

THE IMPORTANCE OF CHOOSING A CERTIFIED LAB

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ABSTRACT

Historically, forages have been marketed on the basis of color, texture, smell and even taste. More recently, these subjective measures have been supplemented by analytical values such as crude protein, crude fiber, acid detergent fiber, neutral detergent fiber, and others. Confusion over how to interpret these analytical values directly led buyers and sellers to utilizing other measures, such as TDN or RFV, calculated from these analytical values. This has in turn led to a pricing system in many areas of the country that is based on these calculated values. While sampling variability is the largest source of variability in forage testing, laboratory or analytical variability can also play a large role. Typical variability between labs is usually much greater than within a given lab. The key to getting reliable results is to select a laboratory that is both accurate (gets the right result) and precise (has minimal error or variability). One way to accomplish this is to select a lab certified by the National Forage Testing Association (NFTA). Typical variability is discussed, and the impact of good and bad data is demonstrated through the use of economic examples.

INTRODUCTION

The National Forage Testing Association (NFTA) was formed with the central mission of improving the accuracy, reproducibility and general reliability of forage analysis, as well as improving understanding of a uniform forage testing procedure. To accomplish this mission, NFTA administers a proficiency testing and certification program. Currently, this program consists of six samples per year (four alfalfa hay, one corn silage and one grass hay) and certifies laboratory performance on analysis of dry matter, crude protein (CP), acid detergent fiber (ADF), and neutral detergent fiber (NDF). In simple terms, for a laboratory to be certified, it must maintain an average grade of “C” or better. Grades are assigned based on the ability of the individual laboratory to match the mean value for each analyte obtained by the reference method labs (accuracy) and takes into account the variability of the lab (precision) in the overall grade. Grades of “C” or better are required for certification, and certifications are given for either wet chemistry or NIRS analysis.

When choosing a lab, producers should ask several questions: (1) Are you NFTA certified? (2) How do you process samples? (3) May I see your NFTA grades? (4) Do you run the reference method on all your customer samples? (5) If an NIRS lab, how often do you verify results with wet chemistry? (6) What kind of quality control program do you have?

Make certain that the lab answers each question fully and to your satisfaction. There is no confidentiality imposed by NFTA on an individual lab sharing its grades, but the NFTA won't share a member lab's grades. Each lab can make that decision, though.

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NORMAL VARIABILITY

So how much variability should we expect? Remember, forage is a complex, biological system, so we need to expect some variability. Normally, we would see CP \pm 0.5%, ADF \pm 0.7%, and NDF \pm 1.0% if we were to split a sample and send it to several different certified labs. Of course, within a given lab, variability should be and typically is much lower than the aforementioned ranges. (Of course, we're assuming that the sample is representative of the hay in question).

So, what impact does this variability potentially have on the sale of forages? When sale of hay is based on TDN, each change of 1 percentage point ADF leads to a change of \$5.06 per ton on average (Dan Putnam, personal communication, unpublished 10-year data set). Thus, with a normal range of \pm 0.7% ADF, price would vary by \pm \$3.54/T.

When hay sales are based on RFV, an even larger range of variability can be found because now two factors (ADF and NDF) vary instead of just one. If we look at the impact of normal variability on RFV, we see that varying ADF and NDF by the normal amounts results in a 6-point variation in RFV. With dairy hay in some areas at \$0.75 per point of RFV, this can mean plus/minus \$4.50 per ton.

The above examples show what can happen when normal variation is seen in forage analysis. What if your lab isn't certified? What if your lab has twice the "normal" variability for one or more of these tests? Worse, what if your lab has three or four times this "normal" variability?

The conclusion to be drawn from this is not that testing is useless! Rather, we should realize that forages are a multi-faceted system and are not adequately described by any one number, be it TDN, RFV, or RFQ. At the same time, we should select a lab so that the variability in our data is minimized and we obtain the most useful, precise and accurate data we possibly can about our forage.

The best way to accomplish this is to choose a lab that chooses excellence. Choose an NFTA-certified lab! For a current list of certified laboratories, and other information on forage testing, see <http://www.foragetesting.org>.

REFERENCES

Collins, Mike, Vance Owens, Dan Putnam, Paul Meyer, Gary Smith and Mike Wolf. 2000. Hay Sampling Demonstration Results. *In*: Proceedings of National Forage Testing Association Annual Meeting, 4-8 June 2000, Sioux Falls, SD. National Forage Testing Association, Omaha, NE.

Putnam, Dan. 2002. Personal Communication. Unpublished 10-year data set on hay pricing and hay quality in California. UC-Davis.