

# WRINKLE

A NEW UNDERSTANDING IN NUTRITION

DakotaGold

Issue 20200005

## DOES PARTICLE SIZE OF DDGS AFFECT DIGESTIBILITY?

Researchers have demonstrated that reducing DDGS particle size improves the feeding value for pigs. However, many individuals have questions about the method of grinding and potential impact of stage of production (growing vs finishing) on nutrient digestibility. The study (Acosta, et al., 2020) shows that while the method of grinding has little impact on digestibility, body weight and particle size do affect the digestibility of nutrients in DDGS.

### BACKGROUND

Livestock producers grind ingredients like DDGS as a way to increase the feeding value. This process increases the surface area to allow for greater access of digestive enzymes to the nutrients in the ingredient. Grinding may also improve the ingredient value by disrupting the fiber matrix to release additional nutrients.

### EXPERIMENTAL DESIGN

Researchers at the Iowa State Swine Nutrition Farm fed 24 barrows one of three different diets containing: 1) corn DDGS ground with a particle size of 670  $\mu\text{m}$ ; 2) corn DDGS ground with a hammer mill to a particle size of 450  $\mu\text{m}$ ; 3) corn DDGS ground with a roller mill to a particle size of 450  $\mu\text{m}$ . The researchers replicated the experiment during the growing and finishing period as a way to measure effects of body weight on digestibility.

The DDGS used for this study had a particle size of 670  $\mu\text{m}$  and thus remained unground. The other treatments used the same DDGS, but ground to the desired particle size with a hammer or roller mill. All treatment diets contained the same ingredients and only varied in type of DDGS.

### RESULTS

Finishing pigs had better diet dry matter, energy, and nitrogen digestibility compared with grower pigs. However, growing pigs had better diet fat digestibility compared to finishing pigs (Figure 1).

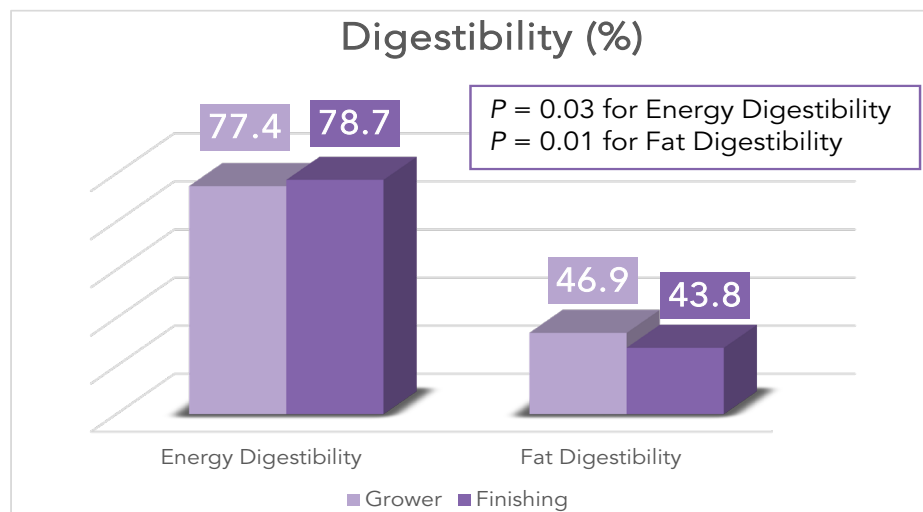
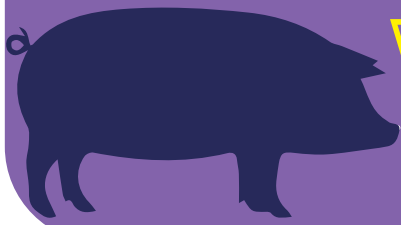


Figure 1. Energy and fat digestibility for grower and finishing pigs.

\*These results are not a guarantee of nutritional value, as laboratory results are influenced by factors beyond the control of POET Nutrition.



# WRINKLE

A NEW UNDERSTANDING IN NUTRITION

DakotaGold

Issue 20200005

Surprisingly, researchers did not observe any differences in diet fiber digestibility between grower and finisher pigs. Reducing particle size did increase diet dry matter, energy, nitrogen and fat digestibility compared with the unground DDGS that had a larger particle size (Figure 2). Method of grind (hammer vs roller mill) did not affect any digestibility measure. Similar to the body weight comparison, reducing the particle size did not affect any of the fiber digestibility estimates.

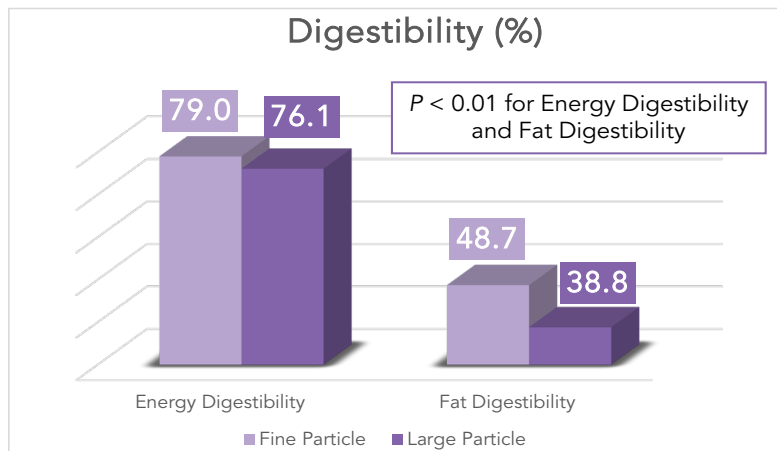


Figure 2. Energy and fat digestibility for fine and large particle size DDGS.

## CONCLUSIONS

These data confirm previous research that showed smaller particle size DDGS has greater feeding value compared with larger particle size DDGS. Reducing particle size from 670  $\mu\text{m}$  to less than 450  $\mu\text{m}$  improved digestibility of dry matter, energy and nitrogen by approximately 3%. This same particle size reduction improved fat digestibility by more than 25%.

This reinforces the argument that other factors besides just amount of fat in DDGS affect feeding value. If we use the estimates from this research for fat digestibility, a larger particle size DDGS that has 7% fat contains similar amounts of digestible fat as a 5.5% fat DDGS with finer particle size (Figure 3).

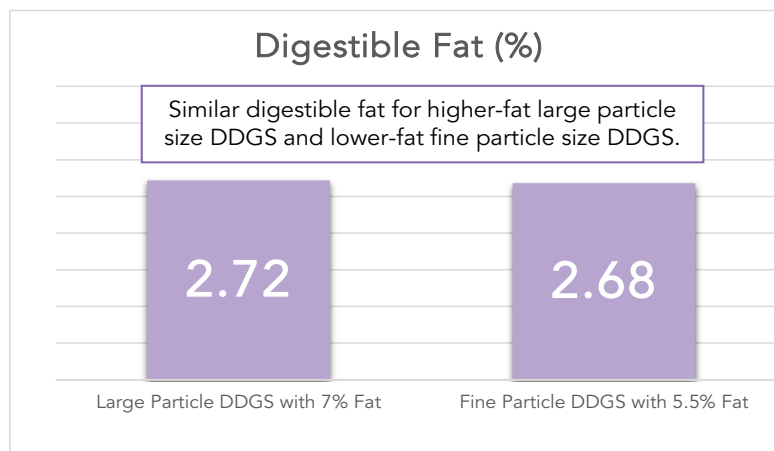


Figure 3. Digestible fat in DDGS with different particle sizes and fat contents.

Although this research did not investigate Dakota Gold, it shows how DDGS like Dakota Gold that has a fine particle could have greater digestibility and specifically, fat digestibility. This improvement can affect the feeding value of DDGS and potential inclusion in swine formulations.

\*These results are not a guarantee of nutritional value, as laboratory results are influenced by factors beyond the control of POET Nutrition.