ABSTRACT:

Energy determination of corn co-products fed to broiler chicks from fifteen to twenty-four days of age and use of composition analysis to predict AME_n

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Fifteen co-products collected from various wet and dry milling plants were fed to broiler chicks to determine AMEn and to generate an equation to predict AMEn based upon each ingredient's chemical composition. Co-products included: DDGS (6), HP-DDG (2), dehydrated corn germ (2), corn germ meal, corn bran, corn gluten meal, corn gluten feed, and dehulled degermed corn. A control diet was fed containing corn, soybean meal, dextrose (15%), dicalcium phosphate, limestone, salt, vitamins, and trace minerals. Test diets were formulated by mixing the control diet with 15% of a co-product at the expense of dextrose. Nineteen hundred and twenty Ross × Ross 708 chicks (10 per pen; 5 males and 5 females) were randomly assigned to 15 dietary treatments (12 replicate pens). Broilers were fed experimental diets from 15 to 22 d of age followed by a 48 h total excreta collection period. Ingredients were analyzed for GE, CP, moisture, crude fat, crude fiber, ash, total dietary fiber, neutral detergent fiber, and acid detergent fiber, and hemicellulose was determined by difference. Gross energy was determined on the feed and excreta to calculate AMEn for each ingredient. The corn-soybean meal portion of the basal diet averaged 3,037 kcal AMEn/kg DM, with dextrose having an assumed value of 3,640 kcal/kg DM. For the 6 samples of DDGS, AMEn ranged from 2,146 to 3,098 kcal/ kg DM, averaging 2,676 kcal/kg DM. The AMEn values for dehydrated corn germ, corn germ meal, HP-DDG, corn gluten meal, corn gluten feed, corn bran, and dehulled, degermed corn were 3,308, 1,991, 2,820, 3,182, 1,746, 3,030, and 3,442 kcal/kg DM, respectively. Stepwise regression resulted in the equation: AMEn, kcal/kg DM = 3,517 + (46.02 × % crude fat, DM basis) – (82.47 × % ash, DM basis) – (33.27 × % hemicellulose, DM basis) (R^2 = 0.89; SEM = 191; $P \leq 0.01$). These results determined that wide variability exists among corn co-products produced from dry and wet milling plants, and that the best predictors of AMEn are crude fat, ash, and hemicellulose.

KEYWORDS: corn co-products, metabolizable energy, chicks