Hawkeye: Leading an Energy Revolution
Iowa Ethanol production

- There are currently 28 ethanol plants in Iowa producing 2.2 billion gallons of ethanol annually.
- There are 14 ethanol plants under construction in Iowa that will produce 1.4 billion gallons of ethanol annually.
- There are numerous other plants being talked about not yet officially recorded.

- With the 28 current ethanol plants in production, this equates to about 6.1 mmt of DDGS production annually.
- With the 14 plants expected to come into production over the next few years, this equates to about 3.9 mmt of DDGS production (using a yield of 2.75 gallons per bushel and 17 lbs of DDGS per bushel).

So over the next couple years, Iowa stands a good chance of nearly doubling its current capacity both in ethanol and DDGS production.
National Ethanol production

- There are currently 147 ethanol plants producing 8.6 billion gallons of ethanol annually.
- There are 48 new plants under construction and 7 plants in expansion expected to produce 5.1 billion gallons of ethanol annually.
- The 147 plants in production equates to 24.1 mmt of current DDGS production.
- The plants under construction/expansion equates to almost 13.8 mmt of added production.
- Total DDGS production has the potential to reach about 38 mmt.

(using a yield of 2.75 gallons per bushel and 17 lbs of DDGS)
**U.S. DDGS Supply Analysis**

**Current Production**: 147 plants producing 8.522 bln gallons and consuming 3.1 bln bu of corn (using 2.75 yield)

**Future Production**: 55 plants will produce 5.1 bln gallons and consume 1.8 bln bu of corn (using 2.75 yield)

Source: Renewable Fuels Association
Future Supply

US DDGS Production (dry weight) including Exports

- Total DDGS
- Exports

Courtesy Pro Exporter Network
Demand Side Inclusion rate assumptions

- Inclusion rate assumptions come from Dr. Harold Tilstra with Land ‘O Lakes feeds
  - Feedlot Cattle – 40%
  - Beef Cows – 30%
  - Dairy – 10%
  - Finisher Pigs, Breeding Sows – 10%
  - Poultry – 10%
- Above inclusion rates are considered industry standard
## Demand Potential

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>Demand Potential (mmt)</th>
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<tr>
<td>Poultry</td>
<td>Broilers</td>
<td>4.044 mmt</td>
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<tr>
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<td>Turkeys</td>
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<td></td>
<td>Layers</td>
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<td>Total</td>
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<tr>
<td>Swine</td>
<td>Slaughter</td>
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<td></td>
<td>Breeding</td>
<td>0.417 mmt</td>
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<td>Total</td>
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<td>Cattle</td>
<td>Dairy</td>
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<td>Fed Cattle</td>
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<td></td>
<td>Beef Cows</td>
<td>8.891 mmt</td>
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<td>Total</td>
<td>30.440 mmt</td>
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Total Demand Potential (mmt) – 39.226 mmt
U.S. DDGS Supply/Demand Analysis

Demand Potential

Poultry: (Broilers-8.9 bln consuming 1 lb DDGS) (Turkeys-543 mln consuming 2 lbs DDGS) (Layers-343 million consuming 8.7 lbs per year)

Swine: (Slaughter-109 mln consuming 55 lbs) (Breeding-6 mln consuming 150 lbs/yr)

Cattle: (Dairy-8.4 mln head consuming 4.2 lbs/day) (Cattle on Feed-26.1 mln head consuming 1320 lbs total) (Beef Cows-32.6 mln head consuming 600 lbs total)

Source: USDA
Supply vs. Demand Summary

- Total Potential Supply - ~38 mmt
- Total Potential Demand – 39.223 mmt
U.S. DDGS Supply/Demand Analysis

Total Supply/Demand

Supply

Demand

2005-06

2007-2008
Domestic Market: USA

- ~90% (~14.5 million MT)
  - Beef & Dairy Cattle: ~75%
  - Swine: ~20%
  - Poultry: ~5%

Source: Renewable Fuels Association
Current U.S. Distillers Grains Usage

Beef Cow Concentration
Potential DDGS Demand – selected states

Top 8 States utilizing distiller's grains for BEEF CATTLE...

Source: USDA/NASS
Current U.S. Distillers Grains Usage

Dairy Cow Concentration
Potential DDGS Demand - selected states

Top 6 States utilizing distillers grains for Dairy CATTLE

1.220

MID-CO COMMODITIES, Inc.

Source: USDA/NASS
DDGS EXPORTS TO THE WORLD

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<tr>
<th>Year</th>
<th>Value</th>
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<tr>
<td>2006</td>
<td>1200000</td>
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<tr>
<td>2007</td>
<td>2400000</td>
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<tr>
<td>YTD 2008</td>
<td>1300000</td>
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Legend: World Totals
WHERE DO U.S. DDGS GO?

2007

- Latin America: 893,469
- Asia: 631,208
- Europe: 267,708
- Med Basin & Africa: 246,573

Hawkeye Renewables
2007 TOP EXPORT MARKETS

- Mexico: 708216
- Canada: 317580
- Turkey: 136519
- Taiwan: 134404

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Alternative DDGS Uses

- **Food use**

- **Fertilizer use**
  - Current conversion of the protein, phosphorous, and potassium in DDGS converts to about a 4-1-1 for N-P-K values – which is low.

- **Fuel use**
  - Studies show burning DDGS produces about 5,000 btu/lb
  - Equals 10 mmbtu/ton or 3.2 mmbtu for a typical 100 million gallon facility
  - At $8.50 mmbtu nat gas costs, equals $27,200,000 – equivalent of $85/ton DDGS.
  - 100 million gallon facility uses about 3.4 mmbtu per year if drying all co products to DDGS
  - Environmental costs??
  - Initial equipment costs??
  - Increases feed vs. fuel debate??

- **Other uses??**
Marketing DDGS – Opportunities with DDGS

Before we can truly realize all the potential demand across the US and around the world, we need to understand the opportunities with DDGS.

Opportunities
- Lack of standardized testing
- No quality standard and inconsistent product
- Flowability problems
- Viewed as a by-product
Questions?