Hay, It's Not Just Quantity, But Quality

Part 1

TERESA STECKLER

MT. VERNON, ILL.

During the cold winter months or in times of drought when pastures contain meager forage, hay is the primary feed source for cattle. The quality of hay is dependent upon harvesting a high-quality hay, and the proper management through baling, storage and feeding. Hay harvest involves losses in dry matter and quality. So what is forage quality?

Hay (forage) quality refers to a forage's potential to meet the nutritional needs of an animal. There are several factors affecting forage quality (not yield). The relative importance of these factors is described below.

1. Maturity (harvest date). This refers to the growth stage of the plant at the time of harvest. Stage of maturity is by far the most important factor influencing quality. The younger the plant, the higher the quality – that is, as plants mature, they continually change in forage quality (accumulating indigestible lignin). Remember, forage plants can mature rapidly, leading to significant declines in forage quality every two or three days.

2. Crop species. Hay composition is highly affected by the species of forage present in the hay. Legumes are usually higher in protein and calcium than the grasses.

3. Harvest and storage. Hays experience a decrease in highly digestible sugars and starches during the curing process because of continued plant respiration after harvest. Management techniques that minimize curing time (use of the mower-conditioner, drying agents and/or preservatives) can also minimize loss. Improper harvest techniques can seriously reduce forage quality, primarily through the loss of leaves.

4. Environment (climate). During growth, environmental conditions (light, moisture, temperature and the amount of sunlight) affect hay quality, which in turn can limit its nutritive value. Generally speaking, forage quality declines as the summer progresses and tends to recover under autumn conditions. High temperatures increase the rate of plant maturation and cell wall lignifications (lignification of the cell wall is the primary factor limiting forage digestibility). Delays in harvesting due to bad weather result in more mature hay that is lower in quality.

5. Soil fertility. Soil fertility affects forage yield much more than it does quality. Although it is possible to produce high-quality forage on poor, unproductive soils, it is generally difficult to produce high yields of high-quality forage on these poor, unproductive soils. Adequate amounts of lime, nitrogen, phosphate, potash and certain minor elements are needed to produce high yields of hay. Use soil tests as an aid in determining the amount of fertilizer and lime needed for economical hay production. High yields of hay remove large amounts of nutrients. Since properly inoculated legume plants are capable of fixing atmospheric nitrogen, mixtures containing more than 25 percent legumes usually do not give economic responses to nitrogen fertilization.

In addition to the five primary factors affecting hay quality, several secondary factors can affect hay quality. These factors include the presence of weeds, insect pests and plant diseases. Hay quality varies due to numerous factors, but high-quality hay is the end product of good growing conditions, correct timing of harvest, and proper handling from harvesting to feeding. Δ

TERESA L. STECKLER: Extension Specialist, Animal Systems/Beef, University of Illinois.