EFFECTS OF VITAMIN E ON T CELLS IN GUT-ASSOCIATED LYMPHOID TISSUE (GALT) OF BROILER CHICKENS UNDER HEAT STRESS

Sadiye Kum[1], Ulker Eren[1], Deniz Korkmaz[1], Mustafa Sandikci[1], Isil Aydemir[2]

[1]Department of Histology and Embryology, Faculty of Veterinary Medicine, University of Adnan Menderes 09016, Isikli, Aydin, Turkey, tel. +9002562470700
[2]Department of Histology and Embryology, Faculty of Medicine, University of Celal Bayar 45016, Manisa, Turkey, tel. +900232331920
Corresponding Author: skum@adu.edu.tr; sadiyekum@gmail.com

Abstract. The aim of this study was to explore the effects of vitamin E on T cells number and distribution within GALT (Gut associated lymphoid tissue) in broiler chickens submitted to heat stress. For that, the CD3, CD4 or CD8 positive cells were investigated by immunohistochemistry in the oesophageal, pyloric, jejunum, ileum and caecal tonsils from 4, 5, 6 weeks old Ross 308 male broilers reared under standard temperature conditions (22 ± 2°C) (group C) or submitted to heat stress (35°C for 5 hours per day) (group HS) and eventually treated with vitamin E (DL-α-tocopherol acetate, 300 mg/kg, (group HSE), each group containing 21 birds. Heat stress markedly depleted T cell population in GALT but the cell distribution was not modified. By contrast, the vitamin E treatment has considerably increased the T cell population by acting on all T cell types in every lymphoid area (inter-follicular zones, germinal centers, epithelial crypts). These results show that vitamin E can remarkably counteract the adverse effect of heat stress on the immune function and dietary vitamin E supplementation can be recommended in broilers, especially in the summer months.

Keywords: broiler chickens, heat stress, vitamin E, Gut-Associated Lymphoid Tissue, T cells