

Feeding 2003 Forages to Dairy Cattle

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2003 was a very variable year in terms of moisture and temperature and the effects it had on forage crop yield and quality. Late spring and early summer was generally wet with normal temperatures followed by increasingly dry conditions and temperatures as summer progressed. August was one of the driest on record; matching that of the severe drought in 1976. Thus, dairy producers and livestock farmers in many cases have minimal forage inventories with unknown feeding values as they go into the winter of 2003/2004.

Effects of Environment on Forage Quality

General effects

- Maturity is the most important factor influencing forage quality
- High temperatures increase plant maturation and decrease leaf/stem ratio in alfalfa
- Moderate water deficiency stress tends to delay or slow maturation

Alfalfa (Buxton, D.R., 1996. Animal Feed Science and Technology 59:37-49)

- Optimal growth temperature is about 68° F.
- High temperatures increase maturation, reduce sugars and reduce leaf/stem ratios.
- High temperatures increase NDF and lignification. For every 2° F above optimum, DM digestibility decreases 0.3 to 0.7% units.
- Moderate water stress may increase digestibility by slowing down the maturation process, increasing leaf/stem ratios, decreasing NDF and overall increasing DM digestibility because of increased leaf content.
- Conclusions: Look for good quality in alfalfa hay and haylages that escaped rain damage in early summer. Late summer alfalfa also should be of good quality as moisture stress delayed maturation. Yields were reduced however.

Corn silage (Van Soest, P.J., 1996. Cornell Nutrition Conference)

- Effects of moisture and heat stress are less well known than for alfalfa.
- As corn plants develop, sugars are converted into starch, protein, cell walls and lignin.

- Conflicting data between Michigan and New York as to the effects of water deficiency and stress on corn plant composition. New York data indicates water deficiency should increase digestibility of both DM and NDF, but water stress is 5 to 8 times more influential on plant quality than growing degree days. Michigan, however, indicates temperature is the most negative factor influencing forage quality.
- The water stress and high humid temperatures at or above the optimum of 86 – 95° F for corn plant growth has increased NDF and lowered starch content and decreased both NDF and starch digestibility.

Corn silage Quality – What can be expected?

- Starch and sugar content will be highly variable ranging from slightly less than normal (29% starch; 4% sugar) to probably less than half normal silage values.
- Corn test weight will be lower, but corn in the 50 to 58lb/bushel range should not feed different if fed on a weight basis. Very low test weight corn, less than 50lb/bushel will have a lower energy content than normal (10 -20 % less).
- Fiber (NDF) and lignin will be higher than normal (37-42% NDF and 2 – 3% lignin) and NDF digestibility will be less than optimal (>65%).
- Moisture content of silage is likely to be less than the 68 - 65% optimum. Dry silages will:
 - Not pack as well into storage resulting in less fermentation, poor preservation, and a greater chance of developing molds or yeasts.
 - Tend to have a longer, larger particle or more ragged chop with stringy leaves and stalks than silage chopped at the right moisture level.
 - Have a fluffier feeding characteristic.

Early Feeding Experiences with 2003 Corn silage

- Cows are not milking on this year's silage. Sounds like a common theme every fall, but milk production on many farms is down 5 to 10lb/cow from last year.
- Observations made on farms:
 - Milk components (fat and protein) are high.
 - Cows have high DM intakes, but production doesn't match.
 - Cows have low DM intake, milk production matches.
 - Inconsistency in manure and with undigested fiber particles.
 - Feeding mycotoxin binders (bentonite or aluminum silicates) has had no effect.
 - No response in milk production to increasing corn grain or digestible fiber sources in the diet.
 - Reducing forage NDF in the diet doesn't change intake or milk production.

Considerations for improving the feeding value of 2003 Corn Silage

- Add some soluble sugars (1-2lb/cow) to the diet to increase palatability and rumen available carbohydrate.
- Replace some of the corn silage with digestible fiber sources (excellent hay, beet pulp, soyhulls, gluten feed, and corn distillers grain). Forage NDF in the diet can be as low as 18% if NFC levels are held under 40%.
- Watch out for sorting in the bunk as cows root through and leave the larger corn silage particles for grain.
- Be sure there is adequate protein in the diet (17 - 19% CP lactation diets) for optimal fiber digestion in the rumen.
- Add fat to the diet. Studies at Minnesota have shown the best milk production with high corn silage feeding (>65% of the forage DM) occurs when diets contain 22 – 24% forage NDF and .5 to 1lb/cow/day of rumen undegradable fat was fed.