

## **Omega-3 polyunsaturated fatty acids enrichment alters performance and immune response in infectious bursal disease challenged broilers.**

### ABSTRACT

Background Infectious bursal disease (IBD) results in economic loss due to mortality, reduction in production efficiency and increasing the usage of antibiotics. This study was carried out to investigate the modulatory roles of dietary n-3 polyunsaturated fatty acids (PUFA) enrichment in immune response and performance of IBD challenged broiler chickens. Methods A total of 300 day old male broiler chicks were assigned to four dietary n-3 PUFA ascending levels as the treatment groups (T1: 0.5; T2: 8.0; T3: 11.5; T4: 16.5) using combinations of tuna oil and sunflower oil. All diets were isocaloric and isonitrogenous. On day 28, all birds were challenged with IBD virus. Antibody titer, cytokine production, bursa lesion pre and post-challenge and lymphoid organ weight were recorded. Results On d 42 the highest body weight was observed in the T2 and T3 and the lowest in T4 chickens. Feed conversion ratio of the T2 broilers was significantly better than the other groups. Although productive parameters were not responded to the dietary n-3 PUFA in a dose-dependent manner, spleen weight, IBD and Newcastle disease antibody titers and IL-2 and IFN- $\gamma$  concentrations were constantly elevated by n-3 PUFA enrichment. Conclusions Dietary n-3 PUFA enrichment may improve the immune response and IBD resistance, but the optimum performance does not coincide with the optimum immune response. It seems that dietary n-3 PUFA modulates the broiler chicken performance and immune response in a dose-dependent manner. Thus, a moderate level of dietary n-3 PUFA enrichment may help to put together the efficiency of performance and relative immune response enhancement in broiler chickens.

**Keyword:** n-3 PUFA; Immune response; IBD; Broiler.