



Hay Quality: The Great Variable in Livestock Feeding Programs

By Jackie Nix

Now is the time to start thinking about hay supplies for the winter. Hay accounts for the majority of winter feed for cattle, horses, goats and sheep and yet varies the most in nutritional content among feedstuffs. An average cow or horse (1000 lbs) will require 2700 lbs of hay over a 90-day feeding period. That translates into roughly 54 square bales (ave. 50 lb) or 5 1/2 round bales (ave. 500 lbs). An average goat or sheep will require 490 lbs of hay during this same 90-day period (~10 square bales or 1 round bale). Knowledge of the quality of your hay is an important management tool in developing a proper nutritional program that delivers adequate nutrition for desired levels of production at the least possible cost.

Factors Affecting Hay Quality

Stage of Maturity. The stage of maturity of the forage at the time of harvest is the most important factor affecting nutritional content of hay. As a plant matures, its nutritional quality decreases. This is due to an increase in indigestible fiber (stem), decreased nutrient content (less leaves). Grasses mature faster than legumes such as clover or alfalfa. Thus nutritional quality of grasses such as Bermuda or Fescue drops off faster than that of legumes. Indicators such as stem size and stem softness as well as the presence of seed heads or flowers can help to gauge forage maturity. Hay containing mature seed heads will be low in nutritional quality. Desirable hay contains an abundance of leaves and generally lacks seed heads and large stems.

Level of Fertilization. Forages that have been properly fertilized will contain higher nutritional quality than those receiving inadequate fertilization. This is especially true of grasses, which lack the ability to fix nitrogen in the soil (unlike legumes). Fertilization/liming practices will directly affect the protein and mineral content of forages.

Presence of Weeds. Hay that contains a significant amount of weeds will usually be less palatable and less nutritious. Presence of weeds becomes even more significant when poisonous weeds are present or when weeds present physical hazards (such as briars, burrs or thorns).

Environmental Conditions During Forage Growth. Extreme environmental conditions such as drought, flooding, frost, etc. can have detrimental affects on forage quality and thus hay quality. For example, excessive rains immediately after fertilization will wash away needed nutrients. Drought or other stress conditions can cause well-fertilized Bermudagrass to accumulate nitrates.

Harvest Conditions. Not only is it important that hay is cut at the correct stage of maturity, but it is also important that hay be properly harvested. Leaves make up ~80% of the nutritional value of hay, thus it is important that harvest and handling procedures minimize the loss of leaves. It is also important that the weather cooperate during the cutting, baling and transport processes. Cut or baled hay that gets rained

upon will lose water-soluble nutrients, thus decreasing overall quality. Also hay that does not dry completely (either due to rain or high humidity) is prone to development of mold and/or excessive heating that can damage the protein content. Heat damaged hay is generally recognized by a dark brown coloring and distinctive odor.

Storage Conditions. Hay should be stored so as to minimize spoilage and weathering, which decreases overall hay quality. Typically, square bales are stored under shelter, while large round bales are stored outdoors. Bales stored outdoors will have higher storage losses than bales stored indoors. There are a number of techniques to minimize spoilage losses for outdoor storage. First, hay bales should be dense so as to minimize sagging and reduce the surface area coming in contact with the ground. Dense bales also shed water better and protect the inner part of the bale from spoilage. Store bales on a well-drained location to avoid bales soaking up moisture resulting in a large layer of spoiled hay on the bottom of the bale. A well drained, 4-6 inch coarse rock base is an ideal foundation for bale storage. Store round bales end-to-end long lines and place multiple lines at least 10 feet apart. Try to avoid stacking of bales as stacking traps moisture and limits drying action from sun and wind.

Presence of Non-Nutritive Factors. Hay may contain harmful toxins such as prussic acid (Johnson Grass or Sorghum), nitrates (Bermudagrass, Bahia, etc.), endophyte toxins (Fescue) or ergot toxin (most grass types). Hay that contains these potentially harmful substances may “appear” to be of high quality. Unless you are knowledgeable about the conditions under which the hay you are feeding was grown, a chemical analysis is your only tool for accessing the potential dangers from these toxins.

The discouraging thing about hay quality is that it will vary greatly from farm to farm and even from field to field or cutting to cutting on the same farm. Most livestock producers rely on visual inspection and smelling of hay to determine quality. While visual inspection will give clues as to the overall quality status of hay, it cannot confirm adequate nutritional content. Many a would-be hay buyer has been fooled by hay that looks, smells and feels good but actually contains only mediocre nutritional content or is high in dangerous toxins. This is why chemical forage analysis is so crucial. **Chemical analysis is the only true indicator of nutritional value.**

What is a Chemical Analysis?

A chemical analysis (also known as a feed analysis) is an important tool in determining the nutritional value of hay. The chemical analysis determines the feed value of the submitted sample on a chemical basis. Nutritional values listed in the feed analysis report will include such basics as moisture content, protein content, relative energy content, and levels of selected minerals. Often you can request special tests for certain toxins if you suspect that there may be a problem. Chemical analysis of hay is performed by the State (usually the landgrant university or Department of Agriculture) or can be performed by various private laboratories. Contact your local Sweetlix[®] dealer or Extension agent for detailed information on how to submit a representative hay sample and to obtain the Feed Sample form.

Advantages to Regular Feed Analysis:

- Increased accuracy in ration formulation
- Ability to identify high quality hay and feed accordingly
- Ability to identify inadequate or toxic hay before damage occurs
- Assists in the diagnosis of nutrition-related diseases

How Do I Know if I Need a Supplement?

Knowing the nutritional content of your hay will allow you to more efficiently allot hay according to the livestock needs. As a rule of thumb, young, growing intact males have the highest protein and energy requirements and should get the best quality hay, followed by young, growing castrated males, replacement females, lactating females, dry females and mature intact males. Knowledge of the nutritional content of your forages will also allow you to save money by purchasing the correct supplements to meet the needs of your livestock – no more, no less.

Average grass hay will fail to meet all of the protein, energy and mineral needs for lactating cows, mares, does or ewes and growing cattle, sheep, horses and goats. If you have not had your hay tested, it is best to assume that these groups of livestock need supplementation. Poor quality hay (stemmy, over-mature hay) should be fed to dry females and mature males whenever possible, but even these groups may need protein and energy supplementation if they are not in good flesh entering the winter months. A good mineral supplement is always recommended when feeding hay to all groups of livestock in order to prevent deficiencies.

What Types of Supplements Are Out There?

Nutritional supplements come in all shapes and sizes and range from commercially produced tubs, blocks or pellets to natural feedstuffs known to be relatively high in protein or energy such as soybean meal or corn. Choosing which type is best for your operation will vary according to individual circumstances. In many cases a variety of supplement products will best meet cattle needs. Contact your local Sweetlix[®] representative for more information.

Sweetlix[®] Protein Supplements Available:

Sweetlix[®] offers a wide variety of protein supplement products to allow the greatest amount of flexibility for livestock producers. Here are a few of the Sweetlix[®] supplements available through your local Sweetlix[®] dealer.

EnProAI[®] 25% PLUS Supplement

- A complete protein/energy/mineral/vitamin supplement in one convenient tub
- Delivers recommended levels of Optimin[®] proteinated trace minerals for increased reproductive performance
- 15% more energy than competitor chemical blocks
- Higher protein delivery than comparable low-moisture tubs
- Predictable feed costs (regular and consistent consumption of 1-2 lbs per head per day)
- Convenient, self-fed supplement

EnProAI[®] 16% & 20% Supplements

- All natural protein supplements ideal for all classes of cattle
- Deliver same amount of magnesium as high-mag minerals to help protect against grass tetany
- 55 to 60% TDN – up to 15% more than other chemical block formulas
- Predictable feed costs (regular and consistent consumption of 1-2 lbs per head per day)
- Convenient, self-feed tubs – no labor supplementation option
- Deliver twice as much protein daily as comparable all-natural low moisture tubs
- Recommended that you provide an additional complete Sweetlix[®] loose mineral supplement

EnProAl[®] 24% & 25% Supplements

- Ideal for cattle on low quality forages
- Added non-protein-nitrogen for optimal forage utilization and economical feed conversion
- Higher protein delivery than comparable low-moisture tubs
- Deliver same amount of magnesium as high-mag minerals to help protect against grass tetany
- Predictable feed costs (regular and consistent consumption of 1-2 lbs per head per day)
- Convenient, self-fed supplement
- Recommended that you provide an additional complete Sweetlix[®] loose mineral supplement

Sweetlix[®] 20% All Natural Goat Block

- All natural protein supplement ideal for all classes of goats
- Contains necessary levels of copper and selenium
- Complete mineral/vitamin supplement – no additional salt, minerals or vitamins needed
- Predictable feed costs (regular and consistent consumption of 2 to 4 ounces per head per day)
- Convenient, self-fed, 33 lb. blocks – no daily feeding labor

Sweetlix[®] All-In-One Pressed Protein Block

- All natural protein supplement suitable for all classes of sheep
- Delivers 100% of the daily requirement of trace minerals for sheep – no additional salt or mineral needed
- No added copper
- Convenient, weather-resistant block can be placed right in the pasture with the sheep

In summary, when hay quality is lacking, nutritional supplements are necessary to maintain reproductive and growth performance. Feed supplements pay for themselves in added production when used properly. For more information about the Sweetlix[®] line of protein supplement products for all classes of livestock and information to help you decide if they will fit into your management situation, contact your local Sweetlix[®] representative or call Sweetlix[®] directly at 1-87SWEETLIX.

Jackie Nix is a nutritionist with Sweetlix[®] (www.sweetlix.com). You can contact her at jnix@sweetlix.com or 1-800-325-1486 for questions or to learn more about the Sweetlix line of mineral and protein supplements for cattle, horses, goats, sheep and wildlife.

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