Use of Alternative feedstuffs in Cow Calf Operations

Glenn Nader, UCCE Farm Advisor
Yuba/Sutter/Butte Counties
Energy
Dry Matter
Protein
Corn

- $180 to 205/ton – whole
- Feeders
- CP 9.8%
- TDN 89%
- 1 lb. corn-Spare 2 lbs of alfalfa and 3 grass

Management
- 2-week step-up period
- Whole corn
- A minimum of 30 inches of linear bunk space per cow
- Feeding an ionophore
- Feed cattle at the same time every day
Cost of energy (TDN) for cattle based on hay price, corn price and hay quality.

<table>
<thead>
<tr>
<th>Ton</th>
<th>Corn $/Ton of TDN</th>
<th>Low Quality Hay(^a) $/Ton of TDN</th>
<th>Avg Quality Hay(^b) $/Ton of TDN</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>56</td>
<td>109</td>
<td>93</td>
</tr>
<tr>
<td>60</td>
<td>66</td>
<td>130</td>
<td>111</td>
</tr>
<tr>
<td>70</td>
<td>78</td>
<td>152</td>
<td>130</td>
</tr>
<tr>
<td>80</td>
<td>88</td>
<td>174</td>
<td>148</td>
</tr>
<tr>
<td>90</td>
<td>100</td>
<td>196</td>
<td>167</td>
</tr>
<tr>
<td>100</td>
<td>110</td>
<td>217</td>
<td>185</td>
</tr>
<tr>
<td>110</td>
<td>122</td>
<td>239</td>
<td>204</td>
</tr>
</tbody>
</table>

\(^a\)46 percent TDN

\(^b\)54 percent TDN

When low quality grass hay can be purchased for $50 per ton, the cost for energy from corn would be approximately equal when corn is priced at $100 per ton. In the case of the high quality hay example, energy from corn would cost the same at approximately $85 per ton.
Corn to Spare Hay

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Gestation</th>
<th>Early Lactation</th>
</tr>
</thead>
<tbody>
<tr>
<td>---------------------------------------</td>
<td>-----------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Grass Hay&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Corn Grain</td>
<td>9.0</td>
<td>12</td>
</tr>
<tr>
<td>Protein supplement (38-44% )</td>
<td>2.0</td>
<td>3</td>
</tr>
<tr>
<td>Limestone&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.2</td>
<td>.25</td>
</tr>
</tbody>
</table>

<sup>a</sup>Hay = 89% dry matter, 5% crude protein and 48% TDN. Quantity of hay fed daily can be gradually reduced to around 4 pounds if whole shelled corn is fed. If processed corn is fed, begin feeding .75% of body weight and gradually reduce to .5%.

<sup>b</sup>Limestone is a calcium source and is not required if protein supplement contains at least 2.5% calcium.
Rice Bran

- Brown to white rice - polished
- $160 to 200/ton
- CP 14%
- TDN 76%
- Phos 1.67%
- Fat 13%
- More than 20% - fiber digestion
- Rancid in warm weather
Rice Bran - Supplement

- Salt to control intake
- 50% to start
- Salt increases water consumption
Almond Hulls

- Depends on what is sent – shell, trigs
- CP - 4.2
- TDN - 54
- $135-145/ton
- Electric fence and move each day
Canola Meal

- Trans fat and biodiesel
- Canada Unit trains
- Pellets
- Jan 7 price $368 Portland
- 4-8% dairy rations

<table>
<thead>
<tr>
<th></th>
<th>TDN</th>
<th>NE-L</th>
<th>CP</th>
<th>Fat</th>
<th>ADF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canola Meal</td>
<td>75</td>
<td>0.77</td>
<td>39</td>
<td>3.9</td>
<td>19</td>
</tr>
</tbody>
</table>
Roughages
Cull Fruits and Vegetables

- High moisture - limit nutrient content
- Seasonal supply
- Summer squash
- Ag bag
Rice Straw

- Lab testing
- Minimum criteria
  - ADF – 50 or lower
  - CP 4.5 or higher
  - 10- 13% moisture (Not Dairy)
  - Only 31.4 percent of samples met these guidelines
- http://www.ricestrawmarket.org/
### Crude Protein of Rice Straw for three years

<table>
<thead>
<tr>
<th>Year</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55</td>
</tr>
<tr>
<td>2003</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td></td>
</tr>
</tbody>
</table>

**Diagram:**
- **2002** (■)
- **2003** (□)
- **2008** (▲)
ADF of Rice Straw for three years

Observations

Percent

2002
2003
2008
Feeding Rice Straw to Cattle

DANIEL J. DRAKE, University of California Cooperative Extension Livestock Farm Advisor, Siskiyou County; GLENN NADER, University of California Cooperative Extension Livestock and Natural Resources Farm Advisor, Sutter/Yuba/Butte Counties; LARRY FORERO, University of California Cooperative Extension Livestock and Natural Resources Farm Advisor, Shasta and Trinity Counties.

Feed is the largest single cost of producing beef. Producers who have access to alternative feeds often have economic advantages due to the lower costs of production. However, alternative feeds can present challenges due to variable consistency, variable supply, potential toxicants, and unusual composition. Rice straw, a by-product of the rice grain industry in Northern California, is a potential alternative feed for cow and calf producers. Increasing regulations and restrictions on burning rice straw has stimulated interest in using it for other purposes, including cattle feed.

Because rice straw has limited nutritive value (low crude protein and digestibility), it should be used only as a replacement for part of the forage in a ration. It should not be used as a complete ration. Studies of feeding rice straw have shown mixed results, depending on the quality of the straw and how it was used in the ration (see Garret 1978; Garrett and Dunbar 1992; Hull et al. 1972; Nader 1999, 2000; Nader et al. 1998). Poorer animal performance has usually occurred when rice straw was the only feed.

KEYS TO MAKING RICE STRAW WORK IN YOUR CATTLE FEEDING OPERATION

- Make sure the rice straw was baled within 10 days of harvest.
- Test the rice straw for crude protein and ADE preferably before purchase.
- Determine what other feeds or supplements will have to be provided to meet the nutritional needs of animals.
- Compare costs of feeding options or alternatives.
Rice straw

- Order in July
Corn Stover

- Limited corn production this year
- Feeders
- Varies in value
  - CP – (3.7 to 5.2)
  - TDN - (49 to 54)
- Dirt
- Nitrates
## Corn Stover or Stocks

**NO3-N -> 1500 to 4500 = Caution**

### Corn Stover Analysis Results

<table>
<thead>
<tr>
<th></th>
<th>DM</th>
<th>CP</th>
<th>TDN</th>
<th>NO3-N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>85.8</td>
<td>3.7</td>
<td>53.4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>82.1</td>
<td>4.5</td>
<td>52.5</td>
<td>1270</td>
</tr>
<tr>
<td>3</td>
<td>84.6</td>
<td>5.1</td>
<td>54.3</td>
<td>1560</td>
</tr>
<tr>
<td>4</td>
<td>77.8</td>
<td>5.2</td>
<td>49.8</td>
<td>750</td>
</tr>
<tr>
<td>5</td>
<td>84.8</td>
<td>3.9</td>
<td>55.2</td>
<td>705</td>
</tr>
</tbody>
</table>

**Average**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DM</td>
<td>83.02</td>
<td>CP</td>
<td>4.48</td>
<td>TDN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>53.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1071</td>
</tr>
</tbody>
</table>

All results are reported on a Dry Matter basis.
Almond Shell

- Low digestibility
- Impaction problems
  - Green grass
  - Prune pumice
Bean Straws

- Higher protein (6-10%)
- Baled dry – sticks and power
- Cows adapt to eating it
- Some on drip beds – soil compaction
## Comparison

<table>
<thead>
<tr>
<th></th>
<th>Crude Protein</th>
<th>ADF</th>
<th>Ash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn Stover</td>
<td>5.9</td>
<td>46</td>
<td>5.8</td>
</tr>
<tr>
<td>Rice Straw</td>
<td>4.5</td>
<td>48</td>
<td>16.6</td>
</tr>
<tr>
<td>Lima Bean Straw</td>
<td>7.6</td>
<td>39</td>
<td>9.3</td>
</tr>
<tr>
<td>Wheat Straw</td>
<td>3.6</td>
<td>52</td>
<td>7.2</td>
</tr>
<tr>
<td>Kidney Bean Str</td>
<td>9.9</td>
<td>43</td>
<td>10.4</td>
</tr>
</tbody>
</table>

Source - By-Products and Unusual Feedstuffs in Livestock Rations Western Regional Extension Publication, No. 39
Alfalfa

- Perfect protein supplement
- Feed every other day
  - Maintain constant rumen protein levels
- Price against supplement
  - Labor
Rice Straw Haylage

- 50-60% moisture bale
- Snow peas
By-Products and Unusual Feedstuffs in Livestock Rations.
Western Regional Extension Publication No. 39, October 1980.
22 pages