

THE EFFECT OF METHIONINE, THREONINE AND ARGININE LEVELS IN LOW CRUDE PROTEIN DIET ON BROILER PERFORMANCE

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Introduction

High crude protein diets for broilers result in amino acid excesses and elevated nitrogen excretion. Nitrogen retention efficiency may be increased if low crude protein broiler diets are supplemented with crystalline amino acids in a pattern that matches maintenance and tissue accretion needs. Methionine and threonine are essential amino acids for poultry (Kidd, 2002).

Material and Methods

1040 one-day old broiler chicks (Ross 308) were used in this study in a factorial arrangement as 2 x 2 x 2 x 2 with 8 treatments and 5 replicates for each treatment. The treatments included: 2 levels of protein (100 and 88% of standard requirements), 2 levels of methionine (100 and 110% of standard requirements), 2 levels of threonine (100 and 110% of standard requirements) and 2 levels of arginine (0 and 0.1% of diet). The amino acid profiles of corn and soybean meal were analyzed by NIRS. Broilers received the dietary treatments from 1 to 42 d in three phases: starter from 0 to 14d (ME: 2900 kcal/kg, CP: 22.2%), grower from 14 to 28d (ME: 2980 kcal/kg, CP: 20.7%) and finisher from 28 to 42d (ME: 3000 kcal/kg, CP: 19.1%). Performance parameters (body weight, daily feed intake, daily weight gain and feed conversion ratio) were measured at different periods. The data were analyzed by SAS (2008) and differences were considered significant at $P < 0.05$.

Results and discussion

The results shown that decreasing dietary protein levels significantly decreased BW, DFI and DWG, and significantly increased FCR. However, increasing methionine and arginine in diet significantly increased BW. Threonine and arginine significantly decreased FCR. Threonine may participate to synthesis protein and materials from its metabolism such as glycine, acetyl CoA and pyruvate that are important for growth and FCR (Kidd and Kerr; 1997). It is possible that antioxidative effect of NO produced by dietary supplement of L-Arg increases the growth of epithelial cells in the intestine and improves nutrient assimilation (Foye et al., 2007).

Key Words: Methionine, Threonine, Arginine, Performance, Broiler

References

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