Corn co-products from wet milling may be included in pig diets, study shows

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Many co-products from the corn processing industry may be used in diets fed to pigs. Much attention over the last 10 years has been on co-products produced from the biofuels industry, including distillers dried grains and high-protein distillers grains. However, the wet milling industry also produces many different co-products that may be used in pig diets.

Because little information about co-products produced from the wet milling industry has been reported, research from the University of Illinois is helping to determine the nutritional value of four of these co-products so that producers and companies can incorporate these ingredients into swine diets, said Hans H. Stein, a U of I animal science researcher.

Researchers, led by Stein, conducted two experiments using corn and four co-products, which included: high-fat corn germ (HFCG); corn bran; liquid corn extractives (LCE); and LCE added to corn germ meal (CGM-LCE). The experiments were conducted to determine the energy concentration and amino acid digestibility.

Stein explained that HFCG is a high-fat product (30 percent fat), which compares to only 3 percent fat in corn. Corn bran is high in fiber but low in fat. Liquid corn extractive is a liquid product usually not used as feed alone, but often added to corn gluten feed. During the experiments, the researchers added LCE to corn germ meal to create a new product from the corn processing stream that could be used as feed.

Corn contained 3,986 kilocalories of digestible energy (DE) per kilogram of dry matter, more than any of the other ingredients. The digestible energy in the remaining products was similar in HFCG (3,631 kcal/kg), LCE (3,485 kcal/kg), and CGM-LCE (3,567 kcal/kg), with the lowest in corn bran (3,205 kcal/kg).

Corn also had the greatest concentration of metabolizable energy (ME) at 3,871 kcal/kg dry matter, followed by HFCG (3,336 kcal/kg), CGM-LCE (3,272 kcal.kg), LCE (3,102 kcal/kg), and corn bran (3,077 kcal/kg).

"The lower concentration of DE and ME in the corn co-products was not surprising because all these co-products have a much higher fiber concentration than corn," Stein said. "They are all lower energy than corn, but that doesn't mean we can't use them because there are some circumstances when we want lower energy, such as in diets for gestating sows. We don't want gestating sows to overeat high-energy products so it is good to have a high-fiber ingredient. Corn germ meal is very good for sows, and we can also utilize quite a bit of these ingredients in growing pig diets."

Amino acid digestibility was reduced with the corn co-products compared with corn. Total AA digestibility was greater than 75 percent in corn, with CGM-LCE, HFCG, and LCE greater than 50 percent. The AA digestibility in corn bran was less than 50 percent.

"We observed that there are reductions in amino acid digestibility in all the co-products compared with corn. That will require using more soybean meal or another protein source if any of these ingredients are used," Stein explained.

Stein explained that, with the results of this research, nutritionists can now formulate diets using the co-products from the wet milling industry.

"By adding LCE to corn germ meal, we attempt to add value to both co-products," Stein said. "This illustrates how many different options there are in corn. It is an amazing crop."

More information: "Energy concentration and amino acid digestibility in corn and corn coproducts from the wet-milling industry fed to growing pigs" was recently published in the *Journal of Animal Science*.

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