Forages
by Dr. Rocky Lemus

Forage testing assesses the nutrient composition of forages and permits a producer to develop feeding programs and commercial hay producers develop marketing strategies. Drought conditions in Mississippi have increased the demand for hay, and prices throughout the state remain high. Since hay and other stored forages play a major role in winter feeding programs, having the hay tested now will provide producers with adequate time to design a good feeding program that improves hay utilization and optimizes livestock performance. Forage testing will provide more accurate information about the forage nutritive value and how to adjust the amount of protein and energy supplements necessary to meet animal requirements.

Forage quality is defined as the potential of forage to produce a desired animal response (consumption, nutrition value, and the resulting animal performance). Hay quality includes palatability, digestibility, intake, nutrient content, and anti-quality factors.

How to collect a hay sample? Producers should routinely get a representative hay analysis of all hay since forage quality can change based on forage species and mixtures, maturity, management, harvest and storage conditions, rain damage, and insect or disease damage. Every hay lot should be sampled separately. A hay lot is defined as hay from the same field, same cutting, harvested under the same environmental conditions, and having a uniform forage composition (grass or legume only, or grass/legume mixture).

To accurately determine the quality of the hay, a representative sample must be taken using a hay probe. Use a hay probe that is 12 to 24 inches long and 3/8 to 5/8 inches in diameter. Grabbing and pulling hay from different bales is not the correct method, and it will not provide uniform samples for analysis. Producers should sample 15 to 20 round bales depending on the number of bales in the lot, and samples should be taken in the round edge of the bale. For example, a hay lot that contains 300 bales, sample every 15th bale to obtain a representative sample of the entire lot. If the outer layer of the bale has deteriorated, remove that layer before sampling to avoid collecting material that will skew the analysis.

Some producers might obtain samples directly for the standing forage in the field. These samples should be taken shortly before the livestock are turned into a pasture. The producers should walk over the entire field and collect 30 to 50 random small grab samples. The grab samples are taken by reaching down and grabbing a small section of forage between the thumb and first finger and at the same height that the livestock will graze the pasture. Avoid collecting samples in areas that have high weed infestation or areas that have high concentration of legumes or grass.

Sample at least 10 square bales near the center of their ends to ensure a uniform distribution of leaves and stems in the sample. If square bales have been stacked in an open barn, collect samples in both sides of the barn in a zigzag pattern or at dif-

ferent heights. Once the samples are obtained from each lot, mix the samples thoroughly in a bucket and store in a quarter-size plastic zip-lock bag. Hay samples are perishable, so it is important to ship or deliver the samples to the lab as soon as possible to prevent moisture loss and microbial deterioration of the sample.

The most practical way to determine the quality of feed and forages is through chemical analysis. Submit hay samples in a quarter-size zip-lock bag. Label the bag with the all the necessary information using a permanent marker (producer's name, hay lot, forage species, hay cutting, weather conditions, etc). Sometimes information written on a plastic zip-lock bag could be erased, so make sure that a label with the same information is placed inside the bag as a preventive measure and for easy identification. Fill out the information sheet provided by the forage testing lab. If producers are working with Extension agents and livestock or forage Extension specialists, some laboratories will send copies of the report to them as well, so make sure their names and addresses are in the appropriate places on the form.

Depending on where the samples are sent for analysis, quality assessment and hay feeding adjustment results can take up to three weeks, depending on the time of year and the location of the forage lab. Mississippi State Chemical Lab can process forage samples for nutrient analysis, or send samples to a private certified forage testing lab of your choice. For more information on how to send samples to Mississippi State, visit http://www.msucares.com or contact your County Extension Office. The cost for analysis of CP, ADF, and NDF ranges from about $15 to $50, depending on labs. Once the results come back, use them to balance the forage-feeding program for the various groups of livestock on your farm.

Hay utilization by livestock can be improved by knowing the nutrient composition of the hay--especially crude protein, fiber, and total energy. The accuracy of forage analysis depends on the sample that you send to the lab. In many feeding programs, the sample is the weak link. The results of the lab tests will be useful only if the sample accurately represents what your animals will be eating. This information could decrease feed cost per animal, while maintaining or increasing production. Poor sampling will result in misleading values, higher feed costs, and reduced performance. Keep in mind that every field and every cutting will be different. Increasing profitability per animal will depend on forage quality and utilization. The results of forage tests may be compared to the requirements for TDN and protein of different classes of livestock. If you do not know how to use the results, contact your County Extension Office or livestock/forage specialists for guidance. It is important to balance hay nutrient composition from test results when possible with proper minerals and vitamins or appropriate additives.

Table 1. Forage Quality Standards.

	Grass Hay		Legume Hay	
Quality	**TDN**	**CP**	**TDN**	**CP**
	---------- Percent Dry Matter Basis ----------			
Excellent	**> 58**	**> 12**	**> 64**	**> 18**
Good	**55 – 57**	**10 – 11**	**60 – 63**	**16 – 17**
Fair	**52 – 54**	**8 – 9**	**57 – 59**	**14 – 15**
Poor	**< 52**	**< 8**	**< 57**	**< 14**

Note: Determine hay quality by TDN rating. If hay does not meet CP requirements or is less Than 83% DM, lower one grade. Source: www.msucares.com