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Nutrient Intake and Pre-Caecal Amino Acids Digestibility of Broiler Chickens Fed Differently Processed Soybean Meal

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Abstract

Effects of differently processed soybean meal (SBM) and bird's age (BA) on nutrient intake, energy utilisation and pre-caecal digestibility of amino acids (AA) of broiler chickens were evaluated in a 3 × 3 factorial arrangement. Soybeans were subjected to 3 processing methods (PM): cooking, roasting and defatting and each were included in the diets for broilers of age 0–3, 4–6 and 7–8 weeks. Six hundred and forty eight day-old chicks (Ross 308) were divided into three groups. The first group was subjected to feeding trial at age 0–3 weeks, the second group was raised on a commercial diet till they were three weeks and raised on the experimental diets (4–6 weeks), while the third group was raised on commercial diet up to six weeks and placed on the experimental diets (7–8 weeks). The cooked soybean, roasted soybean and defatted soybean meal were included in diets A, B & C, respectively at the same level of 25% inclusion in each phase. Titanium oxide was included as indigestible marker. At the close of each phase birds were slaughtered and digesta collected from the gastro-intestinal tract between Meckel's diverticulum and 2 cm anterior to the ileo-caeco-colonic junction, pooled for all birds from the same pen, freeze-dried and analyzed. The DM, CP, NFE and ash intakes were significantly ($p < 0.001$) affected by PM and BA. The energy intake was only significantly ($p < 0.001$) influenced by PM. Also, the interactions between PM and BA for all the nutrients except the fat intake and energy intake were significantly affected. Only the digestibility coefficient of threonine, glutamic acid, and valine were not significantly ($p > 0.05$) influenced by PM while lysine, histidine, threonine, glutamic acid, proline and valine were not significantly influenced by the BA. Interactions between PM and BA were significant ($p < 0.05$; 0.01; 0.001) for all the AAs except for histidine and valine. It could be concluded that the bio-utilisation of SBM by broiler chickens depends on the processing methods adopted and the age at which they are fed to the birds as interactions between the processing methods and age of birds were significant in most cases.

Keywords: Amino acid digestibility, broiler age, differently processed soybean