Title: Understanding the effects of increased fiber from corn origin on the supply of energy and nutrients to the pig – NPB #13-015

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Scientific Abstract:

The use of corn co-products increases the concentration of fiber and often the use of supplemental fat in swine diets, which may affect energy and nutrient digestibility. An experiment was conducted to determine the effects of reduced oil distillers dried grains with solubles (DDGS-RO) and soybean oil (SBO) on dietary Lys, acid hydrolyzed ether extract (AEE), and neutral detergent fiber (NDF) digestibility in corn-based diets fed to growing pigs. Eighteen growing pigs (BW = 33.8 ± 2.2 kg) were surgically fitted with a T-cannula in the distal ileum and allocated to 1 of 6 dietary treatment groups in a 3-period incomplete latin square design, with 9 observations per treatment. Six dietary treatments were obtained by adding 0, 20, and 40% DDGS-RO to corn-casein diets formulated with 2 and 6% SBO. Ileal digesta and fecal samples were collected and the apparent ileal (AID) and total tract digestibility (ATTD) of AEE and NDF and the AID of Lys were determined. Results showed that the AID of Lys was not affected by SBO concentration (P > 0.05), but DDGS-RO inclusion showed a quadratic effect (P < 0.001). The AID of Lys was highly predictable (R² = 0.69) from the DDGS-RO and dietary SBO level. An interaction between DDGS-RO and SBO on the AID (P = 0.003; R² = 0.68) and ATTD (P = 0.004; R² = 0.79) of AEE was observed, where the AID and ATTD of AEE increased with SBO. The AID (72.5 to 79.1%) and ATTD (62.6 to 71.6%) of AEE increased with DDGS-RO at 2% SBO, but no effect was observed at 6% SBO. An interaction between DDGS-RO and SBO on the AID (P = 0.037; R² = 0.53) and ATTD (P = 0.004; R² = 0.36) of NDF was observed, where the AID (46.4 to 22.4%) and ATTD (52.0 to 40.9%) of NDF decreased with DDGS-RO at 6% SBO, but no effect was observed at 2% SBO. The AID of NDF increased (32.5 to 46.4%) with SBO at 0% DDGS-RO, but no effect was observed at 20 or 40% DDGS-RO. In conclusion, DDGS-RO increased the digestibility of AEE, and decreased the digestibility of NDF, but the effect was modulated by SBO. Soybean oil increased the digestibility of AEE but the effect was modulated by DDGS-RO, and increased the AID of NDF in diets without DDGS-RO. The AID of Lys decreased with DDGS-RO and was not affected by addition of SBO.