Forage for Horses: But the Horse Isn't Really the Customer!

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Forage for horses: But the horse isn’t really the customer!
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Horses are natural grass eaters. Their mouth structure and digestive anatomy allow horses to successfully use forages as a primary source of nutrition and as an important part of normal digestive system function. This requirement for forages is most easily supplied by pasture and hay.

Mature horses will generally consume 2 to 2.5 percent of their body weight in feed each day. Ideally, horses should consume 1 percent or more (as dry matter) of their body weight daily as hay or pastures. Forages can provide varying amounts of the nutrient requirements depending on the forage quality and amount consumed. The remainder of the daily diet needs for a particular class, or production stage of horse is often provided in supplemental concentrates, minerals and vitamins.

Mature horses performing minimal or no work can be maintained on high quality forages without supplementing their diet with grain. However, growing, breeding, or working horses require supplementing the forage with a grain or concentrate to meet their additional nutrient requirements. As a general rule, forages should supply one half or more of the total weight of the feed consumed daily for optimum horse growth and development.

Forage nutritive quality
‘Horse hay’ is interpreted in many different ways. The interpretation varies greatly. Quality assessment and ‘adequacy’ can be based on tested nutritive value, visual traits, the forage type composition, or price.

Quality can be too low! The anatomy of the horse’s digestive tract has a ‘volume limit’ restricted by the effective digestion and utilization of low quality forages that are high in fiber. The poor digestion of low-quality forages can restrict the amount of dry matter that a horse can eat to a level below what is necessary to meet the horses nutrient needs. Therefore a premium should be placed on using high-quality forages in the horse’s diet.

Forage testing is recommended to first determine the nutrient profile of the forage fraction of the diet. Once the forage contribution is known, a concentrate and mineral ration can be formulated to properly balance the diet to meet the nutrient requirements.

Winter feed
High quality hay is the most important winter feed for horses. Hay furnishes energy, protein and bulk. Mature, idle horses can get along on good hay and mineral supplement alone. Supplementing with grain may be necessary if hay quality is low. Growth, work and reproduction may also require that rations include grain supplementation.

Iowa hay can range from all legume, such as alfalfa, to all grass, with all proportions of legume-grass mixtures between. With a sound ration formulation, nearly any medium to high quality hay is
suitable. The following are suggested for providing good yields of quality hay for horses.

**Alfalfa and alfalfa/grass mixed hay**

Pure alfalfa hay is favored by some horse owners. When harvested and stored properly, it can be the highest nutritive value hay source. Pure alfalfa hay will not harm horses, but it may be slightly laxative and cause more frequent urination. Producing or buying good quality hay with a mixture of alfalfa and a grass or grasses should reduce these minor physiological concerns.

Probably more popular among horse owners is legume-grass forage mixtures. Alfalfa can be combined with smooth bromegrass, and orchardgrass or timothy. This hay mixture is well suited to the Iowa climate and, with careful management, will remain productive for 3 to 5 years. An additional advantage of this mixture is its uniformity of production during the growing season. Season-long growth provides an option for one or two hay harvests early in the season and grazing later when many grass pastures are less productive.

**Clover and mixed clover/grass hay**

Red clover or alsike clover with orchardgrass or timothy can also be used for horse hay. An advantage of the clovers is that they will grow on wetter, lower fertility sites than will alfalfa, but generally have shorter stand life and lower yields than alfalfa/grass mixtures. Clover-based hay mixtures are slightly later in maturity than alfalfa and may fit better within other cropping operations on the farm. Horse owners should be aware that red clover hay can be dusty, which may be a concern. A greater concern among horse owners are problems associated with feeding moldy clover hay. Moldy hay can cause colic and irritation to the eyes, nose or lungs. A condition causing excessive salivation can occur under some circumstances when feeding moldy clover-based hay.

**Grass hay**

Grass hay such as smooth bromegrass, orchardgrass or timothy can be used for mature horses. Reed canarygrass can also be used for hay but is often of lower quality and palatability – particularly the first cutting - than smooth bromegrass, orchardgrass or timothy.

Tall fescue has a lot of desirable features as a pasture grass - adaptation to a wide variety of sites, good sod strength and a very long seasonal growth. However, much of the tall fescue in Iowa is contains a fungal endophyte that produces alkaloids that may limit palatability and digestibility, and can be very detrimental to horse reproductive efficiency. If tall fescue is to be considered, choose endophyte free varieties.

**Planting a new hay meadow**

Seeding and establishment methods are outlined in ISU Extension publication Pm-1008, *Steps to Establish and Maintain Legume-Grass Pastures* (and hay meadows). Information about legume and grass species alternatives can be found in ISU Extension publication Pm-1792, *Selecting Forage Species*. Here are some establishment points to remember. Alfalfa and alfalfa-grass mixtures are often planted in early spring with an oat companion crop. The oats can be grazed, cut for hay, or harvested for grain and straw. Hay meadows can also be planted between August 15 and very
early September. There is a greater risk of poor establishment from late summer seedlings due to the unpredictability of autumn rainfall. A companion crop of oats is generally not used with late summer seedings unless a severe erosion hazard exists.

It is best to fertilize hay meadows with phosphorus (P) and potassium (K) according to a soil test taken throughout the field. Apply at least 30 lbs/A P$_2$O$_5$ and 80 lbs/A K$_2$O at seeding time, during seedbed preparation. If the soil tests low in phosphorus, increase the P$_2$O$_5$ to 40 lbs/A; if the test is very low, increase to 50 lbs/A.

Don't over use or abuse a new meadow (or pasture) in the establishment year. Use management that encourages development and growth of the forage seedlings. Removing an oat companion crop early as a hay crop, or with a quick, light grazing, will aid the establishment of the forage seedlings. A modest late summer hay harvest or light grazing is often available in the seeding year. Avoid close or continuous grazing during the seeding year. And, be sure to allow the seedling plants to have a 6 to 8 week 'fall rest' from early September on, to gain vigor and to develop winterhardiness.

**Managing established hay meadows**

After the seeding year, alfalfa and legume-dominant meadows should be fertilized annually, preferably immediately after the first harvest, with about 50 lbs/A of P$_2$O$_5$ and 180 to 200 lbs/A of K$_2$O. Higher rates may be necessary if soil tests are in the low or very low range or where 5 or more tons of hay are being harvested annually.

Expect at least three cuttings from established alfalfa-grass meadows. Yields will range from 3.5 to 6+ tons per acre. Make the first harvest at first flower; this usually occurs in late May or early June. The second and third harvests can be taken at 35 to 45 day intervals, again at about first flower stage of development. Try to time the last summer cut for late August. Cutting at earlier stages of development will produce higher nutritive value hay with finer stems, but often at the sacrifice of total yield harvested and stand longevity. Coarse stemmed, low feed value hay usually results when meadows are cut later at mid- to late-bloom stages of maturity.

Alfalfa and alfalfa-grass hay meadows should be 'rested' from early September through mid-October each year to provide for the build-up of winter food reserves in the plant roots and crowns. These reserves are necessary for winter survival and strong plants for the following year. If growth is adequate after the fall rest period, a fourth hay harvest or grazing is often possible in mid- to late October.

Grass-dominant hay meadows should be fertilized each year with nitrogen to be productive. Apply 60 to 80 lbs/A of nitrogen in early spring and a second 60 lbs/A after the first harvest. Also, apply, annually 40 lbs/A of P$_2$O$_5$ and 80 lbs/A of K$_2$O in early spring or after the first harvest. Grass hay yields often range from 2 to 4 tons per acre.

To insure adequate protein content and favorable digestibility, the first harvest of established grass hay meadows should be when the grass has reached the 'late-boot' stage of maturity. The 'boot' stage can be recognized as the time at which the emerging seedhead is just beginning to be visible at the top of the grass plant. In Iowa, this occurs in late May for smooth bromegrass, orchardgrass, reed canarygrass and tall fescue, and early- to mid-June for timothy. If cut at later stages of maturity, forage nutritive value is lower and the hay has more and coarser stems. Second and third harvests of grass
hay can usually be taken at about 45-day intervals, but usually yield less than the first harvest.

**Buying hay for horses**

For horse owners not directly involved in producing their own hay, it is important that they become a feed value conscious consumer. Whether alfalfa, grass or mixed hay are preferred, look for hay that was harvested at an early stage of maturity. For legumes, that is when the individual legume plants are still leafy, and before a lot of open bloom is observed. For grasses, that is when there is a high proportion of grass leaves with few fully developed stems or seedheads. Look for leafiness in the bales and whether the leaves are still attached to the stems. If legume-based hay is very dry, or was baled very dry, leaf shatter and feeding waste may be excessive. Very dry hay will also be brittle and less palatable. Avoid any dusty, musty or moldy smelling hay. Ask the seller to open a bale or two for you to make closer observation of maturity, leafiness, and evidence of mold, weeds or other undesirable foreign material. Good green color usually goes along with good nutritive quality hay but don't buy only on the basis of color. If unsure about a particular lot of hay, but are interested, ask the seller to let you feed a few bales first. Most sellers will usually not object. A local seller who wants repeat business may even encourage it. They want buyers to be satisfied with the product. Local market conditions may vary, but, it is often more economical for the buyer to buy hay on a ‘price per ton’ rather than on a ‘price per bale’ basis.

**Pasture for horses**

Pasture is an ideal feed for horses because it provides both nutrients and an opportunity for exercise. Permanent pastures are usually best because of less work and cost. Pastures can be all grass or contain mixtures of grass and legumes. Planning and management are important to provide efficient production and a full season of grazing. One to two acres per mature horse, along with good management, including weed control, fertilization, controlled grazing and clipping will insure a full season of nutritious grazing.

Pasture species vary in their characteristics and suitability for pasture management programs. Here are a few of the more useful forage species for Iowa conditions.

*Kentucky bluegrass* has earned its reputation among horse producers for producing strong turf and nutritious forage. Bluegrass is most productive in May and June and again in September and October. Its primary problem is that it grows slowly during the hot, dry part of mid-summer. Including a legume such as alfalfa, red or white clover, or birdsfoot trefoil in a bluegrass pasture will improve productivity during the summer months.

Tall growing grasses such as *smooth bromegrass, orchardgrass and timothy* make excellent pasture and are more productive than bluegrass. Of the three, orchardgrass maintains a slightly better distribution of growth through the summer months. Reed canarygrass is sometimes used for horse pasture. However, it is considered less palatable than bromegrass, orchardgrass or timothy. Reed canarygrass may be the only good choice on wet sites and where flooding occurs. Reed canarygrass remains more palatable when clipping or grazing maintains the pasture height at about 5 to 6 inches.

*Tall fescue* has a lot of desirable features as a pasture grass - adaptation to a wide variety sites, good sod strength and a very long seasonal growth. However, much of the tall fescue in Iowa contains a fungal endophyte that produces alkaloids that may limit palatability and digestibility, and can be very detrimental to horse reproductive efficiency. If tall fescue is to be considered,
choose endophyte free varieties.

While perennial ryegrass and annual ryegrass are important pasture grasses in other parts of the world, they have been very inconsistent for Iowa producers. They have strong summer slump tendencies, and frequently winterkill the first winter after seeding. I think that a low proportion of ryegrass could be useful in a pasture mixture (<30%); it will provide some quick cover and forage production, but you don’t want an excessive amount of stand thinning due to winterkill. New varieties of ryegrasses are being marketed all of the time, hopefully, the degree of cold hardiness will improve and the ryegrasses can become a more useful component for Iowa producers. An added caution. ‘Turf-type’ ryegrass varieties developed for the turf industry often have endophyte fungi and alkaloid concerns as with tall fescue. Select and use only ‘forage-type’ varieties of ryegrass.

Mixing legumes with grasses often improves productivity, nutritive quality and distribution of forage production compared with all grass pastures. Birdsfoot trefoil and Ladino white clover are most compatible with bluegrass, orchardgrass and timothy. In mixture, these forages will maintain reasonably good productivity under a ‘frequent but not close’ grazing program, or, are better suited to a situation where there are few pastures and continuous grazing is used. If this latter situation is what you have, fewer animals on the limited acreage are suggested to prevent overgrazing and loss of the legume component.

**Alfalfa** and **red clover** are most compatible with bromegrass and reed canarygrass or mixtures of these with orchardgrass. In mixture, these taller growing legumes and grasses will maintain good levels of productivity under a ‘close but not frequent’ grazing program and are better suited to a 3 or 4 pasture rotational grazing program. Remember! Legumes maintain vigor and longevity best if given a 4 to 6 week ‘rest’ in September and early October each year.

Cereal grains such as **oats**, **wheat** and **winter rye** are sometimes used as annual or emergency pasture. Rye is available for grazing in late autumn and spring. Wheat can be grazed in the spring. Oats is best for late spring and/or early summer grazing. The green, leafy growth of these grains provides satisfactory feed value but should only be considered as temporary or short season grazing options.

**Sudangrass** and **Sudan-sorghum hybrids** are NOT recommended for horse pasture. These plants have caused an increasing number of cases termed “cystitis syndrome” in horses.

Harvested corn fields are a frequent pasture for horses in Iowa. Although horses can glean valuable feed from corn harvest residue, the nutritive quality is low after the dropped ears have been consumed. To provide extra energy, supplemental protein and mineral must be considered.

**Grazing and pasture management**

Good grazing management involves keeping both the animals and the pasture plants growing and healthy. It’s a three-component system: the plants, the animals, and the decision-maker/manager. Certainly providing palatable, highly digestible forage for the entire grazing season is ideal for the animal component of grazing management. The pasture plants, whether grasses or legumes, remain most productive when they are well fertilized and can maintain several inches of growth throughout the grazing season. The manager controls the system!

Overgrazing is an important hazard to pasture production. Horses are selective grazers and nip
plants very short when grazing. This kind of grazing will retard the further growth of the pasture plants. If continuous close grazing is practiced, legumes can be completely lost from the mixture and the weakened grass sod will allow weeds to establish in the pasture. When pastures become short, it is best to move the animals to another pasture. It is good management to have at least two separate pastures for each group of horses you are managing. Three or four pastures per group are better and allow greater flexibility in grazing management. If other pastures are not available, move horses to exercise lots and feed hay for two to three weeks until pastures recover.

Kentucky bluegrass-based pastures should be allowed to reach about 4 to 5 inches of height before grazing for the first time in the spring, then graze back to 2 to 3 inches. Allow regrowth to reach 3 to 4 inches before grazing again. Taller, more productive grasses, such as smooth bromegrass, or orchardgrass should reach about 4 to 5 inches before grazing for the first time in the spring. Graze back to 3 to 4 inches. Then allow a few inches of regrowth before grazing again.

Pasture quality can be improved during the season by clipping to remove uneaten clumps, unpalatable growth and weeds. Scattering the droppings also encourages more uniform grazing.

Fertilize grass pastures according to soil tests. Generally if grass pastures are medium or higher in phosphorus and potassium, no additional P or K are needed. If the soil tests low or very low, apply 30 to 40 lbs/A each or P₂O₅ and K₂O annually and retest in three years. For legume-grass pastures apply annual P and K applications when soil test levels are in the medium or lower category. Grass-based pastures are much more productive when fertilized with nitrogen. Greatest efficiency of nitrogen use comes when a portion is applied in early spring and a portion in late summer. Fertilize Kentucky bluegrass-based pastures with 40 to 80 lbs/A of nitrogen in the spring and an optional 30 to 50 lbs/A in late summer. Taller grasses such as smooth bromegrass or orchardgrass will respond well to 60 to 100 lbs/A of nitrogen in the spring and an additional 40 to 60 lbs/A in late summer. If mixed grass-legume pastures are less than 1/3 legume, treat as a grass pasture and apply nitrogen for increased productivity. Legume dominant pastures generally need no additional nitrogen. For more details see ISU Extension Publication Pm-869, Fertilizing Pastures.

Weeds can become troublesome in pastures. Clipping several times a year and hand digging may be sufficient. However, if low-growing broadleaf weeds become a problem, a herbicide application may be required. Where herbicides are necessary for weed control expect to see a decline or loss in legume plants. Applying 1 pound of active ingredient 2,4-D in the spring when weeds are 3 to 4 inches tall will often be effective in controlling annual broadleaf weeds. A second application in mid-autumn (mid-September through mid-October) may be necessary where dandelions and biennial thistles are a problem. Repeat these twice-annual applications until weeds are under control. After that only an occasional spraying or clipping may be all that is necessary for continued control. Perennial weeds and brush offer greater challenges. See ISU Extension recommendations for weed control in pastures, for more details on weed and brush control in pastures. Remember to read and follow label instructions for any pesticide or ag chemical used.

Additional information about pasture establishment and renovation can be obtained from ISU Extension publications Pm-1008, Steps to Establish and Maintain Legume-Grass Pastures, and Pm-1097, Interseeding and No-Till Pasture Renovation. Also refer to ISU Extension Bulletin, AG 81, titled Guide to Year-Round Forage Supply for a useful worksheet for evaluating forage programs or in planning improved forage management programs.