

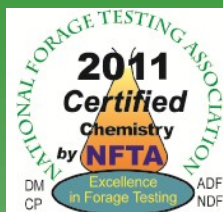


Ag Health News

LABORATORIES

April 2011

445 Barnard Blvd.
Sunnyside, WA 98944
Phone: (509) 836-2020
Fax: (509) 836-2030
ahlabs@aghealthlabs.com



Free!

We are looking for samples of BMR (Brown Mid-Rib) corn silage from 2010 to analyze for fiber and starch levels. Any BMR samples submitted through May 31st will be run for free to increase our data on this highly digestible corn variety. It would be nice to concurrently run a conventional silage sample, but those will be at your expense.

Thank you,
Ag Health Feed Lab

Now Available!
Automatically
download BIOPRYN
results with Dairy
Comp 305! Call for
more information.

Contacts:
Lynn VanWieringen, PhD
Crystal Maiden, BS
Fred J. Muller, DVM

Forage Quality Pays!

As the weather begins to change, it is time to think about growing and harvesting forages again. Don't forget to focus on quality! It can be difficult due to circumstances that are out of your control (weather, equipment problems, harvest schedule for custom operators). However, the impact of forage quality on dry matter intake (DMI) and milk production is great.

What Factors Affect Forage Quality?

Forage quality can be affected by numerous factors including;

1. Species differences (alfalfa versus triticale)
2. Temperature (plants grown at high temperatures usually are lower in forage quality)
3. Stage of maturity at harvest (\uparrow maturity results in \downarrow forage quality)
 - a. Digestibility of forages can drop $\frac{1}{2}$ percentage unit per day from peak digestibility
 - b. Peak digestibility usually occurs somewhere between 2 to 3 weeks after growth initiation in the spring
4. Leaf-to-stem ratio
 - a. Leaves have \uparrow nutrient value vs. stems
 - b. The proportion of leaf to stem \downarrow with \uparrow maturity
5. Grass-legume mixtures (lower crude protein vs. straight legume)
6. Fertilization
 - a. Fertilization of grass with nitrogen can improve CP content
 - b. Fertilization does not usually affect digestibility of the forage
 - c. Fertilization with phosphorus (P) and potassium (K) can improve yields but can also reduce forage quality when growth is rapid.
 - d. Excessive amounts of certain elements can reduce availability of other nutrients

New Shipping Options

We have recently improved our shipping capability at Ag Health Laboratories in order to better accommodate our client's needs. Now we can send our clients labels for shipping samples to Ag Health, and shipping will be charged to Ag Health's shipping account. You will be billed for the shipping after the lab work is completed at a lower rate than before. There are three ways we can send labels to our clients. We can send by email, mail, or UPS can send shipping labels to the client with Ag Health Lab's address. Inform us in advance of when you need labels to send samples. We will then send you a label by any one of the three methods. Once you receive the label, please attach it to the package. Drop the package off at a UPS drop site, or have it ready for UPS to pick up. We take care of all of the paperwork!

Please call us at (509) 836-2020 or email ahlabs@aghealthlabs.com to request labels. When requesting a shipping label, please include your name, address, email address, how you would like your label sent, and if you'll need it picked up by UPS or are dropping off at a UPS drop site. We hope our improved shipping capabilities will make it more convenient for our clients. Please call with any questions that you may have about shipping your samples. We will be happy to answer them!

7. Daily fluctuations in forage quality
 - a. Research has documented that soluble carbohydrates tend to be highest in the alfalfa plant in late afternoon compared to early morning.
 - b. Research has documented that forage quality is higher in alfalfa harvested in the late afternoon in low rainfall areas
 - c. The advantage in forage quality harvested in late afternoon is greatest on cool sunny days when the alfalfa is highly conditioned
8. Variety effects
 - a. Different varieties of forage within a species can vary in nutrient digestibility
 - b. Make sure that improved quality of a variety does not come at the expense of a substantial yield reduction.
9. Harvesting and storage effects
 - a. Rainfall during field drying of alfalfa can greatly reduce forage quality due to leaf shatter, plant respiration, and leaching
 - b. Fiber levels ↑ sharply and digestibility ↓ sharply with moderate rainfall
 - c. Leaching can ↑ amounts of unavailable protein in alfalfa
 - d. Rainfall during field drying of grass is less severe on forage quality than alfalfa
 - e. Forage quality losses occur during storage due to weather conditions, plant respiration, and microbial activity
 - f. Forages stored outside tend to have much more severe reductions in forage quality than forage stored inside

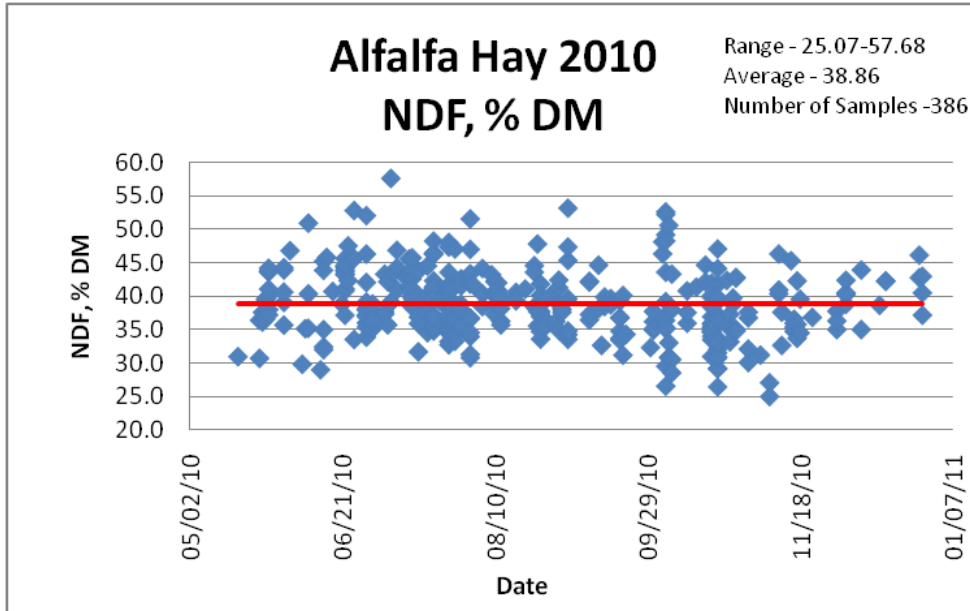
The most important factors affecting forage quality are forage species, *stage of maturity at harvest*, and *harvesting and storage methods*. Secondary factors that influence forage quality are fertilization of the soil, temperatures during forage growth, and variety.

In the majority of situations, neutral detergent fiber (NDF) content and NDF digestibility are the major factors determining intake and digestibility in lactating dairy cattle. The NDF content in a lactating dairy cattle diet affects fill in the rumen. In diets formulated with high NDF content, fill becomes a limiting factor of dry matter intake (DMI). If diets are formulated with low NDF content, cows regulate intake to meet energy requirements. True digestibility of other nutrients such as protein and fat tend to be high (~98%) for the majority of feedstuffs fed to lactating dairy cattle. However, the digestibility of NDF can be variable (40 to 70%). As a plant matures, the NDF content increases and the NDF digestibility decreases. Therefore, the stage of maturity at which a plant is harvested is critical to the quality of the forage.

How does Forage Quality affect Milk Production?

Statistical analyses of multiple research trials have been summarized over the years evaluating the effect of NDF content and NDF digestibility of lactating dairy cattle rations on DMI and milk production (Dado and Allen, 1996; Oba and Allen, 1999; Mertens, 2006). Results from the research summary by Mertens (2009) suggests that *for every percentage unit change in 48 hour in vitro NDF digestibility (IVNDFD 48h) in the forage would increase fat corrected milk by 0.15 lbs/day and DMI by 0.08 lbs/day*. This is based on forage supplying 30% of the NDF in the ration. Data from the same regression equations suggest that *for every percentage unit decrease in forage NDF content, fat corrected milk would increase by 0.35 lb/day and DMI would increase by 0.18 lbs/day*. This is, also, based on forage supplying 30% of the NDF in the ration. The majority of lactating dairy cattle rations are formulated to supply between 30 to 50% of the NDF from forages. The effects of forage NDF content and NDF

digestibility on DMI and milk production would be greater as the amount of NDF from forage increased in the diet.



The graph above shows the range in NDF content of the alfalfa hay samples submitted last year to Ag Health Labs. The lowest NDF content of alfalfa hay was 25% and the highest NDF content was 58%. This is a range in NDF content of 33 percentage units. If the low and high NDF content were used to calculate a difference in milk production potential between these 2 forages, it could result in an increase of approximately **11 lbs of milk** being produced per cow per day by using the alfalfa hay with the lower NDF content, assuming that NDF content from the alfalfa hay made up approximately 30% of the total ration NDF. The lower NDF digestibility in the higher NDF (~58% NDF) alfalfa hay would have the potential to reduce milk production by up to **3 lbs of milk/day** based on the regression equations of Mertens (2009). Mertens's (2009) regression equations suggest that the NDF content of the forage has a 2 to 3 fold greater effect on milk production than NDF digestibility.

Set time aside this spring to evaluate your forage crop program. Look for ways to improve upon what you are currently doing to maximize forage quality. Ask your nutritionist, agronomist, veterinarian, seed providers, and other industry or university professionals for information and guidance about your forage crops.

Evaluating your forage program and being prepared for the growing season will pay off!

Lynn VanWieringen and Fred Muller

References:

Dado, R.G., and M.S. Allen. 1996. Enhanced intake and production of cows offered ensiled alfalfa with higher neutral detergent fiber digestibility. *J. Dairy Sci.* 79:418-428.

Mertens, D.R. 2006. Do we need to consider NDF digestibility in the formulation of ruminant diets? 27th Western Nutrition Conf., Sept. 19-20, Winnipeg, Manitoba p. 75-98.

Mertens, D.R. 2009. *WCDS Advances in Dairy Technology.* 21:191-201.

Oba, M., and M.S. Allen. 1999. Evaluation of the importance of the digestibility of neutral detergent fiber from forage: Effects on dry matter intake and milk yield of dairy cows. *J. Dairy Sci.* 82:589-596.