

PROTECTIVE EFFECTS OF BANGLADESHI PROBIOTIC STRAINS ISOLATED FROM NATIVE SCAVENGING CHICKEN AGAINST AVIAN COCCIDIOSIS

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Executive Summary

Coccidiosis is one of the major parasitic diseases in the commercial broiler industry. Probiotics can protect poultry against *Eimeria* infection. However, the mechanisms are not fully known. The study aimed to determine the probiotic efficacy of native isolates of *Lactobacillus salivarius* as probiotic in different doses to investigate their anticoccidial properties. Five hundred broilers were allocated to five treatments: control diet (NC), control diet *Eimeria* infection (IC), control diet containing 10^8 cfu/g Probiotic-I (low dose of *L. salivarius*) + *Eimeria* infection (P-I), control diet containing 10^{10} cfu/g Probiotic-II (high dose of *L. salivarius*) + *Eimeria* infection, and control diet + *Eimeria* infection + Aprotium (DC). At day 14, all treatments except NC were inoculated with sporulated oocysts. Results indicated that *Eimeria* infection increased the mortality and oocysts shedding, and declined the growth performance as well as the intestinal barrier in *Eimeria* - treated broilers. On the contrary, dietary supplementation of low level, high level *Lactobacillus salivarius* and DC decreased the mortality and oocysts shedding, but improved the growth performance and intestinal barrier. The impaired intestinal morphology in the IC group was also improved by probiotics and anticoccidial treatments. Besides, the elevated oxidative stress and pro-inflammation in *Eimeria* -infected broilers were reduced by P-I, P-II and anticoccidial treatments. Bacteriological analysis indicated *Lactobacillus salivarius* altered the structure of the gut microbiota, and the alteration was more obvious at day 21 than day 35. Notably, IC also increased the abundances of *Eimeria* species at day 21, while P-I and DC decreased the abundances. Correlation analysis revealed that bacteria in *Eimeria* -treated broilers positively correlated with the intestinal permeability, oxidative stress and inflammation, while bacteria in broilers receiving P-I and DC negatively correlated with the aforementioned pathological indices. In conclusion, dietary *Lactobacillus salivarius* supplementation inhibited oocyst shedding and improved the growth performance as well as the intestinal health of broilers infected with *Eimeria*, which was closely related to the regulation of gut microbiota. Moreover, the effects of *Lactobacillus salivarius* may be more effective in the early infection of coccidia.

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