Feeding Distillers Dried Grains with Solubles (DDGS) to Swine

M. Honeyman
Iowa State University

Corn

- The most common swine feed ingredient
- The standard of comparison
- 75% of the diet and 50% of the diet cost
- Single largest cost in Iowa pig production

DDGS Compared with Corn

	DDGS	Corn	Ratio
Protein, %	28.0	8.3	337
Fiber, %	12.8	2.8	457
Fat, %	8.9	3.9	227
Lysine, %	0.82	0.26	315
Avail. Phos., %	0.64	0.28	229

Energy is about equal.

DDGS Quality

High quality DDGS is golden yellow and does not smell burnt.

Corn milling is a batch process, not continuous.

Quality varies—batch to batch, load to load, day to day, plant to plant.

An Example of DDGS Variability

One Iowa plant sampled 3 times/week for 20 weeks (58 samples)

	Average	Range
Dry matter, %	90.2 ± 1.0	88.3-93.0
Crude protein, %	28.0 ± 1.2	25.3-30.6
Crude fat, %	9.5 ± 0.9	7.6-11.3
Crude fiber, %	7.0 ± 1.1	4.1-10.4
Phos., %	0.7 ± 0.1	0.5-0.8

DDGS Use in Swine Diets

Recommendations

- 20% Nursery diets (after 2 wk old)
- 20% Finishing diets
- 40% Gestating sow diets
- 20% Lactation sow diets

Substitution rate:

Add:	Remove:
200 lb DDGS	177 lb Corn
3 lb Limestone	20 lb SBM
	6 lb Dicalcium Phosphate

Substitution rate using available nutrients:

Add:	Remove:
200 lb DDGS	114 lb Corn
2 lb Limestone	85 lb SBM
2 lb Lysine	4 lb Monocalcium Phosphate
	1 lb Fat

Value of DDGS in Swine Diets

With $200/ton SBM and

$3.00 corn = $130/ton

$3.50 corn = $140/ton

$4.00 corn = $150/ton

University of Illinois

Advantages of Feeding DDGS to Swine in Iowa

- Supply increasing
- 2 to 3.5 X amino acids, fat, and minerals
- Improves pig gut health
- Increased fiber good for gestating sows
- Highly available P=Reduced excretion
- Growth and feed efficiency unchanged
- Larger litters, perhaps

Challenges of Feeding DDGS to Swine in Iowa

- Variability in nutrient content
- Feed may not flow in feeders or bins
- Lower carcass dressing percentage
- More than 20% DDGS results in softer, oilier fat
- Increased nitrogen excretion
- Corn mycotoxins concentrated 3X

Future of Feeding DDGS to Swine in Iowa

- Control of DDGS for feeding
- Intense competition for energy
- Co-product composition will change
- Branded co-products
- More complex swine diets and formulation

Changing Composition

- No solubles added (DDG):
  Improve digestibility
- Fat removed for biodiesel:
  Lower fat content and energy
- High protein DDG: Lower fat and energy
  Lower phosphorous
  Higher protein
- Added soy hulls for flowability and fiber
  and lower energy
- Other co-products will emerge

DDGS Nutrient Availability to Pigs

- Overall good availability
- Phosphorus: 86% available (corn 21%)
- Lysine: 62% available (corn 66%)
- Fiber partially digestible

DDGS: Co-product of corn ethanol industry.

As of July 2007—24 corn ethanol plants and 22 more plants in progress.

For every bushel of corn,

18 lb. of DDGS produced.

Corn Components

Starch	Germ and Gluten
Fat/oil	Germ
Protein	Hull/bran
Fiber	Endosperm

In ethanol production, the corn starch is converted to alcohol.

The other components of the corn kernel are concentrated.

Thus, protein, fiber, and fat (oil) content of DDGS is more than corn.