

## HAY QUALITY TESTING: WHAT DOES IT MEAN?

Recognizing quality differences is important to both producers and buyers of hay. Research and experience show that combining visual inspection with chemical analysis greatly improves your accuracy when you predict the nutritive value of hay. But what do those numbers on the hay test report mean?

A chemical analysis is valid only to the extent that the sample truly represents the stack or lot of hay under consideration. Use of a core sampler to get that representative sample is essential. Commercial forage samplers are available through farm supply sources. Many county Extension agents have a core sampler to borrow.

A lot of hay should represent hay harvested from the same field, the same cutting, and the same stage of maturity. If two lots of hay are in a stack, sample them separately. Bales within a lot of hay should be sampled at random. A minimum of 20 core samples are recommended for a lot of 10 tons or more.

To promote common methods of hay testing and reporting, a standardized test has been developed. The common analyses found on many hay test results include dry matter, crude protein, acid detergent fiber, neutral detergent fiber, calculated total digestible nutrients and relative feed value, and the minerals calcium and phosphorus.

**Dry matter (DM)**. At the time of baling, moisture content may range from 10 to 25% (90 to 75% dry matter). Usually hay test results will be reported on an as-fed basis and on a 100% dry matter basis. This puts all hay on a common basis for comparing feed values of hays with different moisture contents.

**Crude protein (CP)**. The quality of hay is closely related to its crude protein content, since it's related to stage of maturity and leafiness. Hay high in protein allows the livestock producer to save money by reducing the need for higher cost protein concentrates in the ration.

**Acid detergent fiber (ADF)**. Hay quality is also related to its energy content. This test result indicates the available energy in hay. ADF is the plant fiber that remains after an acid detergent removes part of the digestible cell wall material and the cell contents. ADF has a negative correlation with digestible energy (DE); that is, as ADF increases, digestible energy decreases.

**Neutral detergent fiber (NDF)**. This is the plant fiber that remains after a neutral detergent is used to remove cell contents in the testing lab. NDF has a negative correlation with feed intake; as NDF increases, feed intake decreases.

**Total digestible nutrients (TDN)**. This has been the most extensively used measure of feed quality in the United States. It is the sum total of all digestible organic nutrients – proteins, nitrogen-free extract (plant cell contents), fiber, and fat. TDN is most often estimated and calculated from a single fiber test, such as ADF.

**Relative feed value (RFV)**. This estimate of overall forage quality is calculated from estimates of intake (from NDF) and digestibility (from ADF) of forages on a dry-matter basis.

The test results for the minerals **calcium and phosphorus** are needed for the feeder of hay to develop a ration with the proper balance of calcium and phosphorus. This is usually in the 1:1 to 2:1 range.

Livestock producers recognize the value of high-quality hay. When you use high-quality hay, you reduce the quantity of supplement that you must feed. The increased palatability of high-quality hay also results in greater consumption. It costs the hay grower more to produce high-quality hay. Thus livestock feeders should expect to compensate those growers who are willing to produce high-quality hay.

For more information on hay quality testing, see http://www.forages.psu.edu/topics/forage\_ga/why.html

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