
Research article

Impact of dietary supplementation with soybean bioactive peptides and vitamin E on certain gastrointestinal traits, nutrient digestibility, and digestive enzymes activity in broiler chickens

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Abstract: In this study, we aimed to evaluate the effects of supplementing broilers' diets with soybean bioactive peptides (SBP) and vitamin E (VE) on jejunum morphology, gastrointestinal traits, nutrient digestibility, and the activities of digestive enzymes. Day-old broiler chicks (n=180; Ross 308) were randomly assigned to five groups, with three replicates containing twelve chicks each. The group that served as the control received a standard basal diet (BD), while the experimental treatments (2, 3, 4) were fed the same basal diet (BD) supplemented with 2.5, 5, or 7.5 g/kg of SBP, respectively, and G5 received a BD with 250 mg of VE/kg. The results revealed that SBP supplementation significantly ($P \leq 0.05$) enhanced the digestion coefficient of protein, fat, and crude fiber (except 2.5 g/kg SBP). SBP supplementation had a significant ($P \leq 0.05$) effect on the small intestine, improving trypsin enzyme activity, protein efficiency ratio (PER), and feed passage rate (FPR). It also enhanced gut structure by increasing villi height and crypt depth in the jejunum compared to the control. The results showed that VE supplementation significantly ($P \leq 0.05$) improved the protein coefficient and PER compared to the control. Moreover, compared to the control, incorporating SBP or VE had a non-significant effect on the relative weight, relative length, and weight-to-length ratios of the gastrointestinal tract, small intestine, cecum, and amount of protein intake of broilers. Thus, supplementation of SBP at 2.5 g/kg positively affects trypsin activity, PER, FPR, and gut morphology. Moreover, levels of 5.0 and 7.5 (g/kg) not only improve these qualities but also enhance nutrient digestibility in the broiler gut.

Keywords: Ross 308; feed passage rate; SBP; jejunum morphology