Feeding Ethanol By-products to Beef Cattle

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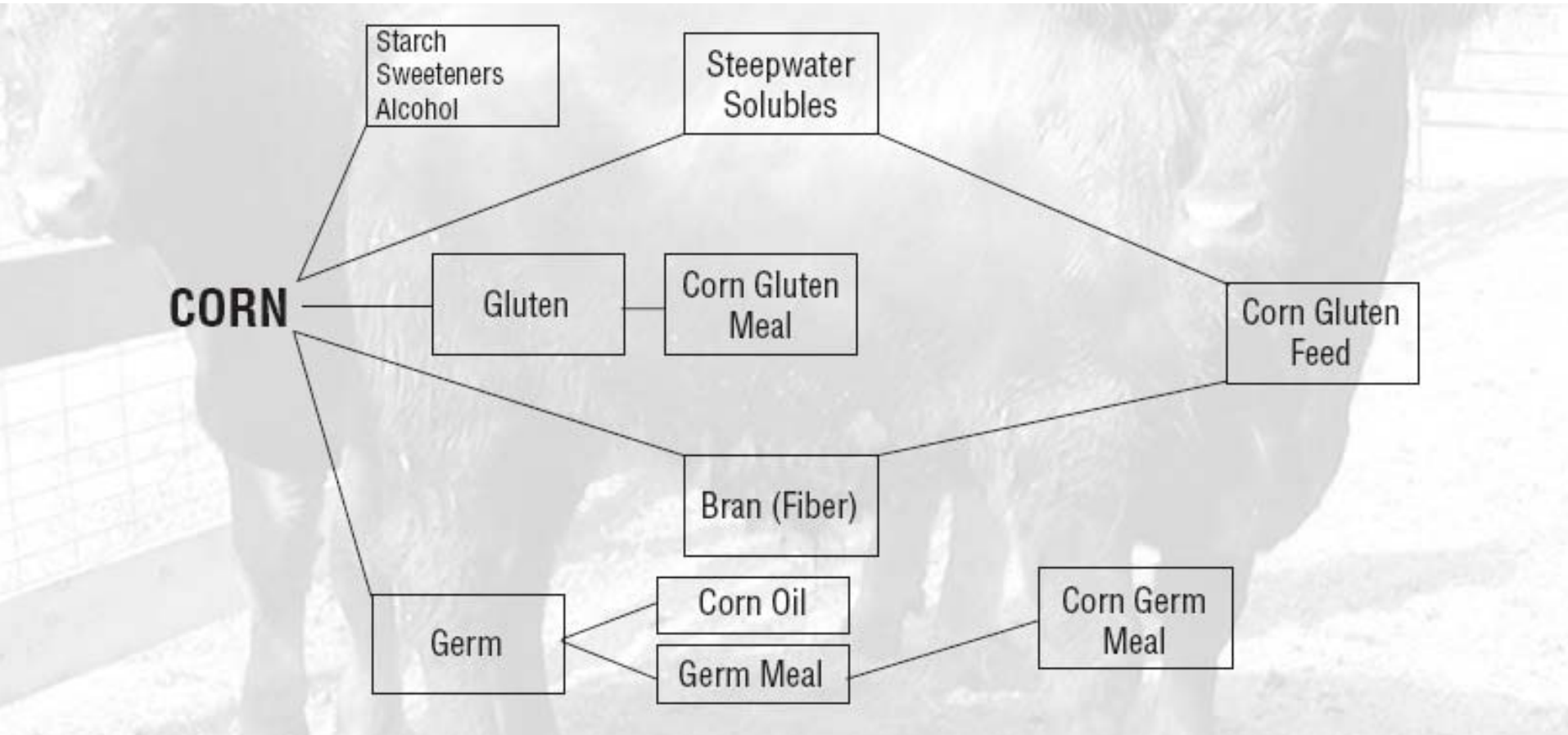
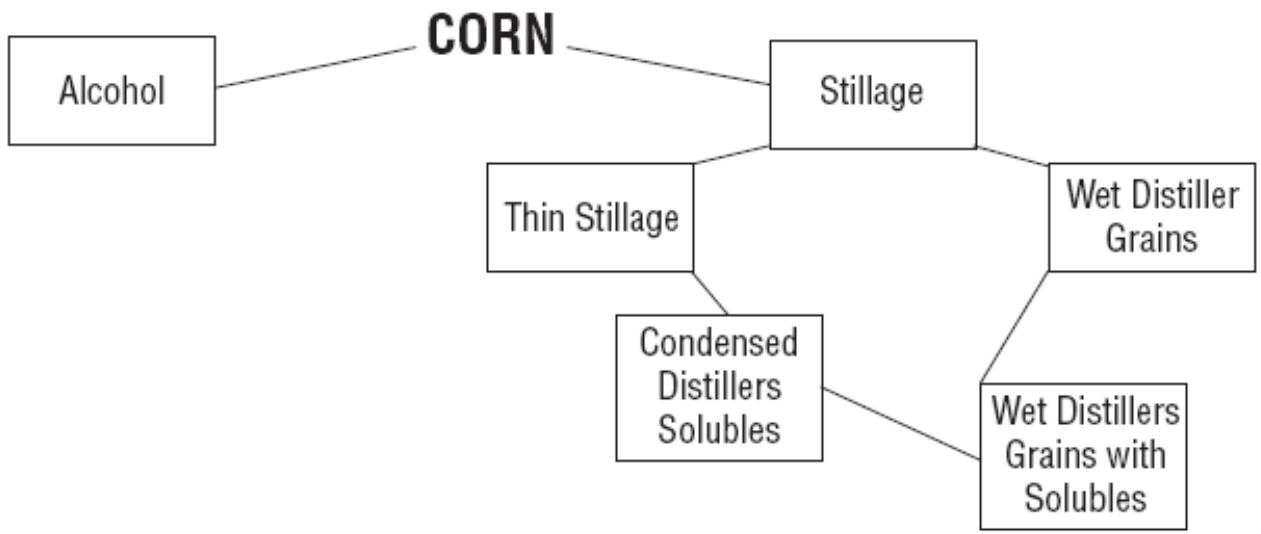
Wet Corn Milling Process



Dry Corn Milling Process



Products of the dry corn milling industry

Table 1. Nutrient Profile of Dry Mill Process Corn Co-products (and Wet Corn Gluten Feed)

	WDGS	CCDS	Modified DGS	DDGS	WCGF
DM	31-36	25-45	46-51	89	40-60
CP	32-36	14-23	26-32	31	17-21
Fat	9-12	15-24	11-16	11	3-4
ADF	10-12		11-18	12	12-14
NDF	30-50		35-50	45	38-48
NEg	.70-.80	.85-.93	.70-.80	.68	.62-.67

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Dry Matter Basis

Dried Distillers Grains with Solubles

Typical Analysis

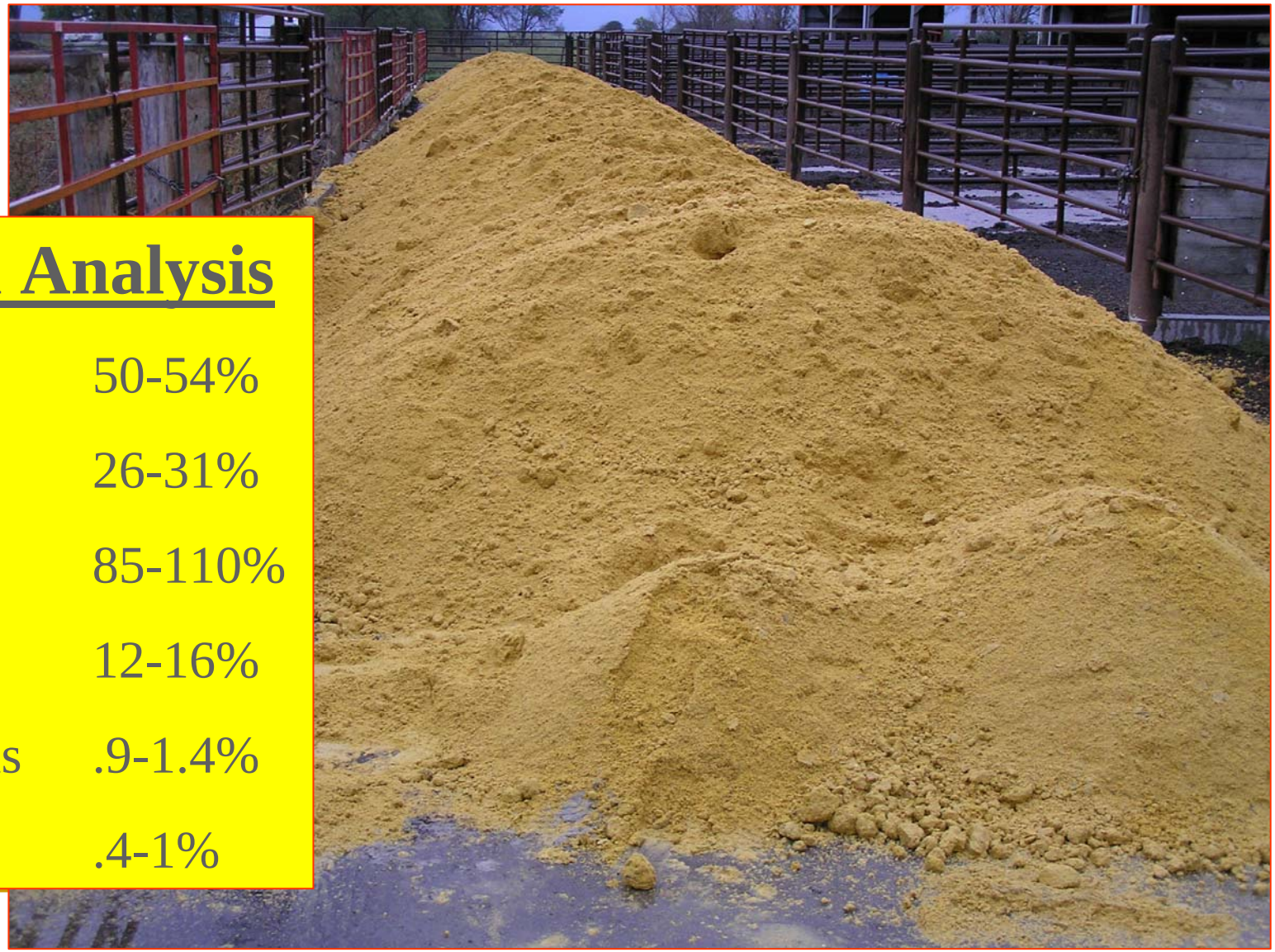
Moisture	9-12%
Protein	28-32%
TDN	87%
Fat	8-12%
Phosphorus	.6-1%
Sulfur	.6-1%

Wet Distillers Grains with Solubles

Typical Analysis

Moisture	62-70%
Protein	30-34%
TDN	90-110%
Fat	8-10%
Phosphorus	.5-.8%
Sulfur	.4-.8%

Modified Distillers Grains with Solubles



Typical Analysis

Moisture	50-54%
Protein	26-31%
TDN	85-110%
Fat	12-16%
Phosphorus	.9-1.4%
Sulfur	.4-1%

Condensed Distillers Solubles

Typical Analysis

Moisture	58-75%
Protein	13-15%
TDN	95-120%
Fat	11-18%
Phosphorus	1-1.4%
Sulfur	.8-1.4%

New Process Technologies that Affect Dry Mill Co products

- Fractionation
  - High Protein DG – 40%
  - Germ Product
  - Bran Product – ~12% Protein, High Fiber, Low Fat
- Oil Removal of DDGS
  - Low Oil DDGS
- Partial Oil Removal of Condensed Distillers' Solubles

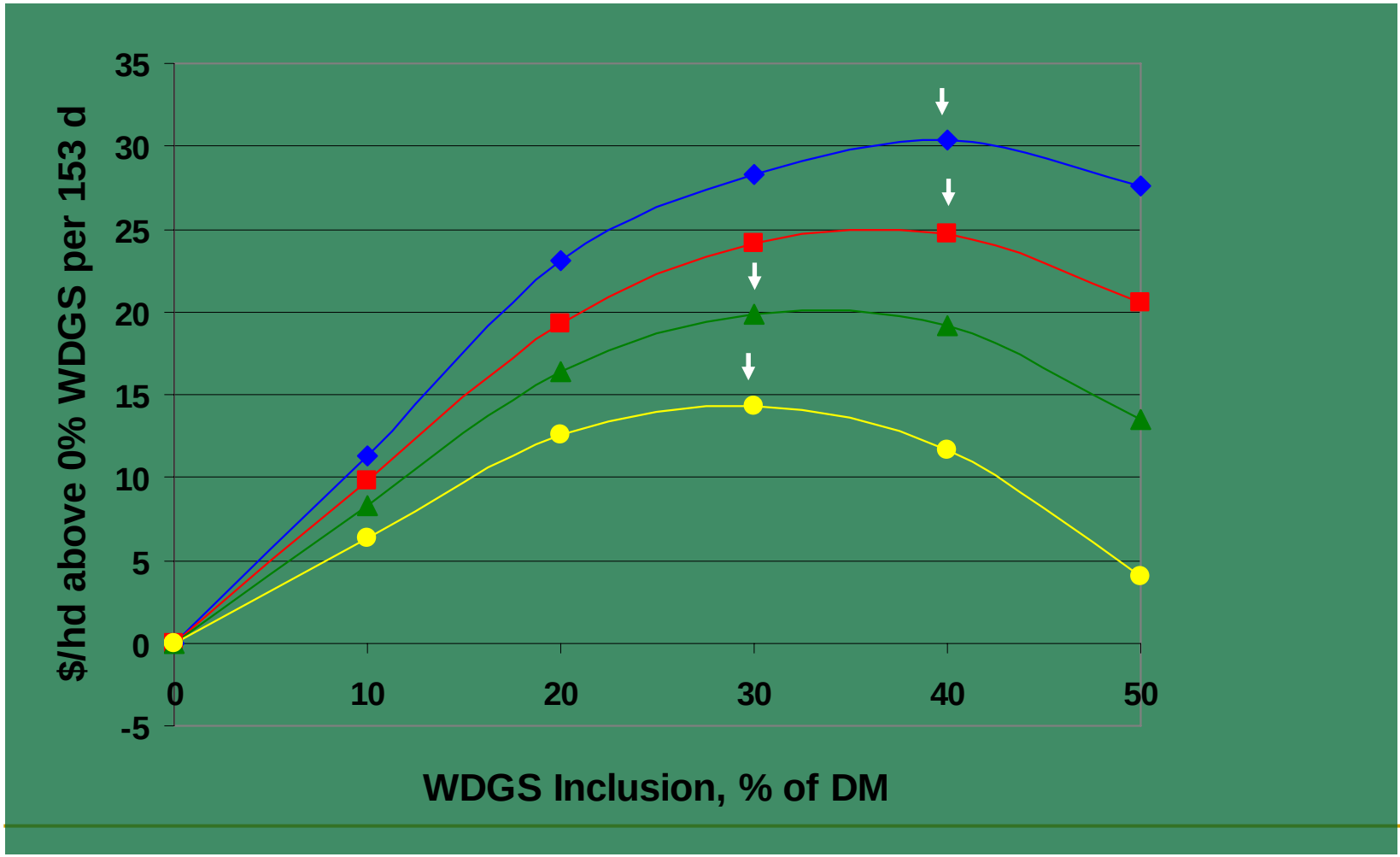
How Distillers Grains are Generally Marketed

- Wet and High Moisture Feeds
  - Local feed broker, often either a plant employee or associated with a local cooperative
- Dried Distillers Grains with Solubles
  - Specialized commodity broker, often merchandizing DDGS from many plants as well as other commodities such as soybean meal, cottonseed meal, linseed meal, etc.

Research on Feeding Distillers Grains with Solubles to Feedlot Cattle

- Feedlot cattle can be a high volume user of distillers feeds.
- Energy value is equal or superior to corn grain.
- Wet has a higher energy value than dry distillers grains
- Economics dictate levels of feeding, within limits.

Optimum Use

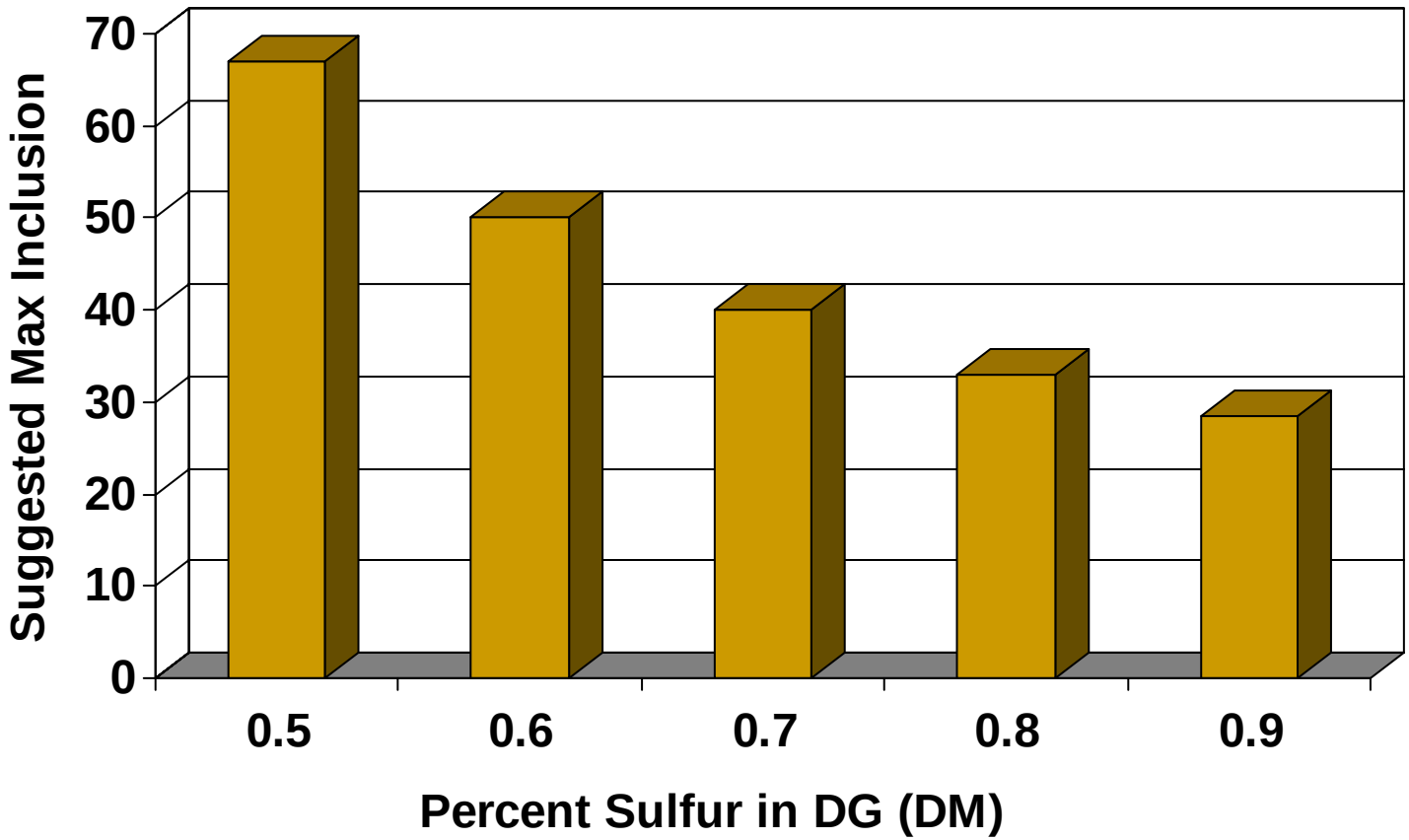


Assume: 85% of corn price, $0.10/bushel increase corn price, costs covered, 153 days
(Calculated from 2006 U. Nebraska Analysis)

Challenges (Feedlot)

- Fat content limits usage to 40-50% of ration dry matter
- Sulfur content may limit usage to even lower levels depending on source
- High moisture feeds have short shelf life
- Phosphorous will be in excess of requirements

Feeding Levels Can be Limited by Sulfur



Benefits and Challenges (Cow-calf operations)

- Benefits
  - Excellent source of protein, energy and P
  - Compliments low quality forages and crop residues
  - Stretches pasture and forage supply
- Challenges
  - Needed in small quantities often under extensive conditions (delivery systems)
  - Long term storage of wet feeds
  - May need to adjust mineral programs and other supplements