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Energy and phosphorus digestibility in high-protein distillers dried grain with solubles fed to growing pigs

Two experiments were conducted to measure the digestibility of energy and phosphorus in a new co-product from the ethanol industry. This product is produced by de-hulling and de-germing corn before it enters the fermentation process. The resulting distillers grain with solubles (DDGS) contains approximately 38% CP and 0.40% P. In Exp. 1, six growing pigs were placed in metabolism cages and fed a corn-based diet (97.6% corn) and a corn-DDGS based diet (50% corn, 47.7% DDGS). The DE and ME were measured for each diet and the DE and ME were then calculated for DDGS by subtracting the contribution of corn to the energy in the corn-DDGS diet. Results of this experiment showed that the DE and ME in high-protein DDGS is 4,763 and 4,476 kcal per kg DM, respectively. These values are greater ($P < 0.001$) than the DE and ME in corn (4,056 and 3,972 kcal per kg DM, respectively). Experiment 2 was conducted to measure the apparent total tract digestibility (ATTD) of Ca and P and the true total tract digestibility (TTTD) of P in high-protein DDGS. A P-free diet based on gelatin, cornstarch, and sugar, and a DDGS-based diet containing DDGS (60.0%), cornstarch and sugar were formulated. Each diet was fed to eight growing pigs during one 14-d period with total collections of urine and fecal matter during the last five d of the period. The ATTD and the retention of Ca and P were calculated for the diet containing DDGS and the endogenous loss of P was estimated from the pigs fed the P-free diet. Results of this experiment showed that the ATTD for Ca and P in high-protein DDGS are 75.0 and 59.6%, respectively and the retention of Ca and P are 52.6 and 58.9%, respectively. The endogenous loss of P was estimated at 211 ± 0.04 mg per kg DMI. By correcting the ATTD of P for the endogenous loss, the TTTD of P was calculated at 69.3%. It is concluded that high-protein DDGS has a high digestibility of energy, Ca, and P and it is expected that this feed ingredient will have a greater value than conventional DDGS when fed to pigs.

Key words: High-protein DDGS, digestibility, pigs