

Effects of vitamin E, inorganic selenium, bacterial organic selenium, and their combinations on immunity response in broiler chickens

ABSTRACT

Background: Selenium (Se) and vitamin E (Vit E) can act synergistically and affect biological processes, mainly antioxidant and immunity. The use of excess dietary Vit E and Se in animals' feed could enhance immune response and induce disease resistance. Moreover, different Se sources may provide different alterations in the immune system. Accordingly, the aim of the current study was to assess the impact of dietary supplementation of Vit E, inorganic Se (sodium selenite, SS), bacterial organic Se of ADS18, and their different combinations on the plasma immunoglobulins, caecum microbial population, and splenic cytokines gene expression in broiler chickens. Results: Present results showed that, Se and Vit E synergistic effect was clear in plasma IgM level at day 42 and in splenic cytokines expression (TNF- α , IFN- γ , IL-2, IL-10). The combination of 0.3 mg/kg ADS18-Se with 100 mg/kg Vit E showed the highest IgM level compared to Vit E- SS complex. The combination of either SS or ADS18-Se with Vit E had no significant effect on IFN- γ and IL-10 compared to Vit E alone, while Vit E alone showed the significantly lowest TNF- α compared to the Se combinations. Supplementation of 100 mg/kg Vit E had no effect on microbial population except a slight reduction in Salmonella spp. The main effect of Se sources was that both sources increased the day 42 IgA and IgG level compared to NS group. ADS18-Se modulate the caecum microbial population via enhancing beneficial bacteria and suppressing the E-coli and Salmonella spp. while both Se and Vit E factors had no effect on lymphoid organ weights. Conclusions: The inclusion of 100 mg/kg Vit E with 0.3 mg/kg ADS18-Se, effectively could support the immune system through regulation of some cytokines expression and immunoglobulin levels more than using ADS18-Se alone, while no difference was observed between using SS alone or combined with Vit E.

Keyword: Bacteria; Broiler; Cytokines; Immunity; Selenium; Vitamin E.