Retaining Forage Quality with Round Bale Silage

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Missouri’s Hay Dilemma

Mechanical Handling Losses when Harvesting Hay

- Mowing
- Tedding
- Raking
- Baling or Chopping
- Handling

Round Bale Silage (Wrapped Baleage)

Replaces the capital cost of a hay barn
Lower initial cost than a conventional silage system
Lower harvest losses than hay
- Shortens field time avoiding rain events and leaf loss
Higher quality feed
- Does not enhance but preserves feed quality

Key Factors

- Quality at time of harvest
  - Baleage only preserves and does not really enhance forage quality
- Suitability of forage for ensiling
- Harvest and preservation techniques
- Storage methods

Making Good Round Bale Silage

Wilt forage to 50 to 60% moisture – upper end for grasses – lower end for legumes
Make bales as dense as possible
- Longer fiber slows fermentation
Wrap as quickly as possible
- Within 5 hours of baling

- KEEP THE OXYGEN OUT!
Moisture Testing

- Moisture Meter
- Microwave

Moisture Content at Baling (%)

Crude Protein (%)

Pre-Storage  Post-Storage

Red Clover Round Bale Silage

<table>
<thead>
<tr>
<th>Treatment</th>
<th>CP</th>
<th>NDF</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC baleage</td>
<td>21.1</td>
<td>35.7</td>
</tr>
<tr>
<td>RC hay</td>
<td>16.3</td>
<td>49.8</td>
</tr>
</tbody>
</table>

(R60% moisture at baling)

Ryegrass Baleage Comparison to Hay

<table>
<thead>
<tr>
<th>Treatment</th>
<th>CP</th>
<th>TDN</th>
<th>RFQ</th>
<th>ADG lbs/hd/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryegrass Hay</td>
<td>14.7</td>
<td>62.4</td>
<td>133</td>
<td>1.26 b</td>
</tr>
<tr>
<td>Ryegrass Baleage</td>
<td>16.3</td>
<td>65.9</td>
<td>174</td>
<td>1.94 a</td>
</tr>
<tr>
<td>Bermuda Hay</td>
<td>16.1</td>
<td>62.9</td>
<td>116</td>
<td>1.56 b</td>
</tr>
</tbody>
</table>

Replacement Heifers Gain – No additional supplementation
Ryegrass hay received a light rain shower on it
Unpublished data, Calhoun, GA, 2009, Dennis Hancock

P<0.10

Several types of wrappers are available

Platform Wrappers

- Features:
  - Trailer or 3-point hitch
  - Round or square bales
  - Tractor hydraulics or gas engine
  - Plastic $3.50 - $4.50/bale for 4 layers
  - Some have a loader arm – most can be loaded with a front-end loader
Platform Wrappers

Concerns:
- Plastic cost
- Labor per bale
- Most only accommodate four ft. wide bales

Baler – Wrapper Combination

Round Bale Silage Transport

- Avoid handling if possible
- If bales must be moved, use a grapple to avoid puncturing plastic

Square Bale Platform Wrappers

In-Line Wrappers

Features:
- Bales end-to-end
- Less labor for wrapping
- Lower plastic cost (1/2 or less)

In-Line Wrappers

Concerns:
- Uniformity of adjacent bales (both size and density)
- End of rows need to be sealed by hand
- A hole in the plastic can spoil a large area
Round Bale Silage - Wrapping

- Wrap with at least four layers of 1-mil plastic with 50% overlap. 8 mil total is ideal for long-term storage. 4-6 layers are ideal.
- Use high-quality plastic

Crops to Wrap

Legumes
- Alfalfa
- Red clover
- Soybean
Cool Season Grasses
- Tall fescue
- Wheat / Triticale / Rye
- Annual Ryegrass
Warm Season Grasses
- Forage sorghum
- Sudangrass
- Pearl millet
- Immature corn

Grasses vs. Legumes

- Grasses tend to ferment better than do legumes – more water-soluble carbohydrates
- pH near 4 for all grass treatments
- Much more acid production than in alfalfa silage

When to Wrap

Wrap as soon as possible after baling

Definitely on the same day – Start a little on the wet side

Delayed wrapping prevented adequate fermentation as reflected in the higher pH value

Suggestions:
- Hot, summer day – 2 hrs
- Cool, fall day – 8 hrs
  (Depends on weather and type of forage)

2013 SW Center Demonstration

Dr. Rob Kallenbach

Alfalfa Silage & Hay

Alfalfa silage & hay from the same field
2, 4, or 6 layers of stretch film – platform wrapper
Approximately one year after harvest

<table>
<thead>
<tr>
<th>Storage Treatment</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 layers</td>
<td>53%</td>
</tr>
<tr>
<td>4 layers</td>
<td>84%</td>
</tr>
<tr>
<td>6 layers</td>
<td>88%</td>
</tr>
<tr>
<td>Hay</td>
<td>64%</td>
</tr>
</tbody>
</table>
Disadvantages of Round Bale Silage

1. Some balers cannot easily handle wilted forage
2. Silage bales can be heavy
3. Plastic wrap material can tear or puncture, leading to spoilage
4. Disposal of used plastic

Let's hear from a farmer who has made this work.

Gene Kinslow