

The bioavailability of lysine in distiller's dried grains plus solubles

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Distiller's dried grains plus solubles (DDGS) is a by-product from ethanol production. "New generation" DDGS is almost entirely from corn fermentation and apparently undergoes a gentler drying process than the DDGS available in the past. The drying of DDGS raises questions about the availability of lysine. Thus, two experiments were conducted to evaluate the lysine availability in "new generation" DDGS. In experiment 1, chicks were placed on a standard starter feed from 0 to 7 d of age. After an overnight fast, 6 replications of 6 chicks were fed each of five experimental diets from 8-19 d of age. The experimental treatments were: 1) Corn gluten meal-cornstarch basal diet with 0.40% available lysine, 2) Basal + 0.10% Lys from L-lys•HCL (0.50% available lys), 3) Basal + 0.20% Lys from L-lys•HCL (0.60% available lys), 4) Basal + 10% DDGS, and 5) Basal + 20% DDGS. The basal diet was adequate in all nutrients except for lys, and DDGS was added at the expense of cornstarch. In a second experiment, true digestibility of lysine in DDGS was determined with total excreta collection of cecectomized roosters. In experiment 1, both slope-ratio and standard curve methodology were used to estimate lysine availability. A linear response ($P < 0.05$) was observed for weight gain and feed efficiency from the addition of L-lysine•HCL to the basal diet. Multiple regression analysis produced the model: $\text{gain (g)} = 14.4 + 0.15 \text{ lysine intake (mg)} + 0.10 \text{ DDGS intake (g)}$ ($R^2 = 0.98$). The ratio of slopes indicated a bioavailable lysine concentration of 0.66% in DDGS. The linear regression analysis produced the model: $\text{gain (g)} = 14.3 + 0.15 \text{ lysine intake (mg)}$ ($r^2 = 0.93$) and resulted in an average lysine bioavailability estimate of 0.79%. These values, expressed as a percent of the 0.83% total lysine in DDGS, yields availability estimates of 80.4 and 95.1% for multiple regression and linear analysis, respectively. True digestibility of lysine determined with cecectomized roosters (74.2%) was lower than the lysine availability determined with the chick assays.

Key words: Lysine, bioavailability, Distiller's dried grains plus solubles, chicks, cecectomized