

Economics of DDGS



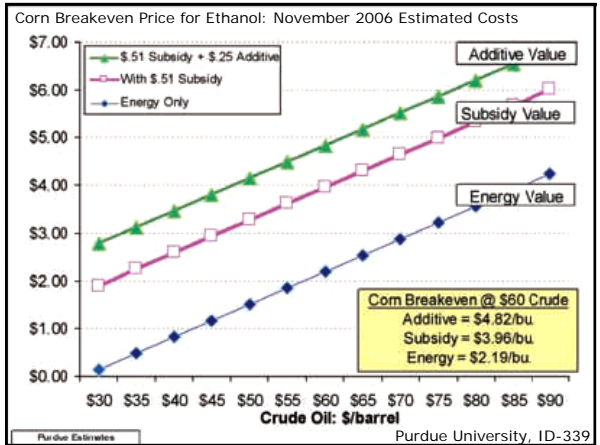
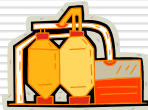
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Outline

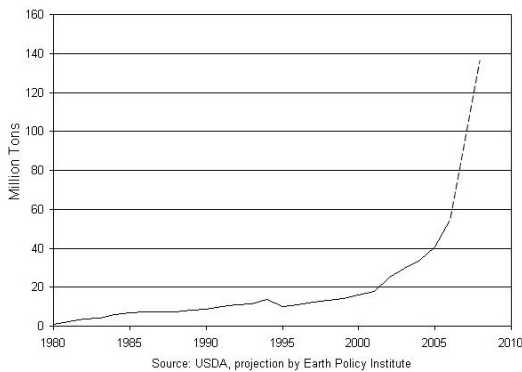
- Forecast of DDGS production
- A simple approach to pricing DDGS
- A more complete approach to pricing DDGS
- Factors affecting the value of DDGS for lactating cows
- Summary

DDGS production

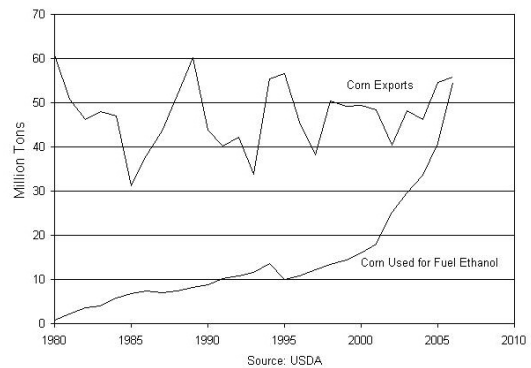
- There will be considerably more DDGS produced in the USA



U.S. Corn Use for Fuel Ethanol, 1980-2006, with Projection to 2008



U.S. Corn Use for Fuel Ethanol and for Export, 1980-2006



Projected Ethanol Production - OH

	Ethanol MG/Year	Corn MBU/Year	DDGS 1000 T/Year
In Production			
Liquid Resources of OH - Medina	4	1.5	12.4
In Construction			
ASAlliances Biofuels LLC -Bloomington	100	36.4	309.1
Coshocton Ethanol LLC - Coshocton	60	21.8	185.5
Greater OH Ethanol LLC - Lima	56	20.4	173.1
Harrison Ethanol LLC - Cadiz	20	7.3	61.8
Summit Ethanol LLC - Leipsic	60	21.8	185.5
The Andersons Mar. Ethanol LLC - Greenville	110	40.1	340.0
TOTAL	410	149.3	1267.3

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Would require 850,000 dairy cows eating 8 lbs/d of DDGS

Some useful conversion factors

- 1 bushel of shelled corn
 - 2.75 gallons of ethanol
 - 17 lbs of DDGS



Some useful conversion factors:

1,000,000 bushels of shelled corn =

- 28,000 tons of shelled corn
- 25,450 metric tons (MT) of shell corn
- 6,670 acres (at 150 bu/a.)
- 8,500 tons of DDGS
- 7,725 MT of DDGS
- 2,750,000 gallons of ethanol
- 50,000 barrels of ethanol
- 5,650 cows (at 8 lbs DDGS/cow/day)

Some useful conversion factors

- 1 gallon of ethanol
 - 0.364 bu of shelled corn
 - 6.2 lbs of DDGS



Some useful conversion factors

1,000,000 gallons of ethanol =

- 364,000 bu of shelled corn
- 10,200 tons of shelled corn
- 9,265 metric tons (MT) of shelled corn
- 2,425 acres (at 150 bu/acre)
- 3,090 tons of DDGS
- 2,810 MT of DDGS
- 2,060 cows (at 8 lbs DDGS/cow/day)

Corollary

- There will be less corn available for poultry and livestock production
- Ruminants will be the primary recyclers of DDGS



What is it worth?

- The simple approach:

Corn and soybean meal replacement

Standard Ingredient composition (NRC, 2001)

	CP (%)	NE _L (Mcal/kg)	RUP (%)	d-RUP (%)
Shelled Corn	8.3	1.77	3.9	3.5
48% Soybean Meal	48.2	1.98	20.5	19.1
DDGS	26.8	1.78	13.6	10.9

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DDGS	26.8	1.78	13.6	10.9
Equal CP (46% Corn, 54% SBM)	26.8	1.88	12.9	11.9
Equal Energy (95% Corn, 5% SBM)	10.3	1.78	4.73	4.3
Equal RUP (41.5% Corn, 58.5% SBM)	31.6	1.89	13.6	12.6
Equal d-RUP (52.5% Corn, 47.5% SBM)	27.2	1.87	11.8	10.9

So, DDGS ~ 50% Corn 50% SBM

Simply put:

DDGS Break-even price =

$$\begin{aligned} &\text{Corn (\$/bu)} \times 17.85 \\ &+ \\ &\text{SBM (\$/ton)} \times 0.5 \end{aligned}$$

Examples

	EX 1	EX 2	EX 3	EX 4
Shelled Corn (\$/bu)	2.00	3.00	4.00	3.70
Soybean Meal (\$/ton)	150	150	200	210
DDGS (\$/ton)	111	129	171	171



What is it worth?

- The simple approach:
Corn and soybean meal replacement
- The more complete approach:
 - Considering all feeds traded in a given market
 - Considering all nutrients of economic importance

Sesame Results Jan 2007, Central OH

Name	Calibration set			
	Actual (T)	Predicted (T)	Lower bid	Upper bid
Alabama Hay - 44 NEF 20 CP	130,000	116,637	99,445	133,828
Bakery Byproduct Meal	141,000	177,747	169,153	186,340
Beet Sugar Pulp, dried	140,000	137,324	123,000	150,769
Brewers Grains, wet	40,000	32,005	29,225	34,906
Canola Meal, mech. extract	169,000	141,900	131,036	152,763
Citrus Pulp-dried	177,000	147,571	140,424	154,718
Corn Grain, ground, dry	142,000	101,400	173,411	169,405
Corn Silage, 32-38% DM	40,000	56,139	50,158	62,120
Cotton Seed Meal, 41% CP	165,000	174,551	165,224	183,876
Cotton Seed, Whole w/ Int	190,000	196,934	174,848	219,022
Distillers Dried Grains w/ Sol	147,000	170,035	159,063	189,007
Flaxseed, Hydrolyzed Meal	255,000	275,365	259,112	293,047
Gluten Feed, dry	123,000	143,077	134,752	151,372
Gluten Meal, dry	355,000	316,101	293,036	336,503
Honney	125,000	156,763	149,484	164,082
Meat Meal, rendered	250,000	231,478	216,951	246,106
Molasses, Sugarcane	154,000	127,961	121,124	134,799
Soybean Hulls	124,000	94,832	76,056	113,606
Soybean Meal, expellers	239,700	279,091	264,110	294,063
Soybean Meal, solvent 44%	201,700	184,901	170,297	199,509
Soybean Meal, solvent, 48	209,700	213,796	201,082	226,497
Soybean Seeds, whole risk	261,000	271,837	259,054	294,819
Tallow	495,000	471,085	444,174	497,996
Wheat Bran	112,000	104,341	91,370	117,312
Wheat Middings	105,000	117,940	106,640	129,257

Sesame Results Jan 2007, Central OH

Estimate of Nutrient Unit Costs

Nutrient name	Estimate	
NEI - 3X (2001)	0.114775	**
RDP	-0.096066	*
Digestible RUP	0.170704	**
ne-NDF	-0.040831	*
e-NDF	0.036639	~

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About \$171/ton with
Corn at \$3.70/bu &
SBM at \$210/ton

Break-even prices should be ceiling prices for DDGS

- Variation in nutrient content
- Problems in handling, storage, and transportation
- Effects on animal performance, end-product quality, nutrient management

Standard DDGS composition (NRC, 2001) (Composition on DM basis)

	CP (%)	NE _L (Mcal/kg)
Average	29.7	1.97
Standard Deviation	+/- 3.3	+/- 0.15

Variation in Nutrient Content

- Salt (sodium) is used in variable quantity as a drying agent
 - Sulfuric acid (sulfur) is added during the process to adjust pH
 - Variable heat damage during drying can bind some nutrients
-

Problems in Handling, Storage, and Transportation

- Can bridge in bins and railcars
 - Potential separation & settling issues when stored or mixed
 - Pelleting of feeds with > 5-7% DDGS reduces pellet throughput and pellet durability
-

Problems in Animal Performance

- High oil content can affect:
 - fiber digestibility
 - milk quality
 - immune function
 - end-product quality
 - reproduction
-

Problems in Animal Performance & Nutrient Management

- Diets containing DDGS can easily exceed requirements for:
 - Nitrogen
 - Phosphorus
 - Sodium
 - Sulfur
-

Summary

Substantially more DDGS will be produced in the US and Ohio.

Using corn and SBM prices (50/50) seems to provide a good estimate of the maximum value for DDGS.
