Where Does Oilseed Meal Fit in Livestock Feeding Systems?

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Focus for discussion:

- Beef cows
- Stocker cattle (young and growing)
- Oilseed meal supplements for low-quality forage diets
Oilseed meals

- Clockwise from top
  - Canola meal
  - Camelina meal
  - Canola meal
  - Soybean meal

www.soygrowers.com
What is a low-quality forage?

- Generally
  - Less than 7% crude protein
  - Protein is the first limiting nutrient with low-quality forages
  - Forages below this threshold will usually require supplementation
- Will PNW oilseed meals work?
# Chemical composition of some oilseed meals in the PNW

<table>
<thead>
<tr>
<th>Component (% of DM)</th>
<th>Commercial Canola meal</th>
<th>On-farm Canola meal</th>
<th>On-farm Camelina meal</th>
<th>Commercial soybean meal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude protein</td>
<td>39.9</td>
<td>27.8</td>
<td>37.1</td>
<td>51.6</td>
</tr>
<tr>
<td>NDF</td>
<td>25.4</td>
<td>33.8</td>
<td>22.3</td>
<td>8.9</td>
</tr>
<tr>
<td>ADF</td>
<td>19.7</td>
<td>29.3</td>
<td>14.7</td>
<td>5.7</td>
</tr>
<tr>
<td>Ash</td>
<td>8.7</td>
<td>6.8</td>
<td>6.6</td>
<td>8.0</td>
</tr>
<tr>
<td>TDN</td>
<td>72.5</td>
<td>75.4</td>
<td>77.7</td>
<td>80.1</td>
</tr>
<tr>
<td>Crude fat</td>
<td>3.4</td>
<td>18.3</td>
<td>12.8</td>
<td>1.0</td>
</tr>
</tbody>
</table>

What stands out when comparing the composition of the meals?
Question

• What nutrients are available in oilseed meals that make them attractive for cattle supplementation?
• In the context of low-quality forages, which one is most important?
• Protein
Supplementation

- When we feed beef cows, are we feeding the “cow” or the “bugs”?

Answer:

THE BUGS!

(the rumen microbes have nutrient requirements just like the cow)
Correcting for nutritional imbalances with oilseed meals

- **Supplementation:**
  - Provision of feed in addition to available forage or harvested feed to address nutritional deficiencies
    - Microbial deficiencies
    - Host deficiencies
  - Ruminally degradable protein *vs.* ruminally undegradable protein (RDP *vs.* RUP) in oilseed meals
How do oilseed protein supplements work?

- Protein supplements stimulate the rumen microbes
  - Increase in forage intake
  - Increase in forage digestion

- In total, deliver more energy to the animal
  - Very efficient
What about the fat content?

- **When is fat a good thing?**
  - Deliver more energy
  - Reproductive benefits
- **When is additional fat not so good?**
  - Long chain fatty acids are inhibitory to fiber digestion
    - physical barriers
    - chemical barriers
- **Some products protect fat to get it into the small intestine for digestion**
Efficiency of oilseed meal supplementation

Effect of protein and energy supplementation on weight gains of steers grazing native range (July 16 to October 20; SBM-based supplement)

<table>
<thead>
<tr>
<th>Item</th>
<th>Control</th>
<th>0.8 lb/day of 39% CP</th>
<th>1.4 lb/day of 43% CP</th>
<th>3.1 lb/day 10% CP, corn-based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight gain lb/day(^b) (96 days)</td>
<td>1.44</td>
<td>1.88</td>
<td>1.97</td>
<td>1.78</td>
</tr>
<tr>
<td>Lb of supplement/lb of added gain</td>
<td>0.0</td>
<td>1.8</td>
<td>2.8</td>
<td>8.8</td>
</tr>
</tbody>
</table>

\(^a\)Supplements fed 3 days/week;
\(^b\)Control vs. all supplementation treatments (\(P<0.05\))

(Adapted from Lusby et al., 1982)
Our ongoing oilseed research

• Evaluation of Canola and Camelina meals as protein supplements for beef heifers
• Chemical composition and *in situ* degradability of on-farm processed Canola and Camelina meals
Other uses for oilseed meals

- High performance diets
  - Beef feedlot
  - Dairy
  - Swine
  - Poultry
Thank You!

Any Questions?