

Nutrient digestibility of high protein corn distillers dried grains with solubles, dehydrated corn germ and bran.

A. Batal*, *University of Georgia, Athens.*

Sectors of the ethanol industry are starting to use a new bio-refining production technology which separates the corn into three fractions: fiber, germ and endosperm, prior to ethanol production. These fractions are then converted into new co-products, high protein distillers dried grains with solubles (HP-DDGS), dehydrated corn germ meal, and bran cake. Studies were conducted to determine the nutritional parameters of these new co-products. A chick experiment was conducted to determine the phosphorus (P) bioavailability based on tibia ash. In addition, conventional and cecectomized precision-fed rooster assays were conducted to determine TMEn and amino acid digestibility. For the chick assay, a P-deficient corn-soybean meal diet containing 0.13% non-phytate P was supplemented with 0, 0.05, 0.10, and 0.15% from KH₂PO₄ or 7 and 14% DDGS, HP-DDGS, and corn germ. Cobb 500 chicks were fed the experimental diets to 18 d of age and bioavailability of P was estimated using the slope-ratio method where tibia ash was regressed on P intake. The total P content and P bioavailability of the DDGS, HP-DDGS, and corn germ were 0.77 and 60, 0.35 and 47, and 1.18 and 31%, respectively. The average protein, fiber, and fat % for DDGS was 27, 7, and 10, for HP-DDGS 44, 7, and 3, for corn germ 15.5, 4.5, and 17, and for bran 11.6, 4.5, 7.8. The average TMEn was 2,829, 2,700, 2,965, and 2,912 kcal/kg (as-fed basis) for the DDGS, HP-DDGS, corn germ, and bran, respectively. Bran had a higher TMEn value than expected, which is likely due to the high fat content. Total concentration and percent availability, of lysine for the DDGS, HP-DDGS, corn germ, and bran was 0.79 (81), 1.03 (72), 0.83 (80) and 0.43% (68%), respectively. The total lysine as a % of CP was 3% for the conventional DDGS and only 2% for the HP-DDGS, however these products had a similar TMEn. New bio-refining techniques result in co-products that have unique nutritional qualities compared to conventional DDGS. Thus, confirmatory analyses should be conducted prior to utilizing these new co-products of ethanol production.

Key Words: Distillers Dried Grains with Solubles, Corn Germ, Amino Acid Digestibility