Corn Silage Audits – Lessons from Observing Harvest

Jennifer Heguy – UC Cooperative Extension
Merced, Stanislaus & San Joaquin Counties
2014 Corn Silage Audit

- Dairies selected to participate in this study had previously taken part in a corn silage management survey in 2013.

- Corn silage harvest on 20 San Joaquin Valley dairies were evaluated in the summer of 2014.
Objectives

- To observe ensiling practices,
- To obtain information on current corn ensiling practices, and
- To determine corn silage processing score (CSPS) on harvested forage in the San Joaquin Valley.
2013 Corn Silage Survey

• 138 dairies utilized custom choppers
  – 87% were satisfied with processing
  – 13% felt it needed improvement or was not satisfactory.

• 92.5% of dairies (n=134) reported monitoring kernel processing during harvest.
2014 Corn Silage Audit

- Silage structure type, delivery rate, number of packing tractors, and use of a custom chopper were recorded.

- Five consecutive truckloads of delivered fresh chopped forage were sampled and composited.

- Composited samples were sent to a commercial laboratory for nutrient analysis, and analyzed for corn silage processing score (CSPS).
# Corn Silage 2014

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herd Size</td>
<td>350</td>
<td>5,250</td>
<td>1800</td>
</tr>
<tr>
<td>Structure Type</td>
<td></td>
<td>Wedge (n)</td>
<td>Bunker (n)</td>
</tr>
<tr>
<td># Packing Tractors</td>
<td></td>
<td>Delivery Rate (minutes)</td>
<td>8 – 40</td>
</tr>
<tr>
<td>1 (n=12)</td>
<td></td>
<td>10 – 64</td>
<td></td>
</tr>
<tr>
<td>2 (n=7)</td>
<td></td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>3 (n=1)</td>
<td></td>
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2 dairies did not use a custom chopper.
Nutrient composition of chopped corn (n=20)

<table>
<thead>
<tr>
<th></th>
<th>DM</th>
<th>CP</th>
<th>ADF</th>
<th>NDF</th>
<th>Starch</th>
<th>NFC</th>
<th>Ash</th>
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<tbody>
<tr>
<td><strong>AVG</strong></td>
<td>35.9</td>
<td>7.7</td>
<td>24.4</td>
<td>41.0</td>
<td>30.2</td>
<td>43.6</td>
<td>5.4</td>
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<tr>
<td><strong>MEDIAN</strong></td>
<td>35.9</td>
<td>7.8</td>
<td>24.9</td>
<td>42.3</td>
<td>29.0</td>
<td>43.2</td>
<td>5.4</td>
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<tr>
<td><strong>MIN</strong></td>
<td>31.2</td>
<td>6.2</td>
<td>20.2</td>
<td>35.2</td>
<td>23.3</td>
<td>36.6</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>MAX</strong></td>
<td>40.3</td>
<td>8.8</td>
<td>28.3</td>
<td>46.7</td>
<td>36.7</td>
<td>50.7</td>
<td>6.8</td>
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<tr>
<td><strong>STD</strong></td>
<td>2.5</td>
<td>0.6</td>
<td>2.1</td>
<td>2.8</td>
<td>3.6</td>
<td>3.1</td>
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Kernel Processing

Kernel Processing Improves:

- Handling and Packing
- Starch Digestion
- Fiber Utilization
- Feed Intake
- Reduces Feed Sorting

Too Much Processing:

- Decreases effective fiber
- Favors rapid fermentation -> rumen acidosis

Too Little Processing:

- Kernels lost in feces
- Difficult Packing
- Sorting increased
Corn Silage Processing Score

What does it measure?

Coarse Fraction > 4.75mm:
Fiber will stimulate chewing activity.
Starch will be poorly digested.

Fine Fraction < 1.18mm:
Fiber may not contribute to chewing activity or physical effectiveness.

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<th>Starch (%) passing through the coarse screen</th>
<th>Ranking</th>
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<td>&gt; 70%</td>
<td>Optimum</td>
</tr>
<tr>
<td>50 -70%</td>
<td>Average</td>
</tr>
<tr>
<td>&lt; 50%</td>
<td>Inadequate Processes</td>
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• No samples were inadequately processed (CSPS <50%)
In the 2013 survey, ~75% reported waiting less than 6 weeks prior to beginning feedout.
On Farm Monitoring

Evaluate the Broken Kernels

Separate kernels in a bucket of water

Guidelines:

- 90 - 95% cracked
- 70% smaller than ¼ of a kernel

Nicking and Crushing is not enough

(Mertens, 2005)
Suggested Monitoring

Hourly. Sample a truckload of forage for:

1. DM

2. Length of cut

3. Kernel Processing
   - Checking the degree of kernel processing on-farm, throughout harvest, will allow for improvements in kernel processing.
   - Due to the large range in CSPS observed, hourly inspection of the delivered material and open communication with the chopper to meet harvesting goals is recommended.
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