

NIRS Forage and Feed Testing Consortium NEWS

August 2006



Dedicated to Increasing the Accuracy and Knowledge of NIRS Testing.

<http://www.uwex.edu/ces/forage/NIRS/home-page.htm>

NIRSC Projects Progress

This year after our February annual conference, several project committees were appointed or continued from last year. Two are highlighted here. For a table of all projects and list of each committee, please see **NIRSC Projects and Committees 05-06** below.

The Quality Assurance group has made good progress since February. The group intends to produce a document addressing the issues of sample handling and use. An opening statement will describe the goals of the NIRSC on this topic as well as what the document hopes to achieve. After this, each step of sample handling and use will be addressed. Reliance on existing documents will be done where possible. The

group wants to define as many ways as possible that labs can empower themselves on QA issues. For example, an NFTA sample monitoring project (see later in this newsletter), NIRSC posting spectra on our website for labs to utilize in their own testing, and a tutorial on how to handle internal check cells are all methods for labs to take responsibility for their own QA. The goal of the group is to have the document available by the next annual conference.

The other group making great progress is the Calibration & Standardization committee. Currently the group is looking into adding the starch parameter to the fermented corn silage equation and sugar to the



grass equation. Interest from membership has been expressed on both of these parameters. Background and feasibility is being reviewed for sugar and final recommendations on method for starch is being determined. The group has also implemented a formal structure for completing NIRSC equations updates annually. This structure relies upon membership, NIRSC personnel, and reference chemistry labs to all communicate effectively and meet deadlines. A description of this timeline structure is later in this newsletter.

If you have any comments for any of the committees, please feel free to contact that committee.

Equations Language

Understanding terms related to the NIRSC equations is important so that we are all talking about the same thing. Here are some terms that you will or have already seen lurking around the equations documentation.

Version: We are using the term "version" in the same way that software programs do. A version refers to a revision of software. In our case, it refers to an equation update. For example, we released updates of the commercial equations this April, so these are the April 2006 versions of each equation. We will also have updates this fall, so these will be the October 2006 versions.

Variant: The term "variant" refers to the same software release (= the same version) with several different capabilities. NIRSC has 3 variants to its equations. Variant I = Basic and produces DM, ADF, NDF, CP, minerals, RFV. Variant II = Basic + digestible fiber + RFQ + ash. Variant III = Basic + variant II + RUP.

Fee Packages: Fee package is a term that we use to describe how we group chemical analysis that we charge a fee for, above the Basic. Basic equations come with NIRSC membership. Fee packages are Variant II and Variant III of the equations.

Commercial Equations: Commercial equations are the most common type of equation that NIRSC works on. These are the hay, haylage, grass, etc. equations. These equations are typically what the commercial laboratories use in every day analysis.

Seed Breeder Equation: We currently have one seed breeder equation for fresh clipped alfalfa. This equation was developed by a group of seed researchers within the NIRSC membership and is owned by them. These seed researchers update the equation annually and share in its cost.

Small Group Equations: Currently we have one equation under this category: an unfermented corn silage equation. The way that this equation was developed and is updated is done in the same way as the seed breeder group. Participants shared in the cost of development and will share annually in the cost of update.



For further information on any of these topics, please contact Patty Laskowski.

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Equations Timeline

Each group of equations noted above (commercial, seed breeders, and small group), has a specific timeline for completion.

Understanding these timelines will help members participate and get their samples represented in the NIRSC equations.

Commercial Equations:

- 4-1-06: If needed, identify specific equations & parameters to target for update, otherwise plan on all being updated
- 5-1-06: All new spectra & chemistry collected/ sample selection completed
- 6-1-06: Announce to members need for physical samples from selection
- 7-1-06: All physical samples collected from selected samples
- 7-15-06: All physical samples delivered to reference lab

- 9-1-06: All data from reference lab to Paolo and Alistair
- 10-1-06: EQUATIONS RELEASED TO MEMBERSHIP

Seed Breeders' Equation: (for 2006 samples)

- Feb-06: Identify specific equations & parameters to target for update
- 5-1-06 through 9-1-06: All new spectra collected/ sample selection completed
- 5-1-16 through 9-1-06: Announce to members need for physical samples from selection
- 10-1-06: All physical samples collected from selected samples
- 10-2-06: All physical samples delivered to U of MN (1st reference lab)
- 10-10-06: U of MN begins running chemistry at latest
- 11-10-06: all chemistry complete at U of MN and samples returned to Alistair

- 11-15-06: samples delivered to UW Soil & Forage Lab (2nd reference lab)
- 12-15-06: All data from both reference labs to Paolo and Alistair
- 4-1-07: EQUATION RELEASED TO PARTICIPANTS

Small Group Equations: Unfermented Corn Silage

- Feb-06: Identify specific equations & parameters to target for update
- 4-1-06: All new spectra
- sample selection completed
- 5-1-06: Announce to members need for physical samples from selection
- 6-1-06: All physical samples collected from selected samples
- 6-15-06: All physical samples delivered to reference lab
- 8-1-06: All data from reference lab to Paolo and Alistair
- 9-1-06: EQUATION RELEASED TO PARTICIPANTS

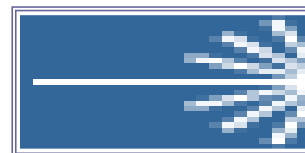
NFTA Samples for Quality Monitoring

Alistair has developed a quality assurance process using NFTA samples. Members would record their NFTA results in a table provided to them. Then Alistair would compile and analyze the data. All labs' submissions would be confidential and a lab's identity would only be available to Alistair. Any summary of results would code lab identity and preserve anonymity.

The goals of this project are:

1. To determine how consistent NIRSC labs are in their predictions -what statistics to use, and just on the average for a lab per samples or the tree replicates reported?
2. To determine whether an equation could perform better on certain samples and/or DM, CP, ADF or NDF prediction
3. To determine whether NIRSC members perform better on average than non-members on NFTA samples. This would require the cooperation of the NFTA, particularly a willingness to share either raw data (unlikely) or a summary of non-member labs' scores. This would give an impression of any difference, but not the ability to statistically test whether members perform better than non-members.

TDN Equations Users Report



NIRSC members may wonder how the pricing structure and for fee equations (= the TDN equations) is working out for them. This year we produced an invoice different from those in the past because this is the first time we have calculated in usage fees and rebates. The for fee equation invoices have 3 components: usage count from the previous year, rebates from spectra and chemistry submitted, and sign up for TDN equations.

Currently we have 15 of our 30 members using the TDN equations. Here are some examples that represent the range and variety of TDN equation use among NIRSC members.

Small users are able to use the packages economically especially with rebates:

Example #1:

user count: 1800 = user fee of \$450
spectra/chem. rebate = \$1000
new sign up hay/hlg & cs = \$1000
total bill = \$450

Example #2:

user count: 300 = user fee of \$75.00
no spectra/chem. so rebate = \$0
new sign up hay/hlg & cs = \$1000
total bill = \$1075.00

Large users can use rebates to make the fees more economical:

Example #3:

user count 16,000 = user fee max. of \$2000
spectra/chem. rebate = \$500
new sign up hay/hlg & cs = \$1000
total bill = \$2500

Example #4:

user count >8000 = user fee max. of \$2000
no spectra/chem. so rebate = \$0
new sign up hay/hlg & cs = \$1000
total bill = \$3000

In example #1, the cost per sample is \$.25 total. In example #3 the cost per sample is \$.16 total. By submitting samples and maximizing rebates, all of the NIRSC benefits.

What Kind of Spectra Are We Looking For?

Many NIRSC members have been sending in spectra for selection for years. We have a broad base of general samples in our equations. But now our equations are becoming somewhat more "mature" and it is important to know what to send in and what will get you credit in the TDN equations rebate program.

Here's what to send in:

1. Outlier samples with a $GH > 3.0$ or $NH > 0.6$,
2. Samples from unusual growing conditions such as drought, nutrient deficiency, disease, etc.,
3. Samples from an uncommon source that would not be well represented by the current equation, even if the H-statistics look normal. These might include BMR corn silage or less common varieties such as TEF grass that we talked about at the annual conference.

NIRSC Projects & Committees 05-06

Project	Objectives	Committee
Quality Assurance	review issues and recommend actions that relate to the quality and accuracy of NIRSC products and processes	Seth Willis, Doug Harland, Kelli Conway, Alistair Carr, Patty Laskowski Chair: Seth Willis
NIRSC Intellectual Property	establish protection for NIRSC property and certainty of ownership with existing projects	Chuck Kahl, David Johnson, Dan Undersander, Don Meyer
Classes of NIRSC Membership	define membership categories for membership campaign	Paul Peterson, Seth Willis, Sam Stratton, Patty Laskowski
NIRSC/AFAC	detail how to partner these two organizations	Don Sapienza, Don Meyer, Seth Willis, Dave Taysom
Calibration & Standardization Oversight	organize NIRSC equation processes, follow up on parameters of interest to membership, develop member participation	Don Sapienza, Chuck Kahl, Alistair Carr, Patty Laskowski
Finance	oversee budget development, advise on purchases & expenses to follow budget	Dan Undersander, Neal Martin, Dave Taysom, Chuck Kahl, Patty Laskowski
Executive	set goals and vision for NIRSC, follow up and take action on special NIRSC issues, follow and make recommendations for NIRSC personnel progress	Don Sapienza, David Johnson, Chuck Kahl, Dan Undersander, Neal Martin Chair: Don Sapienza
Instrument	oversee interaction and development of process between NIRSC and instrument companies	Don Sapienza, Dan Undersander, David Johnson, Neal Martin, Alistair Carr, Patty Laskowski
White Paper	completion of white paper	Don Sapienza, Neal Martin, Dave Taysom
DM Group	at USDFRC level	Dave Mertens, Alistair Carr
NIRSC Nutrition Advisory Committee	advise NIRSC on nutrition issues to focus on	Tim Snyder (main contact), Dave Mertens, Mike Hutjens, Jim Linn, Randy Shaver, Larry Chase, Peter Robinson, Paolo Berzaghi, Mary Beth Hall, Bill Weiss, Pat Hoffman