

Swine researchers seek answers to fiber's low digestibility

8 September 2010

As interest grows in feeding distillers dried grains with solubles (DDGS) to growing pigs, many questions are being asked about the digestibility of this alternative feed option.

"Previous research shows that while the amount of energy in DDGS is greater than that of corn, pigs have lower digestibility of energy in DDGS than in corn," said Hans H. Stein, U of I associate professor in the Department of Animal Sciences. "Our goal was to find out why."

Stein's team wanted to develop a greater understanding of the digestibility differences between DDGS and corn. He said the biggest difference between corn and DDGS is fiber content. Fiber contributes to the total energy in DDGS, but not much is known about how pigs utilize the fiber in DDGS.

"We want to find ways to improve the utilization of this energy source in a swine diet," he said. "But first we need to understand the role of fiber in DDGS."

Our research demonstrated that overall, the utilization of fiber in DDGS is low - less than 50 percent. Fiber is characterized as soluble or insoluble fiber. The soluble fiber consists of pectins, some hemicelluloses and some oligosaccharides, Stein said.

"Soluble fiber will change the viscosity of the digesta in the [intestinal tract](#) while absorbing water and becoming easily fermentable in the intestinal tract," he added.

On the other hand, insoluble fiber will not dissolve in solution and is made up of the hardest part of the plant such as cellulose and lignin. These [fibers](#) do not change viscosity in the intestinal tract and they are the most difficult to [ferment](#).

"[Pigs](#) utilize soluble fiber very well, almost 90

percent," Stein said. "Unfortunately, most of the fiber in DDGS is insoluble and has a much lower digestibility. This is the reason for the low digestibility of the combined fiber fraction in DDGS. However, if we can do anything to change the solubility of fiber and make it more soluble, we know we can increase the utilization of it."

From a practical standpoint, DDGS's higher insoluble fiber content means more undigested material goes straight into the manure, which in turn creates more manure management issues for producers.

"If there is a higher fiber content in the manure, it creates a thicker slurry which could lead to more solids in the pit," said Matthew Robert, U of I visiting research engineer in the Department of Agricultural and Biological Engineering. "This requires the pit to agitate the slurry for a longer period of time to get the solids moving so it can be pumped out. If more solids are left in the pit after it's pumped, it results in less storage for the future."

In addition, Stein's study also opened doors to new research methods.

"We know that fiber could be measured in many ways," Stein said. "One of the standard methods of measurement, Total Dietary Fiber (TDF), is very expensive. We found a less expensive procedure, Neutral Detergent Fiber (NDF), to be quite effective and very closely correlated to TDF."

In future research projects, this finding can help save money and make research dollars stretch further to help swine producers.

Stein's team is continuing to look for ways to increase the solubility of fiber and in turn, find new ways to require less feed to produce one pound of gain.

More information: This research titled,

"Digestibility of dietary fiber in distillers coproducts fed to growing pigs," was published in the *Journal of Animal Science* by Pedro E. Urriola et al.

Provided by University of Illinois at Urbana-Champaign

APA citation: Swine researchers seek answers to fiber's low digestibility (2010, September 8) retrieved 23 April 2021 from <https://phys.org/news/2010-09-swine-fiber-digestibility.html>

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