

**Title:** Energy and amino acid digestibility of corn distillers syrup by-products in growing pigs – NPB #07-143

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## Scientific Abstract:

The soluble component of distillers dried grains with solubles (DDGS) may contribute to the low and variable digestibility of energy, lysine and other amino acids, nitrogen, and phosphorus. Combining solubles and grains sometimes produces “syrup balls” and their digestibility is unknown. The objective of this experiment was to determine digestible and metabolizable energy, apparent and standardized ileal amino acid digestibility (SID), and nitrogen and phosphorus digestibility of corn distillers solubles co-products and to determine if the presence of syrup balls in DDGS impacts nutrient digestibility. The ingredients evaluated were DDGS, intact syrup balls (ISB), ground syrup balls (GSB), liquid condensed solubles (LCS), and pulse dried thin stillage (PDS) obtained from the same ethanol plant. Condensed solubles is produced by evaporation of thin stillage (TS). These ingredients were added at a rate of 20% to a corn based basal diet for energy, nitrogen, and phosphorus digestibility determinations. All test ingredients were used as the only source of amino acids in the experimental diets for amino acid digestibility determinations. Pigs were individually housed in 36 metabolic crates in an environmentally-controlled, metabolism unit and were allowed a 12-d period to adapt to their assigned experimental diets (fed at a level of 3.5 times maintenance energy requirements), followed by a 3-d period in which all feces and urine from each pig were collected for energy, N and P digestibility determinations. In a duplicate 6 x 6 latin square with 7-d periods, the 6 treatments consisted of a N-free diet and the 5 test ingredients. Pigs had 5-d of adaptation to each diet, and on d 6 and 7, ileal digesta were collected from the distal part of the ileum for 8 h. The amount of digestible and metabolizable energy in ISB, GSB, LCS, and PDS is relatively high and these ingredients are acceptable for use in growing swine diets. Nitrogen digestibility is also relatively high compared to other by-product ingredients. More specifically, the amino acid digestibility of GSB and ISB were equal or higher than that of DDGS. Digestibility of CS was lower than that of DDGS for total essential amino acids (EAA), but not for lysine. The TS had the lowest amino acid digestibility, perhaps due to heat damage during spray drying. Phosphorus digestibility of all of these co-products is high and far exceeds phosphorus digestibility in corn and soybean meal. In conclusion, feeding DDGS with ground or intact syrup balls has little impact on the nutritional value of DDGS for growing swine. The presence of syrup balls does not decrease amino acid digestibility of DDGS. However, formulating diets containing LCS requires accounting for lower amino acid digestibility since the LCS evaluated in this study has lower EAA digestibility than DDGS.

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Contributing organizations for 2007 include: Arizona Pork Council, DPI Global, Eli Lilly/Elanco, Iowa Corn Growers Association, Iowa Pork Producers Association, Illinois Corn Marketing Board, Illinois Pork Producers Association, Kansas Corn Commission, Kansas Pork Association, Lucta USA, Minnesota Pork Board, Missouri Pork Producers Association, Monsanto, Mississippi Pork Producers Association, Montana Pork Producers Council, National Corn Growers Association, North Carolina Pork Council, Inc., National Pork Board, Nebraska Pork Producers Association, Inc., Ohio Pork Producers Council, Pioneer Hi-Bred International, Inc., Utah Pork Producers Association and the Wisconsin Pork Association.

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