



Ridin' Herd

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Probe it now

If you haven't yet tested your forages for the winter feeding program, do it now. Quality can vary a bunch. Forages are the primary energy source for beef cows. Hopefully, up until now, most cows have been grazing crop residue or stockpiled forage. As far as harvested forages are concerned, as forages mature digestibility decreases because of the increase in fiber. When designing diets using harvested feeds, many rations are balanced using average values, and these "book values" often result in over- or underfeeding certain nutrients. More-economical and better-balanced rations can be formulated using nutrient concentrations determined from feed analysis.

Proper sampling is key

Forage testing laboratories will not accept a "grab" sample of a baled forage. Sample baled hay using a forage probe. Most Extension offices will have a forage probe. If they don't, they will know where you can find one. A forage probe is essential for collecting a representative sample.

For large round and square bales, the probe should penetrate at least 18 inches (in.) into the bale and have an internal diameter of at least $\frac{3}{8}$ in. If the probe is 18 in. long or longer, 15 large round bales should be adequate if the "lot" size is 30-40 bales.

Collect one sample from each bale by coring straight in from the center of the end of square bales and from the wrapped circumference of round bales.

Get a representative sample for each "lot" of hay. Different cuttings of alfalfa need to be sampled separately. Early-season cut grass hay should be sampled separately from middle-of-the-season and late-season hays. Grass hays harvested at different locations need to be sampled separately. Place the entire sample from each "lot" into a plastic bag and seal tightly.

For loose or compressed haystacks, use a hay probe at least 24 in. long to collect 15 or more samples from each "lot."

Label the sample bag with your name, address, lot ID, and type of material. Most testing labs provide a description sheet to report this information and to request the desired tests. Place samples in polyethylene freezer bags, squeeze the air out of the bag, and seal tightly. Use extra caution if subdividing a large hay sample, because subsampling dry hay can result in loss of fines and leaves. Freeze samples containing more than 15% moisture until shipping; store dry samples in a cool location.

It is not too late to sample forages now,

because most forages are analyzed using near-infrared reflectance (NIR) spectroscopy. NIR is a rapid, reliable, low-cost, computerized method to analyze feeds for their nutrient content. It uses near-infrared light rather than chemicals to identify important compounds and measure their amount in a sample. Feeds can be analyzed in less than 15 minutes using NIR, compared to hours or days for chemical methods.

Make sure that the sample is properly identified, because this is important to get accurate results. NIR does not do a good job of measuring minerals, although it does a decent job measuring calcium (Ca) and phosphorus (P), likely because these minerals are tied closely to organic matter. If you think you need a mineral analysis, consider using the chemical method.

What nutrients to analyze for cows

For what nutrients should producers with cows analyze the forages?

Dry matter (DM): Percent DM is the percentage of feed that is not water. In contrast, moisture is a measure of the amount of water in the feed on an "as is" or "as fed" basis. It is important because moisture dilutes the concentration of all nutrients. Beef cow diets are formulated on a DM basis, then, using the DM percentage, are converted to the amount of feed needed to be fed.

As an example, if the diet calls for grass hay to be fed at 25 pounds (lb.) per head per day and the hay is 15% moisture, and therefore 85% dry matter, you would need to feed each cow 29.5 lb. per head per day ($25 \text{ lb.} \div 0.85$) to account for the water in the hay.

Crude protein: Percent CP measures nitrogen concentration. However, CP will measure both true protein and nonprotein nitrogen because the actual measurement is

%N. The new metabolizable protein (MP) system that was introduced in the 1996 *Nutrient Requirements of Beef Cattle* (NRC) incorporates degraded intake protein (DIP) and undegraded intake protein (UIP, or bypass protein).

The DIP and UIP percentages must total 100% of the protein and are normally expressed as a fraction of the CP. So, if the DIP of a forage is 70%, then UIP is 30%. If the CP of that same forage is 10%, then DIP is 70% of DM ($10\% \times 0.70 = 7\% \text{ DIP}$) and the UIP is 30% ($10\% \times 0.3 = 3\% \text{ UIP}$). Because NIR does not measure DIP and UIP, use book values from the 1996 NRC.

If the CP and adjusted CP numbers (ACP) are not the same, it indicates that there has been some heat damage in the forage. Use to the ACP value in developing diets for this feed.

Total digestible nutrients (TDN): TDN represents the total of the digestible components of crude fiber, protein, fat ($\times 2.25$), and nitrogen-free extract in the diet. This value is calculated from ADF in the NIR analysis. TDN is still used to calculate beef cow rations where the diet is primarily forage.

Relative feed value (RFV): RFV combines digestibility (ADF) and intake (NDF) into one number for a quick, easy, effective way to evaluate the quality of alfalfa and/or haylages. It is used primarily with legume or legume/grass forages. RFV is most valuable for formulating diets for dairy cows and not really useful in balancing diets for beef cattle. It provides an index to rank a forage according to its digestible energy intake potential. RFV also has been used widely in hay marketing, but is not used in developing cow diets.

Final thoughts

Every year there seems to be a lot of differences in forage quality. Cows need diets that meet their needs, especially after calving. Continue to explore opportunities to reduce cow costs. Testing forages for quality will allow you to know the quality of the forages in the stack yard. In addition, if you know the nutrient needs of the cattle you are feeding, you may or may not need additional feeds or supplements to meet the requirements.

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Editor's Note: "Ridin' Herd" is a monthly column written by Rick Rasby, professor of animal science at the University of Nebraska. The column focuses on beef nutrition and its effects on performance and profitability.