Title: Preparing for the inevitable increase in fiber content in practical pig diets

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Our approach was to evaluate the best ways to characterize dietary fiber from corn co-products, and to determine the site of digestion of dietary fiber in the pig to better understand its potential contribution to dietary energy. We also evaluated the impact of the inclusion of dietary fiber from corn on growth performance and on the digestion and utilization of energy and nutrients in the diet. We conducted two metabolism trials using a total of 35 cannulated growing pigs and two growth studies using 70 growing and 70 finishing pigs. In the first metabolism trial, we evaluated the digestibility of fiber, energy, and nutrients in 9 corn co-products. In a second metabolism trial, we evaluated the effects of increasing the fiber content of the diet on the digestibility of fiber, energy, and various nutrients. In these two trials, by using cannulated pigs, we were able to determine where the fiber, energy and other nutrients were digested. Another two growth trials were conducted in growing and finishing pigs using corn bran to increase the fiber level of a corn-SBM diet, and including fat to keep the energy levels of the diet constant, to measure growth performance and digestibility of energy.

The digestibility of fiber is greater in distillers dried grains with solubles (**DDGS**) than in corn, indicating that fiber digestibility is improved by processing or fermentation at the ethanol plant. Our results indicated, however, that because of its components, fiber in corn co-products is more resistant to microbial fermentation. The digestibility of dietary fiber is also variable among corn co-products, which in turn may affect the digestibility of energy and nutrients differently. Results also indicated that increasing the fiber level in the diet with corn fiber, as may be the case of DDGS, decrease the digestibility of energy, fiber and nutrients of the diet, including lysine and most of the AA. Fat proved to be a mechanism to compensate for the reduction in energy supply when fiber is increased. The relatively high content of fat in DDGS mitigates the negative effects of increased fiber in the diet due to DDGS inclusion. Production of lower fat varieties of DDGS, however, may decrease the digestibility of energy and nutrients in the diet even further and as a consequence, the dietary net energy. It is also important to consider that about half of the fiber from corn co-products escapes fermentation in the digestive tract of the pig. Industrial processes leading to the improvement of fiber digestibility of corn co-products are a good alternative to better utilize the energy trapped in the fiber matrix.

Key Findings:

- While the fiber content of DDGS is greater than in corn, it is less digestible compared to corn.
- Digestibility fiber varies between corn co-products and may in turn affect the digestibility of energy and dietary nutrients including lysine and other amino acids.
- The relatively high dietary fat content of DDGS mitigates the negative effects of increased fiber from inclusion of DDGS.
- Use of reduced-fat DDGS may decrease the digestibility of energy and dietary nutrients.