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Rock River Laboratory, Inc. is offering NDF Digestibility using a new and improved method. The new method is the Combs-Goeser method and is described below. We will not drop the former method from our reports but will give you both. The previous results will be listed on our reports as the "Traditional" NDFd, while the new method will be the "Standardized" NDFD. We will also be offering a new package. NDF Digestibility Profile will use NIR or wet chemistry Standardized NDFd 24, 30, and 48 hour results to develop a digestion profile for your sample. From the curve, digestibility at any time point between 24 and 48 hours can be seen.

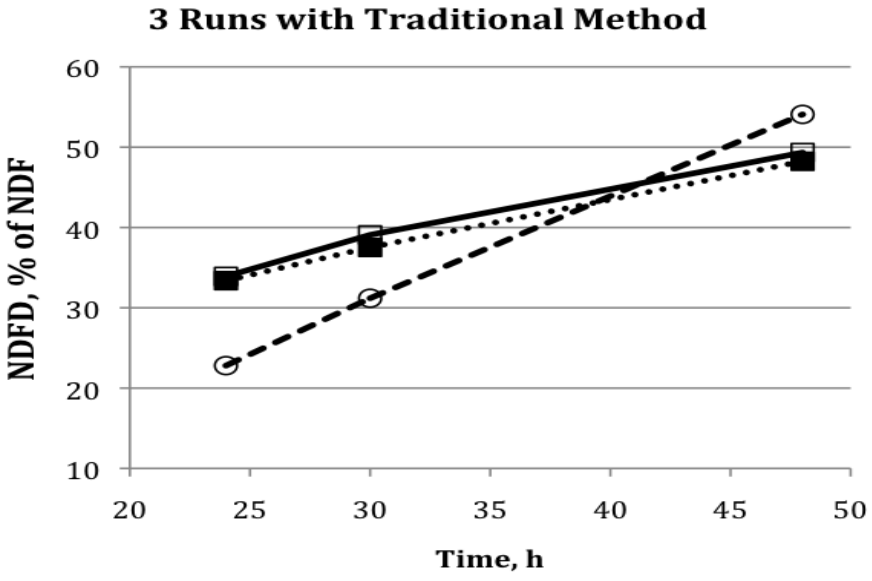
Combs-Goeser in vitro NDF Digestibility (CGNDFD) Information Sheet

What is it?

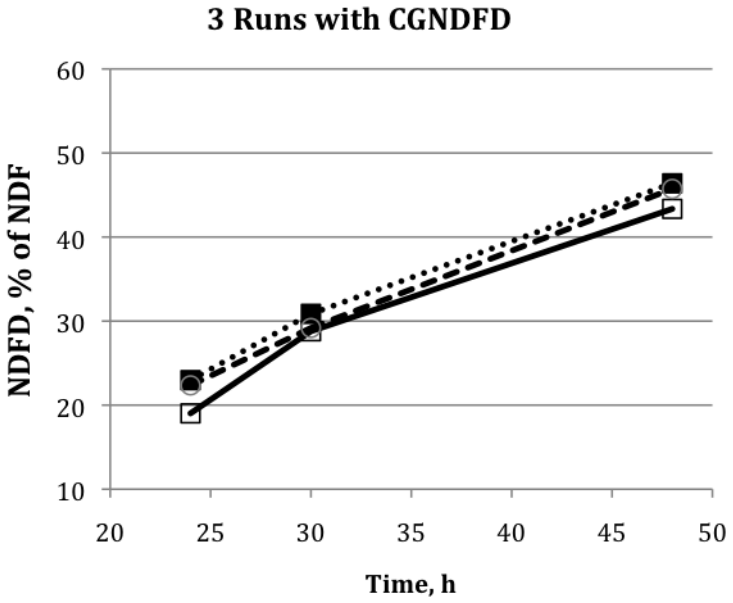
- New standardized wet chemistry 24, 30 and 48 h *in vitro* NDFD assay with 10-fold reduction in error compared to a traditional NDFD method

Why is it better than Traditional Wet Chemistry Assays?

- The 24, 30, and 48h CGNDFD values offer improved precision from run to run
- The rumen fluid used in the technique is standardized prior to each run, which is different from traditional methods
- Results from three different runs (in different weeks) will be closer with CGNDFD compared to a traditional wet chemistry method



Source: **Improvement of the Rumen Fluid Priming Method for Measuring *in vitro* NDF Digestibility. 2008.** J.P. Goeser, P. C. Hoffman, and D. K. Combs. J Dairy Sci. Abstract. **Comparison of Means and Run to Run Variation of *in vitro* NDFD Between Two Labs Using Different *in vitro* NDFD Techniques. 2008.** J.P. Goeser, L. M. Bauman, P. C. Hoffman, and D. K. Combs. J Dairy Sci. Abstract.



Frequently Asked Questions:

What do these CGNDFD values mean?

- Preliminary studies indicate the CGNDFD values are comparable to actual 24, 30, and 48 h rumen NDFD and 48 h CGNDFD values are also similar to actual total-tract dairy cattle NDFD measurements from 20 published research papers* (20 study average = 47.3 % NDFD).

How can I use these values?

- The 48 h CGNDFD values can be used as a more precise measure of NDF digestion and can be used in NRC calculations. The precise 24 and 30 h CGNDFD measurements can be used to estimate the NDF digestion profile.

***Studies Summarized by Goeser and Combs (unpublished data)**

Bernard et al. 2002. J Dairy Sci. 85:2277-2282.
Bowman et al. 2002. J Dairy Sci. 85:3420-3429
Broderick et al. 2002. J Dairy Sci: 85:1894-1901
Cooke et al. 2008. J Dairy Sci. 91:2417-2422
Cozzi et al. 2005. Italian J Anim Sci. 4:211-221
Dado and Allen. 1996. J Dairy Sci. 79:418-428
Kammes et al. 2008. J Dairy Sci. 91:3138-3144
Krause and Combs. 2003. J Dairy Sci. 86:1382–1397
Krause et al. 2002. J Dairy Sci. 85:1936-1946
Krause et al. 2003. J Dairy Sci. 86:1341-1353
Llamas-lamas and Combs. 1990. J Dairy Sci. 73:1069-1080
Poore et al. 1993. J Dairy Sci. 76:2235-2243
Poore et al. 1993. J Dairy Sci. 76:2244-2253
Ruiz et al. 1995. J Dairy Sci. 78:305-319
Stensig and Robinson. 1997. J Dairy Sci. 80:1339-1352
Trater et al. 2001. J Anim Sci. 79:1346-1351
Valadares et al. 2000. J Dairy Sci. 83:106-114
Voelker et al. 2008. J Dairy Sci. 91:2694-2701
Weiss. 1995. J Dairy Sci. 78:1802-1814
Yansari et al. 2004. J Dairy Sci. 87:3912-3924

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Comparison of Means and Run to Run Variation of *in vitro* NDFD Between Two Labs Using Different *in vitro* NDFD Techniques. 2008. J.P. Goeser, L. M. Bauman, P. C. Hoffman, and D. K. Combs. J Dairy Sci. Abstract.

Combs-Goeser in vitro NDFD (CGNDFD) NIRS Package Information Sheet

What is it?

- New NIR package for measuring 24, 30, and 48 h CGNDFD for grass and legume samples with more precision than other NIR packages

Whys is it better?

- CGNDFD NIR statistics offer greater precision than other NIR packages:
  - CGNDFD 48 h dNDF (% of DM) NIR equation offers 40, 11, 26, and 11% improvement in SEC, R^2, SECV, and 1-VR values compared to NIRS Consortium 2007 equation statistics (See table)
- CGNDFD NIR package offers similar precision for 24, 30, and 48 h measurements
- First direct 24, 30, and 48 h NDFD NIR measurements available (R^2 approximately 0.90 or greater for each time point)
  - Other NIR packages calculate NDFD using dNDF predictions

CGNDFD NIR Equations Statistics: Grass/Legumes				
Item	**SEC**	**R^2**	**SECV**	**1-VR**
48 h dNDF, % of DM	1.16	**0.97**	1.55	0.95
NIRS Consortium Equation (2007) Statistics: Mixed Hay and Mixed Silage				
48 h dNDF, % of DM	2.01	**0.92**	2.20	0.90
48 h dNDF, % of DM	1.84	**0.83**	1.99	0.81

Frequently Asked Questions:

What samples can be analyzed with CGNDFD NIR?

- At this time grass, legume and grass-legume mixtures can be analyzed can be analyzed.
- Corn silage NIR equations are being developed, but are not available at this time.

Why is the CGNDFD NIR precision better?

- NIR equations are only as good as the wet chemistry assay used to create them. The CGNDFD wet chemistry method offers greatly improved precision, and the NIR equations reflect the improved precision.

Source: **Improvement of the Rumen Fluid Priming Method for Measuring *in vitro* NDF Digestibility. 2008.** J.P. Goeser, P. C. Hoffman, and D. K. Combs. J Dairy Sci. Abstract.
Comparison of Means and Run to Run Variation of *in vitro* NDFD Between Two Labs Using Different *in vitro* NDFD Techniques. 2008. J.P. Goeser, L. M. Bauman, P. C. Hoffman, and D. K. Combs. J Dairy Sci. Abstract.