Effect of increased heat processing on phosphorus (P) bioavailability in corn distiller dried grains with solubles (DDGS). C. Martinez Amezcua*, L. E. Markovic, and C. M. Parsons, *Department of Animal Sciences, University of Illinois, Urbana*.

A few previous studies have shown that heat processing may increase the bioavailability of phytate-P in some foodstuffs. Therefore, two chick experiments were conducted to determine the effect of various increased heat processing treatments on bioavailability of P in DDGS. In addition, two precision-fed cecectomized rooster assays were conducted to evaluate the effects of the heat treatments on amino acid digestibility, particularly lysine. For the chick assays, a P-deficient corn starch-dextrose, soybean meal basal diet containing 0.10% nonphytate phosphorus was formulated. A standard curve was then constructed by adding 0.0, 0.05 and 0.10% P from KH2PO4 to the basal diet. For the DDGS treatments, a commercial sample of DDGS was obtained and then subjected to increased heat processing by autoclaving at 124 kPa and 121° C or by heating in a drying oven at 121° C. The various DDGS samples were then added to the P-deficient basal diet at levels of 7 to 14%. New Hampshire x Columbian male chicks were fed the experimental diets from Day 8 to 22 post-hatch, and growth performance and tibia ash were measured. Bioavailability of P was estimated using the slope-ratio method, where tibia ash was regressed on P intake from KH_2PO_4 or DDGS. In the first experiment, bioavailability of P in DDGS (% of total) was increased ($P < 0.05$) from 75 to 87% by autoclaving for 75 min. In the second chick assay, P bioavailability was significantly increased ($P < 0.05$) by autoclaving for 60 and 80 min, but not for 40 min. The effects of oven drying on P bioavailability were inconsistent. Lysine digestibility of DDGS determined by the cecectomized rooster assay was substantially decreased by the heat treatments, particularly for autoclaving, which caused large reductions. The results of this study indicated that increased heat processing may increase P bioavailability in DDGS but will likely reduce amino acid digestibility, particularly for lysine.

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