Experiences With Developing a Commercial Swine Feeding Program Utilizing DDGS

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DDGS Presentation Outline

- Who is Land O’Lakes?
- Background
  - Product Availability
  - Value of DDGS for Swine vs. other species
- Factors Influencing Value of DDGS in Swine Diets
  - Nutrient Content
  - Product Variation
  - Price
  - Other Factors
- Closeouts from Commercial Units Using DDGS
- Market Positioning
Who is Land O’Lakes?

• National food and agricultural cooperative
• Owned by >7,000 producer members and 1,300 local community cooperatives
• Land O’Lakes provides member co-ops:
  – Feed
  – Seed
  – Plant food
  – Crop protection products
Who is Land O’Lakes?

- Headquarters in Arden Hills, Minnesota
- Annual sales > $6 Billion (2001)
- >6,000 employees
- Process >10 Billion pounds milk annually
- Market >300 Dairy Products worldwide
- In U.S., #1 marketer of branded butter and deli cheese.
Who is Land O’Lakes?

• Purina Mills is part of our system in the U.S.

• Leading Manufacturer in North America of:
  – Dairy, beef and swine feed
  – Alfalfa seed
  – Plant and crop protection products
LongView Animal Nutrition Center

• 1,188 acre Research Farm
• 45 min. west of St. Louis, MO
• R&D for: Dairy, swine, beef, horse, dog, cat, rabbit, deer, lab animal (mice, rats, and ferret) feeds.
• **Focus**: New products and cutting edge technology.
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Distiller’s Dried Grains with Solubles
Potential use of DDGS

(Land O’ Lakes 2002)
DDGS: USDA Reported Prices vs. Theoretical Nutritional Value

(Sparks Study funded by Land O’ Lakes, 2003)
DDGS Value Comparison

<table>
<thead>
<tr>
<th>Assumptions:</th>
<th>Dairy Lactation</th>
<th>114.24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn $2.00 / bu</td>
<td>Poultry Finisher</td>
<td>100.09</td>
</tr>
<tr>
<td>SBM $175.00 / ton</td>
<td>Layer Diet</td>
<td>104.66</td>
</tr>
<tr>
<td>Urea $360.00 / ton</td>
<td>Swine G-F Diet</td>
<td>96.34</td>
</tr>
<tr>
<td>Non-ruminant diets corn/SBM</td>
<td>Beef Feedlot</td>
<td>108.00</td>
</tr>
<tr>
<td>Ruminant diets typical diets with competing by-products.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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DDGS – A Concentration of Nutrients in Corn:

- 56 pounds of corn.
- Remove the starch.
- Contains remnants of enzymes and yeast added for fermentation.
- Non-Starch nutrients concentrated into 17-18 pounds of DDGS
**DDGS Value Comparison:**

<table>
<thead>
<tr>
<th></th>
<th>DDGS (NRC)</th>
<th>“New Gen” DDGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME, kcal/lb</td>
<td>1,282</td>
<td>1,452</td>
</tr>
<tr>
<td>C. Protein, %</td>
<td>27.7</td>
<td>26.9</td>
</tr>
<tr>
<td>C. Fat, %</td>
<td>8.4</td>
<td>9.7</td>
</tr>
<tr>
<td>Lysine, %</td>
<td>.62</td>
<td>.76</td>
</tr>
<tr>
<td>Dig. Lys., %</td>
<td>.29</td>
<td>.40</td>
</tr>
<tr>
<td>P, %</td>
<td>.77</td>
<td>.79</td>
</tr>
<tr>
<td>Av. P, %</td>
<td>.59</td>
<td>.63</td>
</tr>
</tbody>
</table>
Assumptions:
Corn = $1.99/ bu
Hi-Pro SBM = $142.60/ ton
L-Lysine.HCl = $90/ cwt
No added fat

<table>
<thead>
<tr>
<th>Shadow Price of NRC vs “New Generation” DDGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRC DDGS</td>
</tr>
<tr>
<td>Shadow Price $86.98/ton</td>
</tr>
<tr>
<td>Amount Used 33 lb/ton</td>
</tr>
<tr>
<td>Price to Use 200 lb/ton</td>
</tr>
</tbody>
</table>
### Assumptions:
- Corn = $1.99/bu
- Hi-Pro SBM = $142.60/ton
- L-Lysine.HCl = $90/cwt
- No added fat

### NRC vs “New Gen” DDGS at Current DDGS Mkt Price

<table>
<thead>
<tr>
<th></th>
<th>NRC DDGS</th>
<th>“New Gen” DDGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDGS Price</td>
<td>$83.60/ton</td>
<td>$83.60/ton</td>
</tr>
<tr>
<td>Amount Used</td>
<td>56 lb/ton</td>
<td>200 lb/ton</td>
</tr>
<tr>
<td>Diet Cost ($92.50 CSBM)</td>
<td>$92.43/ton</td>
<td>$91.98/ton</td>
</tr>
</tbody>
</table>
DDGS Collected Over Time from One South Dakota Plant

• Variable products
  – Lysine: .78% (average of 11 samples)
  – Ranged from .65 to .97% lysine

• If mycotoxins in corn, still present in DDGS

Thaler, 2002
Growth Rate of Pigs Fed 3 Blends of DDGS

Cromwell et al., 1993
Sources of Variation

1. Quality of grain
2. The fermentation process
3. Percent of the soluble production blended with the wet grains during the drying process
DDGS Protein (As-Fed Basis) by Plant

Sample Date

Protein, %


WIL
MCI
WCH
DDGS Lysine at Plant “A”

Plant “A” DDGS

- Average = .73%
- Minimum = .70%
- Maximum = .77%
- Std Dev. = 0.02
DDGS Lysine at Plant “B”

Plant “B” DDGS
• Average = .76%
• Minimum = .66%
• Maximum = .82%
• Std Dev. = 0.04
DDGS Lysine at Plant “C”

Plant “C” DDGS

• Average = .80%
• Minimum = .69%
• Maximum = .88%
• Std Dev. = 0.04
## Value of Using 200 lb/ton of New Generation DDGS

<table>
<thead>
<tr>
<th>Ingredient Prices</th>
<th>$/ton</th>
<th>$/bu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>71.07</td>
<td>1.99</td>
</tr>
<tr>
<td>Hi-Pro Soybean Meal</td>
<td>142.60</td>
<td></td>
</tr>
<tr>
<td>Monocalcium Phosphate, 21%</td>
<td>217.00</td>
<td></td>
</tr>
<tr>
<td>DDGS (New Generation)</td>
<td>83.60</td>
<td></td>
</tr>
<tr>
<td>Limestone</td>
<td>28.00</td>
<td></td>
</tr>
</tbody>
</table>

Savings from using 200 lb DDGS: $0.44/ton

Break-Even Price for DDGS: $88.01/ton DDGS
Other Factors Influencing Use of DDGS:

• Manure Management:
  – Increased phosphorus and nitrogen an issue
  – Trace minerals also concentrated
    • Significance?
• Dried products required in most feeding systems for non-ruminants
• Mycotoxins can survive process
• Bulk density, micron size, and flowability
• Pellet durability – when applicable
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Practical Products for DDGS

• Higher Calcium, lower Phosphorus premix
• Lowers cost of supplementation
• Environmentally-friendly
• Added lysine &/or phytase further reduces protein and phosphorus
Grow-Finish Pigs Fed Diets Containing DDGS

<table>
<thead>
<tr>
<th></th>
<th>No DDGS</th>
<th>10% DDGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pigs in</td>
<td>993</td>
<td>988</td>
</tr>
<tr>
<td>Pigs Out</td>
<td>979</td>
<td>971</td>
</tr>
<tr>
<td>Daily Gain, lb</td>
<td>1.63</td>
<td>1.62</td>
</tr>
<tr>
<td>Feed:Gain</td>
<td>2.75</td>
<td>2.74</td>
</tr>
<tr>
<td>Feed cost, $/hd</td>
<td>$32.69</td>
<td>$32.53</td>
</tr>
</tbody>
</table>

Source: Land O’Lakes Farmland Feed
Recent Closeout Summaries:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5290 pigs on 10% DDGS Rations:</td>
<td></td>
</tr>
<tr>
<td>Average Daily Gain</td>
<td>1.61</td>
</tr>
<tr>
<td>Feed Conversion</td>
<td>2.76</td>
</tr>
<tr>
<td>Feed Cost/Pound Gain</td>
<td>$0.16</td>
</tr>
<tr>
<td>% Culls</td>
<td>0.80%</td>
</tr>
<tr>
<td>Cull Avg. Wt.</td>
<td>109.65</td>
</tr>
<tr>
<td>Death Loss %</td>
<td>2.73%</td>
</tr>
<tr>
<td>Average Daily Consumption</td>
<td>4.45</td>
</tr>
</tbody>
</table>
### Close out performance 10% DDGS diets:

**Fall 2003**

<table>
<thead>
<tr>
<th></th>
<th># in</th>
<th># out</th>
<th>Wt in</th>
<th>Wt out</th>
<th>DL</th>
<th>ADG</th>
<th>F/G</th>
<th>ADC</th>
<th>Days</th>
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</thead>
<tbody>
<tr>
<td><strong>Farm 1:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Averages</td>
<td></td>
<td></td>
<td>58.7</td>
<td>253.0</td>
<td>3.35</td>
<td>1.71</td>
<td>2.79</td>
<td>4.79</td>
<td>113</td>
</tr>
<tr>
<td>Total head</td>
<td>24,676</td>
<td>23,852</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Farm 2:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Averages</td>
<td></td>
<td></td>
<td>47.2</td>
<td>265.2</td>
<td>2.88</td>
<td>1.75</td>
<td>2.86</td>
<td>5.00</td>
<td>124</td>
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<tr>
<td>Total head</td>
<td>8,798</td>
<td>8,545</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Farm 3:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Averages</td>
<td></td>
<td></td>
<td>51.5</td>
<td>259.2</td>
<td>2.33</td>
<td>1.74</td>
<td>2.76</td>
<td>4.82</td>
<td>119</td>
</tr>
<tr>
<td>Total head</td>
<td>13,887</td>
<td>13,563</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
+11,000 pigs yield & lean data from 2002
Incorporated 10% DDGS in diets mid-year
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DDGS for Swine

- Competitive price
- Increasing availability
- Improved quality, consistency
- Observed health benefits
DDGS Market Positioning

• Understand the product

• Appropriately position DDGS by species
DDGS Market Positioning

• Feed Sales force understands ingredient well enough to help livestock producers realize benefit and to make best use of related feed products
• DDGS marketer helps direct DDGS to most appropriate end-user
• DDGS producer and end-user benefit from utilizing comparative nutritional value of DDGS
Land O’ Lakes Feed
DDGS Marketing

• The growth of the dry-mill ethanol industry provides marketing opportunity for DDGS.
• LOL Feed is actively involved in marketing ethanol co-products for ethanol plants.
• LOL Feed has a staff of full-time DDGS marketers led by National DDGS Marketing Director, Jim Jolly.
Summary – Feed Perspective

• Corn DDGS is an excellent feed ingredient
• Quality of Corn DDGS has Improved with New Generation Plants.
• Increased supply of DDGS has made it cost competitive (including nonruminants)
• Other co-products compete for space in rations.
• Product consistency and uniformity is an important issue
• Rapid lab analysis has been beneficial
For more information about DDGS from Land O’ Lakes Feed contact:

• Land O’ Lakes Feed DDGS Marketing:
  Jim Jolly
  800-333-9774
  651-765-5658
  jdjolly@landolakes.com

• Land O’ Lakes Feed DDGS technical support:
  Dr. Harold Tilstra
  507-283-4198
  Hdtilstra@landolakes.com

  Dr. Kevin Herkelman
  651-765-5522
  klherkelman@landolakes.com