Using Distillers Grains in the Dairy Ration

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Introduction

- Distillers grains is a good energy and protein feed source to include in livestock rations.
- Several different terms will be used throughout this presentation:
  - CDG: Corn Distillers Grains
  - DDG: Dried Distillers Grains
  - DDGS: DDG + Solubles
- This presentation will review the results of recent research at SDSU and elsewhere with feeding distillers grains, both wet and dried, to dairy cattle.
**The Composition of Distillers Grains**

<table>
<thead>
<tr>
<th>Item</th>
<th>% of DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Protein</td>
<td>30-36</td>
</tr>
<tr>
<td>RUP, % of CP</td>
<td>47-57</td>
</tr>
<tr>
<td>$\text{NE}_L$, Mcal/lb</td>
<td>1.00</td>
</tr>
<tr>
<td>Fat</td>
<td>9.8</td>
</tr>
<tr>
<td>ADF</td>
<td>19.0</td>
</tr>
<tr>
<td>NDF</td>
<td>38.0</td>
</tr>
<tr>
<td>Ca</td>
<td>0.15</td>
</tr>
<tr>
<td>P</td>
<td>0.83</td>
</tr>
</tbody>
</table>
Protein in Distillers Grains

- > 30% of DM; more than old “book values”
  Similar for DDG & DDGS
- Good source of Ruminally Undegradable Protein (~55% RUP)
  RUP is slightly less for wet vs. dried DG
- Protein quality:
  Fairly good quality
  Lysine is the first limiting amino acid
Production Response When Fed CDG

- The same as\textsuperscript{1,2,3} or greater\textsuperscript{4} than when fed SBM
- Increased\textsuperscript{4} or no change\textsuperscript{5} when supplemented with RPLM
- Similar to when fed a blend of protein supplements (SBM, FM, CDG)\textsuperscript{5}

\textsuperscript{1} Schingoethe et al., J. Dairy Sci. 66:345, 1983 (Wet CDG)
\textsuperscript{2} Schingoethe et al., J. Dairy Sci. 82:574, 1999 (Wet CDG)
\textsuperscript{3} Owen & Larson, J. Dairy Sci. 74:972, 1991 (Dried CDG)
\textsuperscript{4} Nichols et al., J. Dairy Sci. 81:482, 1998 (Dried CDG)
\textsuperscript{5} Liu et al., J. Dairy Sci. 83: 2075, 2000 (Dried CDG)
Whiskey or Fuel Ethanol Distillers Grains?¹

When fed DDGS from Whiskey or Fuel Ethanol Plants:
* Similar milk production whether DDGS was from whiskey or ethanol manufacturing
* Higher production than when fed SBM
* If DDGS was dark (heat damaged?), production was the same as when fed SBM

¹ Powers et al., J. Dairy Sci. 78:388, 1995
Determining the Energy Value of Wet Corn Distillers Grains
Energy in CDG

- Today’s CDG contains 7-11% more energy than “book values”

  \[DE = 1.84 \text{ Mcal/lb vs. } 1.72\]
  \[ME = 1.64 \text{ Mcal/lb vs. } 1.53\]
  \[NE_L = 1.00 \text{ Mcal/lb vs. } 0.90\]

Wet vs. Dried CDG

- Nutrient content of DM is the same for both
- Considerations with wet CDG:
  1) Can usually store only 5-7 days
  2) May need preservatives (e.g. propionic acid or other organic acids, etc.)
  3) Limited economical hauling distances
  4) Rations may be too wet which could limit total DM intake, especially if ensiled forages are also fed
Current Research to Increase the “Shelf Life” of Wet CDG

- Storage in silo bags
  
  *K. Tjardes & C. Wright, SDSU, 2001*

- Blend with soyhulls
  
  *K. Kalscheur & A. Garcia, SDSU, 2001*

- Preservatives
  
  *Various industry groups*
How Much CDG Can be Fed?

- Recommend max. of ~20% of ration DM
  e.g. ~10-13 lb/d of Dried; ~30-40 lb/d of Wet
  Usually no palatability problems
  Can usually formulate nutritionally balanced diets

- At 30% of DM:
  May decrease DMI, especially if Wet CDG
  May feed excess protein
**Example Ration Considerations**

- Diets containing 50:50 forage:concentrate
  1) If equal proportions of Alfalfa & Corn Silage: *CDG can replace most or all protein suppl.*
  2) If mostly corn silage: *More CDG can be fed but may need some other protein supplement, check Lys, & P*
  3) If mostly alfalfa: *Less CDG likely needed to supply diet CP*
Other Corn Products as Feeds

- **Corn Gluten Meal**
  
  *High Protein (60%) & High RUP (55% of CP)*

- **Corn Gluten Feed**
  
  *Med. Protein (25%), Low RUP (25% of CP), Good Energy (\(NE_L = 0.86 \text{ Mcal/lb}\))*

- **Corn Distillers Solubles**
  
  *Med. Protein (18% CP), Good Energy (21% EE; \(NE_L \approx 0.91 \text{ Mcal/lb}\)), Often blended with CDG as CDG+Solubles*
Conclusions

- CDG is a good protein and energy feed to include in rations of dairy cattle.
- The nutrient content of the dry matter in CDG is essentially the same for both wet & dried CDG.
- The nutrient content is similar for CDG & DDGS although DDGS contains more P.
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