

## **Abstract**

In this research, the response of native and commercial turkeys to different levels of dietary crude protein (CP) and threonine amino acid (Thr) was studied in two separate experiments. In the first experiment, the response of native turkeys and in the second experiment, the response of Nicholas 300 turkeys to different levels of CP and Thr from 4 to 8 weeks of age was studied. A total of 160 native and Nicholas male turkeys were completely randomized design as factorial arrangement 2×5 via two levels of CP (100% recommendation of NRC (1994); 26% and 90% recommendation of NRC (1994); 23.4%) and 5 levels of total Thr (0.75, 0.85, 0.95, 1.05 and 1.15% of diet) were fed from 4 to 8 weeks. In the first experiment: CP level dose not significant effect on the performance parameters during the growth period ( $P>0.05$ ). Level of 1.05% Thr increased the body weight (BW) and weight gain (WG) and decreased the feed conversion ratio (FCR) ( $P<0.05$ ). There was a significant interaction effect between CP and Thr ( $P = 0.015$ ) for WG during growth period. Main effects level of 26% CP and Thr at levels of 1.05 and 1.15%, significantly decreased in native turkeys ( $P<0.05$ ). However, superoxide dismutase(SOD) enzyme activity, cellular immune response and blood parameters, except of serum protein concentration, were not affected by CP and Thr different levels. The secondary challenge against sheep red blood cells (SRBC), main effect Thr on antibody titre was significant ( $P<0.05$ ) and increased in levels of 1.05 and 1.15% Thr. High levels of CP and Thr in diet improved nutrients digestibility of feces and ileal. Estimated requirements using linear broken line (LBL) regression for WG and FCR at the CP level of 26% were 0.929 and 1.048, respectively, and for diet of 23.4% CP, equal to 0.927% and 0.978%, and using quadratic broken line (QBL) regression 1.089 and 1.047 for WG in diets with 26 and 23.4% CP, respectively. Antibody titre against SRBC Thr requirement were 0.867 and 1.099 using LBL and QBL regressions in 23.4% diet, respectively. In the second experiment, level of 26%CP significantly increased WG and feed intake (FI). The higher levels of Thr increased significantly BW and WG and decreased FCR( $P<0.05$ ). There was no significant difference between experiment diets in terms of SOD activity, cellular and humoral immune response, and blood parameters ( $P>0.05$ ), and only serum albumin concentration was decreased by lower level of CP in the diet ( $P<0.05$ ). The level of CP of 26% and Thr of 1.05% significantly decreased liver MDA concentration ( $P<0.05$ ). High levels of CP and levels of 1.05 and 1.15% Thr in diet, had higher ileal CP digestibility and feces digestibility of DM and OM. With increment Thr levels, globulin concentration increased and albumin levels in serum decreased ( $P<0.05$ ), However, Thr level did not significantly affect lipid profile, glucose and uric acid level ( $P>0.05$ ). Using LBL regression Thr requirements for best response in the diet of 26% CP for WG, FCR were 0.868, 0.954, respectively, and for 23.4% CP level were 0.866 and 0.95, respectively. Antibody titre against SRBC Thr requirement was 1% of diet in 23.4% CP diet. Thr requirements for the max. WG in the diets containing of 26% and 23.4% CP were 0.914 and 0.908% of the diet using QBL regression, respectively.

**Keywords:** Turkey, Threonine, Requirements, Crude protein, Broken line models



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