

Effects of Feeding Probiotic Metabolites on the Growth and Carcass Characteristics of Broiler Chicken

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Abstract

The objectives of the study were to determine the effects of probiotic metabolites on the growth rates, feed conversion ratios and carcass characteristics of broiler chicken in an attempt to determine the potential use of probiotic metabolites to replace antimicrobial growth promoters. Three hundred day-old Cobb chicks were reared for 42 days. The five treatment groups comprised of one negative control without antibiotics or probiotic metabolites added into the feed, one positive control with antibiotic added, and the other three comprised of treatment groups with probiotic metabolites added at different concentrations, namely 0.5, 1.0 and 1.5%, respectively. The liquid metabolites added were from four strains of *Lactobacillus plantarum* isolated locally from fermented soya bean (*tempeh*) and tapioca (*tapai ubi*). The 60 chicks were assigned to each treatment comprising of six replicates. Each replicate comprising 10 chicks was randomly assigned to battery cages which are kept indoors. The feed and drinking water were provided *ad libitum*. The chickens were weighed individually every week and the feed weights were also recorded. Nine chickens from each treatment selected, using a stratified random method, were slaughtered at the end of the third week and at the end of the sixth week. Liver and gizzard were weighed while the duodenum, jejunum and ileum were measured. The 1.5% concentration of probiotic metabolites used was an effective dose to be supplemented for growth promoting purposes. The effect of probiotic metabolites on growth was good especially at the early stages. Probiotic metabolites significantly ($p < 0.01$) reduced feed intake especially in the beginning without significant ($p > 0.05$) changes to the weight gain. On the contrary, probiotic metabolites improved weight gain numerically especially at the first three weeks. The live weight gain was comparable to those of the antibiotic treatment group. The 1.5% MET also had a low feed conversion at both week 1-3 and week 1-6, contrary to the antibiotic group, which had high feed conversion ratios during week 1-3, although not significant ($p > 0.05$). The probiotic metabolites appear to be potential replacements for antimicrobial growth promoters. The effect of probiotic metabolites on the carcass characteristic was less prominent compared to the growth performances. It was deduced from the results that probiotic metabolites do not have a direct effect on the gizzard. The probiotic metabolites have protective effects on the liver as the liver of the 1.5% probiotic metabolite group was significantly ($p < 0.01$) smaller compared to the others at week 3. Meanwhile at week 6 there were no significant differences ($p > 0.05$) in liver weights between treatment groups. There was no particular effect of the probiotic metabolites on the intestinal length. However, there were correlations ($t < 0.05$) between the feed intake and intestinal length.

Keywords: broiler chicken, probiotic metabolites, antibiotic, growth performance, feed conversion efficiency, carcass characteristics, liver, gizzard, small intestine.