground, including national parks.

Easy to chew. McCauley cubes are designed for the horse. No “binder” added, resulting in a softer, safer cube.

Good source of roughage and protein. The hay grown for McCauley hay cubes is high in protein and harvested at a stage for maximum digestibility.

Easy to handle. The use of McCauley hay cubes allows for quick feeding with little manual labor (approximately an 80% reduction in labor costs). Rather than handling small bales manually or requiring specialized equipment for large bales, hay cubes are easy to distribute and reduce the risk of injury.

No mold or dust. Given the dry climate and care used in production, McCauley hay cubes are essentially mold free. Also, using cubes reduces the amount of dust associated with feeding and the resulting respiratory problems.

No twine or baling wire. Eliminates the risk of these materials becoming a hazard to animals and farm equipment.

Easy to store. Due to increased density over other forms of hay (cubes weigh 30 to 40 pounds per cubic foot), required storage space is dramatically reduced.

Cost effective. Given the reduced labor for handling hay cubes and the reduced loss, feeding McCauley hay cubes makes economic sense. Dollar for dollar, McCauley cubes are the most cost-effective forage feed you can buy.

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