

# ***Corn Distillers Grains & Other Corn Byproducts for Dairy & Beef Cattle***

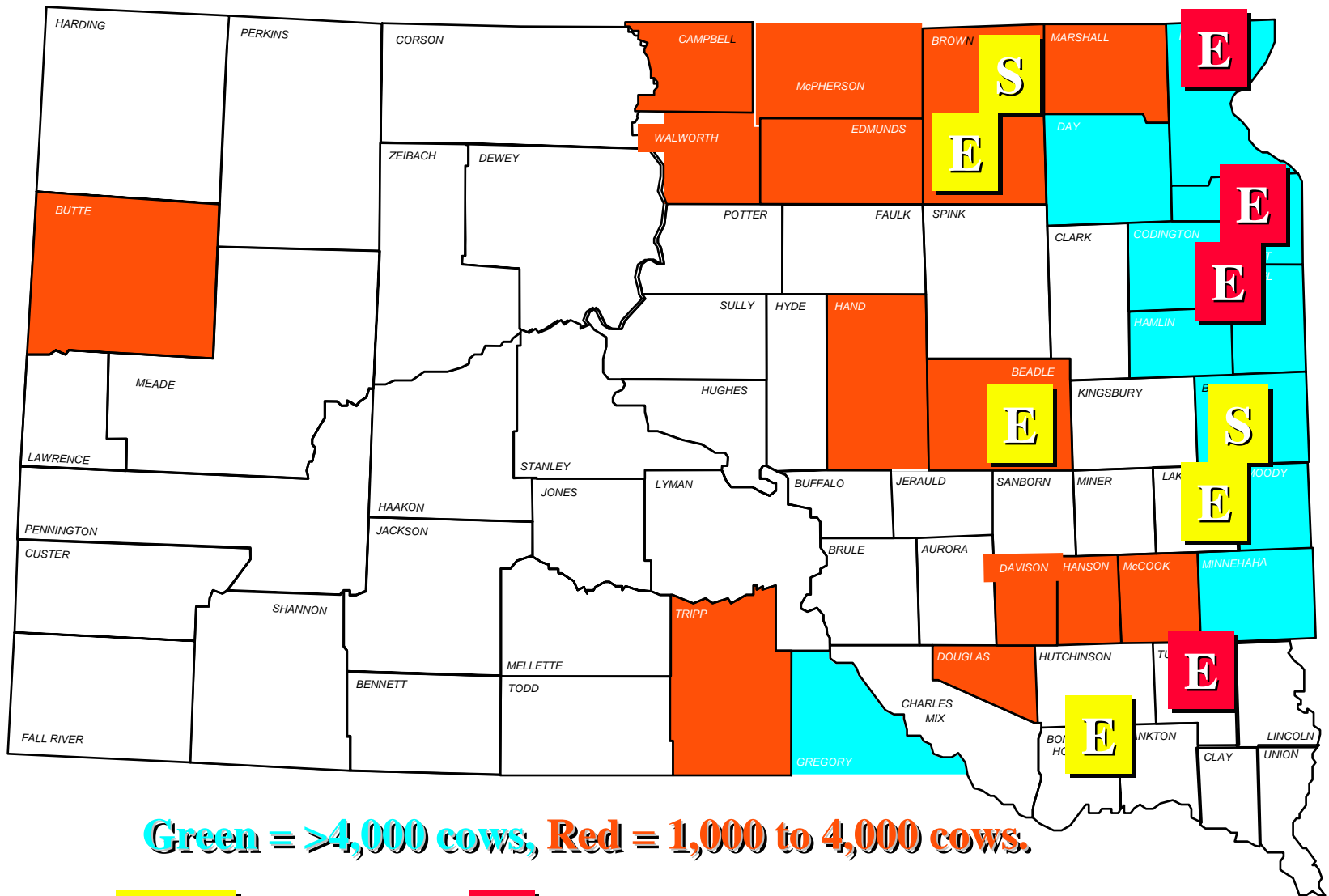
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# ***Introduction***

- **Distillers grains is a good energy and protein feed to include in livestock rations.**
- **This presentation will review the results of recent research at SDSU and elsewhere with feeding distillers grains, both wet and dried, to dairy and beef cattle.**
- **The use of other corn byproducts will also be reviewed.**

# Processing Co-Products Corn (E) & Soybeans (S)



Green = >4,000 cows, Red = 1,000 to 4,000 cows.

E, S

Online;

E

Online 2002-2003

# *The Composition of Distillers Grains*

<u>Item</u>	<u>% of DM</u>
Crude Protein	30-36
RUP, % of CP	47-57
NE <sub>L</sub> , Mcal/lb	1.00
Fat	9.8
ADF	19.0
NDF	38.0
Ca	0.15
P	0.83

# ***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 of Dairy Cows When Fed CDG***

- **The same as or greater than when fed SBM**
- **Increased or no change when supplemented with Protected Lys & Met**
- **Similar to when fed a blend of protein supplements (SBM, FM, CDG)**
- ***SUMMARY: a good quality protein***

# ***CDG for Beef Cattle***

- **As protein source, 6-15% of ration DM**
- **As an energy source,**  
***When fed at >15% of DM***  
***May reduce acidosis because highly digestible fiber in place of starch***
- **Wt gains & feed efficiency usually better than with corn**

***Klopfenstein et al., NE***

# ***Determining the Energy Value of Wet Corn Distillers Grains***





# ***Energy in CDG***

**Today's CDG contains:**

**7-11% more energy than “book values”  
10-20% more energy than corn**

- **$NE_L = 1.00$  Mcal/lb**
- **$NE_M = 1.06$  Mcal/lb**
- **$NE_G = 0.73$  Mcal/lb**  
 **$TDN = 94\%$**   
 **$DE = 1.84$  Mcal/lb**  
 **$ME = 1.64$  Mcal/lb**



# ***Whiskey or Fuel Ethanol Distillers Grains?<sup>1</sup>***



**When fed DDGS from Whiskey or Fuel Ethanol Plants:**

- \* Similar milk production whether DDGS was from whiskey or fuel ethanol production**
- \* Higher production than when fed SBM**
- \* If DDGS was dark (heat damaged?), production was the same as when fed SBM**

**<sup>1</sup> *FL Research, 1995***

# ***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*  
*Once opened, spoilage will start*
- **Blend with soyhulls**  
*K. Kalscheur & A. Garcia, SDSU, 2002*
- **Preservatives**  
*Various industry groups*  
*May extend by a few days*

# ***How Much CDG Can be Fed to Dairy Cows?***

- **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***

# ***How Much CDG Can be Fed to Beef Cattle?***

- **Can feed larger percentage of diet but fewer pounds than fed to dairy cattle**
- **Up to 15% of ration DM as protein source**
- **At 20-40% of DM:**

***e.g. ~4-8 lb/d of Dried; 12-24 lb/d of Wet***

***May decrease DMI @ >30% of DM,***

***especially if wet CDG***

***May feed excess protein***

***May feed excess P, especially if CDGS***

# ***Example Ration Considerations for Dairy Cattle***

- **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**
- **Corn Gluten Feed**
- **Corn Distillers Solubles (Syrup)**



# ***Other Corn Products as Feeds***

- **Corn Gluten Meal**

*High Protein (60%) & High RUP (55% of CP)*

*Low in Lys; best to blend with other*

- **Corn Gluten Feed**

- **Corn Distillers Solubles (Syrup)**

# ***Other Corn Products as Feeds***

- **Corn Gluten Meal**

*High Protein (60%) & High RUP (55% of CP)  
Low in Lys; best to blend with other*

- **Corn Gluten Feed**

*Med. Protein (25%), Low RUP (25% of CP),  
Good Energy ( $NE_L = 0.86$  Mcal/lb)*

- **Corn Distillers Solubles (Syrup)**

# ***Other Corn Products as Feeds***

- **Corn Gluten Meal**

*High Protein (60%) & High RUP (55% of CP)  
Low in Lys; best to blend with other*

- **Corn Gluten Feed**

*Med. Protein (25%), Low RUP (25% of CP),  
Good Energy ( $NE_L = 0.86$  Mcal/lb)*

- **Corn Distillers Solubles (Syrup)**

*Often blended with CDG as CDG+Solubles  
Med. Protein (18% CP),  
Good Energy (21% EE;  $NE_L \sim 0.91$  Mcal/lb)  
Increased Milk Production when fed 5% CCDS*

# ***Conclusions***

- **CDG is a good protein and energy feed to include in rations of dairy & beef 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.**
- **Other corn byproducts such as CGM, CGF, & Distillers solubles are also good**

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