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Effect of Dietary Inclusion of Earthworm Meal Replacing Super-Concentrate on Broiler Performance and Carcass Characteristics

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Abstract

The objective of the study was to measure the effect of dietary substitution of imported super-concentrate (ISC) by different levels of earthworm meal (EWM) on broiler performance. A total of 144 unsexed one-day broiler chicks (Ross 308) were distributed to 12 pens that were randomly assigned to four treatments. Each treatment was replicated three times (12 birds per pen). In a completely randomised design, the dietary treatments consisted of 0, 1.5, 3.5 and 5 % of EWM replacing the ISC as animal protein source by 0, 30, 70 and 100 %, respectively. The experimental diets were formulated iso-nitrogenous and iso-energetic to meet or exceed the requirements of broilers. At day 42, two birds per replicate were slaughtered for determination of carcass and organs weights. The results showed that EWM contained 38.87 % protein, 3.71 % fat, 43.5 % ash, 0.93 % calcium, 0.5 % phosphorus, 0.68 % methionine, 5.56 % lysine (dry matter) and 7.99 MJ/kg metabolisable energy. Feed consumption, weight gain and feed conversion ratio were significantly ($p \leq 0.01$) affected by dietary treatments. The birds fed on control and 3.5 % diets consumed greatest and less feed, respectively. The birds fed on control, 3.5 and 5 % diets gained the largest weights, while the lightest one was observed with 1.5 % treatment. The same pattern of weight gain results was recorded with feed conversion ratio. Control and 3.5 % treatments scored the heaviest carcass weights ($p \leq 0.01$). The breast weights of birds fed on control diet were the best ($p \leq 0.01$) among all treatments. However, the control and 1.5 % treatments had the lowest weights of the drumstick. The weights of thigh and abdominal fat were greater for control followed by 3.5 % treatment. Liver weights increased as the dietary EWM inclusion increased. Moreover, the birds fed on control diet had largest liver weights. The intestinal length records and the weights of proventriculus and gizzard were unaffected by dietary treatments ($p \geq 0.05$). The study indicated that for most parameters investigated good results were obtained when 3.5 % of EWM was included in broiler diet replacing ISC by 70 %. So, dietary inclusion of EWM by 3.5 % could be used as an alternative protein source for broiler diets.

Keywords: Animal source protein, broiler, carcass characteristics, earthworm meal