USDA United States Department of Agriculture

Illinois Grazing Manual Fact Sheet

LIVESTOCK NUTRITION

Relative Forage Quality (RFQ)

General Information

Relative Forage Quality (RFQ) is a new index to rank the quality of forages. Such an index is helpful in ranking forages for sale or inventorying forages to animal groups to meet certain quality needs in the ration.

This fact sheet is a follow-up to an earlier one (November 2000) titled Forage Quality.

Relative Feed Value (RFV) has been of great value for years as a quality index for ranking cool-season grasses and legumes based on combining digestibility and intake potential. These values have been calculated from acid detergent fiber (ADF) and neutral detergent fiber (NDF).

With introduction in 2001 of new approaches to determine animal requirements in the National Research Council Nutrient Requirements for Dairy Cattle, there was an opportunity to improve RFV through use of newer analyses and equations.

Thus, the concept of Relative Forage Quality (RFQ) was introduced as a method to better predict animal performance from the analysis of forages.

Differences Between RFV and RFQ

RFV is based on the concept of digestible dry matter intake relative to a standard forage according to the following formula:

RFV = (DMI, as % of BW) x (DDM, as % of DM) ÷ 1.29

Where: DMI = Dry matter intake
DDM = Digestible dry matter
BW = Body weight
DM = Dry matter

Dry matter intake was estimated from neutral detergent fiber and digestible dry matter estimated from acid detergent fiber. The constant, 1.29, was chosen so that RFV = 100 for full bloom alfalfa hay. The constant was the expected DDM intake, as % of BW, for full-bloom alfalfa based on animal data.

RFQ uses the same concept and format except that TDN (total digestible nutrients) is used rather than DDM. In other words, RFQ has a digestible fiber component and is calculated as follows:

RFQ = (DMI, as % of BW) x (TDN, as % of DM) ÷ 1.23

RFQ adjusts intake for digestible fiber. Research has shown that intake is affected by digestibility of the fiber.

RFQ appears to give a much better quality estimate for grasses and legume-grass mixtures.

RFQ can be used for all forages, including warm-season grasses and brassicas (turnips, kale, rape, etc.). However, RFQ should not be used for corn silage because so much of the energy differences in corn silage relate to starch availability, which is not considered in RFQ.

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Relationship Between RFV and RFQ

Analysis from numerous forage samples shows a strong correlation between RFV and RFQ.

The intent with RFQ was to have the same mean and range in forage analysis as RFV. Therefore, RFQ could be substituted for RFV without making economic and other management changes. It appears that RFQ can be substituted for RFV and they will be similar in about 60% of the samples.

In some individual forage samples, RFV and RFQ varied by over 20 points. When differences like these do occur, it is believed that RFQ will be a better estimate of animal performance than RFV. Also, RFQ more accurately discounts heat damaged hay or haylage.

In instances where RFQ was higher than RFV, the hay seller could have received more money for the hay (or the buyer could have simply received a good deal) and where RFQ was lower than RFV, dairy cows would not have milked as expected.

Summary

Due to the digestible fiber component, RFQ seems to predict animal performance better than RFV. It appears that RFQ and RFV average about the same, so RFQ can be substituted for RFV in pricing, contracts, and other uses.

Where to Get Help

For more information about Relative Forage Quality, contact the local office of the Natural Resources Conservation Service or University of Illinois Extension.

Acknowledgments

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Natural Resources Conservation Service

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ILGLCI Illinois Grassland Conservation Initiative