

Title *Evaluation of Comparative Effect of Zinc Bacitracin, Mannan Oligosaccharides and Lactobacillus on Broiler Performance, Gross Measurements of Major Organs and Intestinal Histomorphometry*

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Abstract:

This study was aimed to analyze the comparative effect of Zinc bacitracin (antibiotic), Mannan oligosaccharides (prebiotic) and Lactobacillus (probiotic) on growth performance, gross measurements of selected organs like gizzard, spleen, liver, small and large intestine and intestinal histomorphometric variables in broiler chickens.

Day-old broilers (n = 160) were randomly divided into four groups (A,B,C,D) each group with four replicates having 10 birds in each replica. Group A (Control group) was fed basal diet while Group B, C and D were fed same feed with 0.04% Zn bacitracin, 0.1 % Mannan oligosaccharides and 0.1 % Lactobacillus based probiotic respectively for 35 days respectively.

During the trial, the birds were immunized with NDV and IBDV. Individual body weight of day old chicks was recorded upon arrival of chicks then subsequently on every week for body weight gain (BWG). Like that feed intake and the feed conversion ratio (FCR) were calculated per week.

On day 35 of experiment, eight birds per group were slaughtered and measurements, weight of liver, spleen, gizzard, small intestine and large intestine were recorded. Small and large intestinal lengths were also measured. Then tissue samples of duodenum, jejunum, ileum and ceca were collected for histology study. Samples were processed by paraffin embedding technique and were stained by using Haematoxylin and Eosin. The comparative effect of antibiotic, prebiotic and probiotic were studied on intestinal histomorphometric variables (villus height, width, villus surface area, crypt depth, lamina propria, muscularis mucosa, and muscularis externa thickness) including goblet cell, and IEL count. Results showed that in the starter phase (d 1 to d 21), the MOS supplemented group gained highest ($P < 0.05$) BW and least FCR. Whereas in the grower phase (d 21 to d 35) BW was highest ($P < 0.05$) and least FCR in the LBP supplemented group compared to ZnB supplemented and control groups.

Data revealed that there was no significant difference ($P > 0.05$) on absolute liver, gizzard and small intestinal weight among all groups. The weight of spleen was greater ($P < 0.05$) in the LBP supplemented group compared to all other groups. The large intestine weight was greater ($P < 0.05$) for MOS fed birds compared to control. Dietary supplementations of LBP increased ($P > 0.05$) the small intestinal length whereas, MOS increased ($P > 0.05$) the large intestinal length.

Dietary supplementations of MOS and LBP group increased ($P < 0.05$) the villus height in duodenum, jejunum, ileum as compared to ZnB supplemented and control group. Villus width was ($P < 0.05$) increased in duodenum among birds fed on MOS containing diet compared to all other groups. Villus surface area in duodenum and ileum was greater ($P < 0.05$) in MOS and LBP supplemented group compared to ZnB supplemented and control group. The results of the present study also revealed that ZnB treatment group had shorter ($P < 0.05$) villi in both duodenum and ileum.

Crypt depth, muscularis mucosa and muscularis externa thickness were not influenced in duodenum, jejunum and caecum. In ileum, crypt depth was decreased ($P < 0.05$) in LBP treatment group compared with the control. Muscularis mucosa and muscularis externa thickness were reduced in ileum in ZnB supplemented group compared with the control. In ileum, lamina propria thickness was greater ($P < 0.05$) in MOS treatment group compared with all other dietary treatments. Goblet cells counts were higher ($P < 0.05$) in LBP fed birds in duodenum and ileum