

## **Measured Digestibility Values for DDGS Aid Diet Formulation**

South Dakota State University (SDSU) researchers measured digestibility values for distiller's dried grains with solubles (DDGS) that demonstrate for the first time that DDGS has nearly the same energy content as corn. This discovery will reduce the cost of formulating diets with DDGS.

SDSU scientists took 10 samples of DDGS collected from ethanol plants in South Dakota and formulated 11 diets. One diet was corn-based, and the rest were formulated by mixing each of the 10 sources of DDGS and the corn diet in a 1:1 ratio.

Eleven growing pigs were placed on test at 64.5 lb. for 22 weeks in metabolism cages that permitted total, but separate, collections of urine and feces. Each pig was fed each diet for two weeks.

All samples of urine and feces were analyzed for concentrations of energy, crude protein and phosphorus, and the Apparent Total Tract Digestibility (ATTD) for energy, protein and phosphorus were calculated. Levels of digestible energy (DE) and metabolizable energy (ME) in each source of DDGS were also calculated.

Results are presented in Table 1. The average ATTD values recorded for energy, crude protein and phosphorus in DDGS were 76.8%, 83% and 59.1%, respectively. The energy and protein digestibility values are similar to those found in corn.

However, the phosphorus digestibility in DDGS is much higher than that of corn, reducing the need for monocalcium phosphate in the diet by 5 lb./ton of feed if 20% DDGS is included in the diet. That represents a savings of about \$0.5/ton of feed.

The DE and ME values may vary among sources, but the experiment showed that the values are close to those of corn. The values for DE and ME in this experiment are 21% and 27%, greater than the values currently listed by the National Research Council.

Because energy values are similar to those found in corn, it eliminates the need to add extra oil to diets containing DDGS to maintain the same energy level.

“When pork producers and feed companies formulate diets with DDGS, they now have measured values for DE, ME and phosphorus digestibility to use in the formulas,” says lead SDSU researcher Hans Stein. “By using the energy value of DDGS, other nutrients may be included at ratios that match the energy in the diet. Therefore, diets containing DDGS can be more accurately formulated.”

Because values for phosphorus digestibility are now available, diets can be formulated without under- or oversupplying phosphorus, thus reducing the level of phosphorus excretion into the environment without lowering animal performance.

Researchers: H.H. Stein, C. Pedersen and M.G. Boersma, South Dakota State University.  
 Contact Stein by phone (605) 688-5435, fax (605) 688-6170 or e-mail [hans.stein@sdstate.edu](mailto:hans.stein@sdstate.edu).

Table 1. Apparent Total Tract Digestibility (ATTD) of Energy, Protein and Phosphorus, and Concentrations of Digestible Energy and Metabolizable Energy in Corn and in 10 Sources of DDGS Fed to Growing Pigs<sup>a</sup>

Item	Corn	Distiller's dried grains w/solubles (DDGS)	
		Average	Range
ATTD, energy, %	90.4	76.8	73.9 to 82.8
ATTD, protein, %	81.5	83.0	77.1 to 87.5
ATTD, phosphorus, %	19.3	59.1	50.1 to 68.3
Digestible Energy, kcal/kg. Digestible Matter	4,090	4,191	4,015 to 4,555
Metabolizable Energy, kcal/kg. Digestible Matter	3,989	3,871	3,678 to 4,255

<sup>a</sup>Data are means of 11 observations/treatment.