Cost Effective Balancing of Yield and Quality with Forages

Dr. Dan Undersander
University of Wisconsin
Milk Production with Varying Levels of Grain and Alfalfa Forage Quality

- 4% fat corrected milk (lb/day)
- Prebloom, Early bloom, Mid bloom, Full bloom
- 20% Concentrate
- 37% Concentrate
- 54% Concentrate
Yield of three vs four cuttings of alfalfa
Yield of three vs four cuttings of alfalfa

32% Yield Reduction
Yield of three vs four cuttings of alfalfa

- 3 cuts by Sept 1
- 4 cuts by Sept 1
- 3 cuts by Aug 15, Oct 1
- 3 cuts by Sept 1, 1 early

Yield t/a DM

[Graph showing yieldcomparison]
Alfalfa Growth Each Day after Cutting

![Graph showing daily growth of alfalfa over days after cutting. The graph indicates an initial growth phase, a phase of rapid growth, and a phase of deceleration in growth, peaking around day 15-20 and then declining slightly.]
Crude Protein Change over Time, 2007

The graph shows the change in crude protein over time from May 8 to June 17, 2007. The y-axis represents Crude Protein in % DM basis, ranging from 10 to 30. The x-axis represents dates from May 8 to June 17. The data points are scattered, and a trend line is fitted with the equation:

\[ y = -0.3232x + 12701 \]

The coefficient of determination, \( R^2 \), is 0.7101, indicating a moderate to strong correlation between the variables.
Alfalfa RFV loss with Advancing Maturity in the Spring
Change in fiber digestibility over time

\[ y = -0.40x + 16 \]

\[ R^2 = 0.66 \]
Comparison of RFV to RFQ for 3 Wisconsin Counties, 2006 and 2007

\[ Y = 1.34x + 14.33 \quad R^2 = 0.96 \]

\[ Y = 1.20x + 36.88 \quad R^2 = 0.99 \]
Alfalfa Digestion

Comparison of 24 to 48 hour In Situ NDF of alfalfa Digestion

\[
 y = 0.949x + 6.2257 \\
 R^2 = 0.9018
\]
Effective Balancing of Yield and quality

- Feed the lowest quality necessary for performance
Forage Quality Needs of Cattle

- Dairy, 1st trimester
- Dairy Calf
- Dairy, last 200 days
- Heifer, 3-12 month
- Stocker cattle
- Heifer, 12-18 mo
- Beef cow & calf
- Heifer, 18-24 mo
- Dry cow

<table>
<thead>
<tr>
<th>Relative Forage Quality</th>
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<tr>
<td>100</td>
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Effective Balancing of Yield and quality

- Feed the lowest quality necessary for performance
- If both grower and dairyman, benefit to quality in milk production
Effective Balancing of Yield and quality

- Feed the lowest quality necessary for permanence
- If both grower and dairyman, benefit to quality in milk production
- If grower selling to dairyman – consider value of quality
Effective Balancing of Yield and Quality

Parameters

- Yield change/day: 100 lb
- RFV change/day: 5
- $/RFV: $1.00
- Cost to harvest additional ton: $15.00
What can Grower Do to Decrease Production Cost?
What can Grower Do to Decrease Production Cost?

- Maximize yield

![Graph showing yield decrease over time](image-url)
What can Grower Do to Decrease Production Cost?

- Maximize yield
- Harvest for quality
- Timely Harvest
What can Grower Do to Decrease Production Cost?

- Maximize yield
- Harvest for quality
  - Timely Harvest
  - Multileaf neutral
What can Grower Do to Decrease Production Cost?

- Maximize yield
- Harvest for quality
  - Timely Harvest
  - Multileaf neutral
- Minimize ash

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<tr>
<th>Ash Content of Forage Samples</th>
<th>Type</th>
<th>Statistic</th>
<th>% Ash</th>
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What can Grower Do to Decrease Production Cost?

- Maximize yield
- Harvest for quality
  - Timely Harvest
  - Multileaf neutral
- Minimize ash
  - Cutting height
  - Knife angle
  - Hay on stubble
  - Raking

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What can Grower Do to Decrease Production Cost?

- Maximize yield
- Harvest for quality
  - Timely Harvest
  - Multileaf neutral
  - Minimize ash
- Storage
  - Who stores?
  - Minimize Loss
New Traits for Forage Quality

- Low lignin alfalfa
- High bypass protein alfalfa
- Biomass
  - Separate leaves and stems
Questions or comments?
Short cutting cycle - Alfalfa yield from 21 and 35 day mowing

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