

## RELATIVE FORAGE QUALITY



Relative Forage Quality (RFQ) is a calculated value based on TDN and expected feed intake. It is expressed as a single number to rank forage nutrient value, and is based on full bloom alfalfa, which has an RFQ of 100. Values below 100 indicate lower quality than full bloom alfalfa and values above 100 indicate higher quality RFQ. RFQ values can range from 50 to 250. RFQ can compare different forage types and is often used for pricing hay. Beef animals at different stages of production have different requirements of RFQ, as seen in the chart above. RFQ results may need to be specifically requested from the lab.

## MINERALS (Ca & P)

Stage of Production	Calcium, %DM	Phosphorous, %DM
Dry Cows	0.25 - 0.30	0.16 - 0.19
Cows at peak lactation	0.27 - 0.34	0.18 - 0.21

There are many minerals needed in a cattle diet. Calcium (Ca) and Phosphorus (P) are two of the most important macrominerals for beef cattle, and are critical for growth and lactation. The ideal Ca to P ratio is 2:1 to 4:1. If P exceeds Ca, it can hinder calcium absorption, requiring Ca supplementation. When hay is low in either mineral, most complete mineral supplements can meet the cattle's needs.

## CONCLUSIONS

More and more beef producers nationwide are having their hay sampled to analyze its nutrient content. This is a relatively simple and affordable process that gives cattlemen an in-depth look at the actual nutrient profile their herd will receive from hay, allowing them to plan supplementation to be sure they meet their herd's requirements.

This handout only goes over the most common nutrient values and numbers represent rough averages, which can vary based on environment, animal history, stress level, genetics, and more. For more in-depth help interpreting your hay analysis report, contact your local UW Extension office. A list of offices can be found at [www.uwyo.edu/uwe](http://www.uwyo.edu/uwe) under "County Offices." We can also help you collect and send off hay samples to the lab of your choice! Feel free to reach out to Dagan Montgomery (contact info below) with specific questions regarding your hay's nutrient quality and feeding plan.



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## HAY TESTING FOR CATTLE: Understanding the Results

What the results from a hay analysis mean and what values to look for.

[www.uwyo.edu/uwe](http://www.uwyo.edu/uwe)

## WHY SAMPLE YOUR HAY?

Hay, from both grass and legumes, is the primary winter feed that must see most Wyoming beef herds through the toughest months of the year. Testing hay for quality helps determine its nutritive value and whether it meets the varying nutrient needs of cattle at different stages of production. Hay test results guide decisions regarding when to supplement and what supplemental feed is needed. For example, if hay doesn't contain the crude protein required for a herd of growing replacement heifers, we know we will need to provide them a protein supplement, such as alfalfa, to set them up for success down the road. This handout provides average nutrient values\* to consider in hay analysis to ensure cattle get the necessary nutrients for growth and productivity.

*\*Derived from the Nutrient Requirements of Beef Cattle (2016)*

## MOISTURE CONTENT & DM

Harvested Forage Type	Ideal Dry Matter, %DM
Hay	85% DM
Baleage	40 - 60% DM
Silage	30 - 40% DM

Moisture content is one of the first values listed in a hay analysis, showing how much water the hay contains. A lab report often separates results into As-Fed and Dry Matter (DM) values, with DM being the more accurate measure for assessing nutritive value, as this removes the dilution of water and allows comparison between hay samples with different moisture content. Recommendations, such as the minimum 7% crude protein needed for dry cows, are based on DM. All values in this document are based on DM. Hay usually contains 10-15% moisture, and is therefore 85% DM. Higher moisture levels in hay can reduce its nutritive value over time. Forages like baleage and silage require more moisture for proper preservation.

## CRUDE PROTEIN (CP)

Stage of Production	CP required, %DM
Dry pregnant cow	>7% CP
First 60 days of lactation	11% CP
Rest of lactation	9% CP

Crude Protein (CP) is one of the first things nutritionists look at to judge whether hay will be enough to provide for cattle. CP is critical for growth, lactation, and gestation. 7% CP is the **bare minimum** to support dry mature cows, as this is needed to keep the rumen functioning. Other classes of cattle need more CP. If your hay lacks enough CP, consider supplementing with good sources like alfalfa hay or distiller's grain products.

## FIBER (NDF & ADF)

Fiber	Range, %DM	Ideal
NDF	40 - 65%	< 60%
ADF	30 - 45%	< 40%

Fiber in hay is measured as Neutral Detergent Fiber (NDF) and Acid Detergent Fiber (ADF), and represents the plant's cell wall components. NDF includes hemicellulose, which is relatively digestible in the rumen. NDF affects how much cattle can eat. Higher NDF lowers feed intake and is ideally under 60% of DM. ADF includes just cellulose and lignin, the least digestible parts of the plant. Higher ADF means lower digestibility. Good hay should have less than 40% ADF. Hay with lower NDF and ADF is higher quality, and these values vary with forage type (higher in grass than alfalfa), maturity (younger forage has less fiber), and other factors.



## ENERGY VALUES (TDN)

Grass Hay	TDN, %DM
High Quality	> 58%
Medium Quality	52% - 58%
Low Quality	< 52%

Feed energy for beef cattle can be measured in several ways, but is most often reported as Total Digestible Nutrients (TDN), a calculated value summing up total digestible nutrients using carbohydrates, protein, and fat content. The calculation varies by forage type (pure grass hay versus legume hay and legume-grass mixes), so it is important to specify what kind of forage you have when submitting a sample. Higher TDN indicates more energy-dense forage, with hay above 58% TDN considered high quality and below 52% considered low quality. TDN requirements vary by production stage, with growing animals like heifers and calves typically needing more based on expected final weight and daily gain. The table below shows the TDN requirements for a mature 1,200-pound cow at various stages of production.

Stage of Production	TDN required, %DM
Second trimester of pregnancy	~50%
Third trimester of pregnancy	~54%
First 90 days of lactation	58% - 61%