

January 21, 2014

TESTING FORAGES AND INTERPRETING RESULTS

Forage testing is a tool to determine current nutritive values as well as non-nutritive values in forages that can be used for marketing hay, formulating rations, and determining potential toxicities from prussic acid, nitrate, alkaloid, etc. Forage testing is a guide; you should never rely solely on testing, particularly if the forage is a nitrate accumulator.

The most important thing in forage sampling is to have a representative sample. The proper method of sampling depends on the type of forage. Hay: For large round bales, forage samples should be taken from the sides not the front or back, to get a cross section of the rolled hay. The Extension Office has a hay probe for checkout. Take a separate sample from each field and cutting; otherwise, forage quality analysis can give you misleading information. Take at least 20 core samples from each hay lot, composite the samples, mix them thoroughly, and take a sub-sample for analysis. Put the sub-sample into a clean, airtight plastic bag with a label including your name, address, forage type, stage of maturity, and date harvested.

Haylage or Silage: Silage quality can vary with silage-making techniques and management skills. Collect one- to two-pound samples from the silo as it is discharged from the silage unloader. Do not collect samples from spoiled material on top of the silo. Collect samples from the morning and evening feedings over a two-day period. Mix the samples well, place in a clean plastic bag, seal, and store immediately in a cold place such as refrigerator or freezer until samples are shipped to the lab.

Interpretation of Forage Quality Analysis Results: The percent moisture is valuable to know because the dry matter provides the energy and nutrients. Crude protein is the amount of nitrogen in the forage. It is the sum of true protein and non-protein nitrogen. True protein such as microbial protein is utilized in rumen as the food for rumen microbes.

Acid detergent fiber (ADF) is the sum of hard to digest starch forms. It is inversely related to digestibility. As the ADF percentage increases, then digestibility and energy value decrease. Neutral detergent fiber (NDF) is the sum of hemicellulose and lignin. NDF is a predictor of feed intake potential or gut fill in rumen, and is inversely related to feed intake. If the NDF is low, then feed intake can be high. In general, forage legumes tend to have lower NDF values than grasses. It depends on the stage of maturity at harvesting.

Total digestible nutrients (TDN), is directly related to digestible energy and is the sum of digestible fiber, starch, sugars, protein, and fat in the forage. TDN is useful for beef cow rations that are primarily forage. Net energy maintenance (NE_M) and lactation (NE_L): Net energy is the energy concentration in a feed. It can be measured by laborious animal trials or can be predicted using either ADF or NDF.

Relative forage value (RFV) is an index used to rank forages based on ADF and NDF values. No unit value is used for RFV. It measures overall feed value of forage and it is used in hay markets, in particular alfalfa.

This column was prepared using materials presented by John Holman, Kansas State Cropping Systems Agronomist, jholman@ksu.edu

Paul C Hay, Extension Educator
University of Nebraska-Lincoln Extension in Gage County • 1115 West Scott Street, Beatrice NE 68310
(402) 223-1384 • FAX: (402) 223-1370 • email: phay1@unl.edu

