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Influence of different levels of humic acid and esterified glucomannan on growth performance and intestinal morphology of broiler chickens

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ABSTRACT

A study was under taken to investigate the effect of dietary supplementations of humic acid and esterified glucomannan) on broiler performance and the morphological measurements of small intestine. Two hundred and ten day old broiler chicks were weighed and randomly assigned to seven treatment groups in triplicate. The dietary treatments included T1) control (basal diet without any additives), T2) basal diets supplemented with 0.1% humic acid, T3) basal diets supplemented with 0.2% humic acid, T4) basal diets supplemented with 0.3% humic acid, T5) basal diets supplemented with 0.1% esterified glucomannan, T6) basal diets supplemented with 0.2% esterified glucomannan and T7) basal diets supplemented with 0.3% esterified glucomannan. Different parameters including body weight gain (BWG), feed intake (FI), feed conversion ratio (FCR) and morphology of small intestine were evaluated during six weeks of experimental period. According to the results, at the end of experimental period, the highest average BWG were recorded in T4 group (fed with 0.3% humic acid), compared to control (T1) and other experimental groups ($p < 0.05$). Where as, the highest body weight gain were observed during starter period in treatment 7 (fed with 0.3% esterified glucomannan) as compare to other experimental groups ($p < 0.05$). Statistically, feed intake remained unaffected during the experimental period in all the treatment groups. However, the lowest and the highest feed intake were observed numerically within treatments T4 and T1 with 4229.70 g and 4362.30 g, respectively. Addition of dietary supplements used in the study appeared to have significant effect on the morphology of the small intestine (jejunum mucosal development) of the broilers in different treatment groups. Compared to control group, the inclusion of either humic acid or esterified glucomannon decreased ($p < 0.01$) the crypt depth and increased villus height respectively ($p < 0.05$). More ever, the diet supplements with humic acid 0.3% (T4) decreased crypt depth compared to esterified glucomannan and control. The dietary supplementations resulted in an increase in the villus height of intestinal mucosa of broilers. The increase in the villus height was associated with improvement of growth performance for both humic acid and esterified glucomannan. Based on our results it appeared that humic acid and esterified glucomannan can be used as a growth promoter in broiler diets and they can improve the gut health too.

KEYWORDS

Broiler Chicks; Humic Acid; Esterified Glucomannan; Small Intestine

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