

Linking Forage Quality with Economic Value

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Forage quality is often defined as the ability of a forage to support milk production when fed to cows, but that definition is very difficult to quantify. Relative forage quality (RFQ) was developed to quantify forage quality and should allow the price of forage to better reflect the milk production potential of a forage. The price of alfalfa hay is correlated with RFQ and depending on local markets a 10 unit increase in RFQ may increase the value (price) of alfalfa hay by \$12 to \$16/ton. The RFQ equation includes concentration of NDF (negative relationship) and in vitro NDF digestibility (IVNDFD) (positive relationship) and is essentially a proxy for energy intake. Energy intake is usually what limits milk production, but other nutrients are needed to produce milk and they also have economic value. Rather than using an index, a better approach would be to use actual nutrients. The nutrients that have the greatest value in forages are energy (expressed as NEL) metabolizable protein (MP) and NDF. Feed labs routinely measure NDF and generate estimated NEL concentrations in samples and MP can be estimated from measured crude protein (CP) concentrations. We also have methods of estimating the economic value of nutrients (\$/Mcal of NEL; \$/lbs. of forage NDF; and \$/lbs. of MP). To arrive at a baseline value for hay, you need to calculate the amount of NEL, MP and NDF in 1 ton of hay, multiple each by its unit value and then sum. RFQ (or RFV) gives CP no value; it is not in the equations. The concentration of CP is moderately correlated with RFQ ($r^2 = 0.35$), but an alfalfa sample with an RFQ of 200 could range in CP from about 18% up to 27%. In addition to supplying nutrients, forage also affects feed intake. A lab measure that has a strong positive relationship to intake and milk production is IVNDFD. On average a 1 unit increase in IVNDFD increases intake and milk by 0.26 and 0.47 lbs./day, respectively. The baseline value calculated above needs to be adjusted based on the difference in IVNDFD from your sample and the lab average (this can be positive or negative). The adjustment depends on the price of milk and the cost of feed (this calculation will be discussed). For example, if feed dry matter is \$12/cwt and milk is \$24/cwt a 1 unit increase in IVNDFD above average is worth about \$7.4/ton of alfalfa hay dry matter. This method is more complicated than using RFQ but the calculations are straightforward and more accurately values alfalfa which should benefit both the seller and buyer.