Corn Silage Quality: How is it Defined and Measured

From a Nutritionist’s Point of View

Dr. Karl E. Nestor Jr.
Senior Nutritionist
Mycogen Seeds
Defining Corn Silage Quality:

- Yield
- Agronomics
- Traits
- Nutritional Parameters
Corn Plant

- **Grain**
  - 40-45% of plant DM

- **Fodder**
  - 55-60% of plant DM
    - Leaves = 15%
    - Stem = 20-25%
    - Cob, Shank, Husk = 20%

- **Starch**
- **NDF**

*There is a wide variation in Corn Silage Hybrids*
Take Home Point #1

- Don’t Judge Corn Silage Hybrids on Yield Alone
  - Consider Nutritional Factors
Nutritional Parameters:

- Starch
- Fiber Digestibility
Starch

- Starch is highly digestible
- Physical protection

Usage is highly dependant on:
- Kernel Maturity (Dry Matter)
- Kernel Particle Size
- Endosperm Type
Predicted Total Tract Starch Digestibility
Shaver, 2002

*Based on data of Bal et al., 2000; Dhiman et al., 2000; Rojas-Bourrillon et al. 1987
Endosperm Type

Floury

Vitreous
Kernel Vitreousness & Ruminal *In Situ* Starch Availability

Correa et al., JDS, 2002
Vitreousness increases with increasing DM

Philippeau and Michalet-Doreau, 1997
Fiber Digestibility

- Measured as NDF Digestibility
  - Highly variable
  - Range of Values

30% to 75%

Marshfield Lab data, 2004
Why Fiber Digestibility?

- Michigan State Research
  - 1 unit increase in NDF digestibility:
    - Increase in DMI
    - Increase milk production 0.55 lb.
Modern BMR Milk Production
Research

Increase in milk production per day of cows receiving BMR versus Control

University
Samples Analyzed for DNDF

Ward, 2009 ADSA
Take Home Point #2

- Look Closely at NDF Digestibility When Judging Corn Silage on Nutritional Value
Key Points about NDF Digestibility

- Hybrids should differ by 4 to 5 points before you will notice a milk production response.

- When analyzing, use consistency:
  - Similar RM’s
  - Many different labs and methodologies
  - Consistent time points
Silage Evaluation Methods

- Milk per Ton
- Milk per Acre
- MILK95, MILK2000, MILK2006
  - http://www.foragelab.com/resources/feedReports.cfm
- Corn Picker
  - www.msu.edu/~mdr/cornpicker.html
Your Ultimate Quality Evaluator
Thank you for your attention