**Abstract**

Environmental stresses have a huge adverse effects on the performance of the poultry. Among domesticated animals, chicken are very sensitive to high environmental temperature; but compared to fast growing chicken breeds, native chickens was shown to be more resistance to the side effects of environmental stress on chicken health and performance. Thermal stress not only induces changes in various physiological and metabolic processes; but also induces the formation of free radicals in mitochondria, all of which negatively influences the poultry performance. At the same time, antioxidants was shown to play a key role in modulating the negative effects of free radicals on the both chicken health and performance. Glutathione peroxidase 4 (GPX4) is one of the most powerful endogenous antioxidant in the body that protects cell from against oxidative damage induced by heat stress. Furthermore, the small intestine is one of the most sensitive organs to the damaging effects of heat stress. Therefore the purpose of this study was to compare the relative expression pattern of glutathione peroxidase 4 antioxidant gene (GPX4) in the intestinal tissue of Khazak and Ross 308 chickens. For this purpose, a total of 108 broiler chicks of Ross 308 and 60 Khazak native chicken were categorized into experimental groups that were kept under both normal and heat stress condition for 42 days. They were weighted weekly and at the end of the growth period, 3 birds per each experimental groups were randomly selected and slaughtered for analysis of internal organs (chest, thigh, spleen, liver and bursa) weight. Relative expression of intestinal GPX4 gene was also compared between experimental groups using RT-PCR method. The results of this study indicate that heat stress condition cusese significangly upregulation of glutathione peroxidase (GPX4) gene in both of Khazak and Ross 308 intestinal tissue as compared to the normal condition ($p < 0.05$). Relative weight of all analysed internal organ, except to gizzard, was significantly influenced by heat stress condition in both of the Khazak and Ross 308 strains compared to the normal condition ($p < 0.05$). In both of normal and heat stress conditions, the relative expression of glutathione peroxidase4 (GPX4) gene was lower in Khazak chicken when compared to the Ross 308 broilers counterpart ($p < 0.05$). Based on the results of this study, both of chicken breed as well as environmental temperature was found to have significant effects on the expression patterns of intestinal glutathione peroxidase 4 gene ($p < 0.05$). The level of expression

of glutathione peroxidase 4 was found to be lowest in the intestine of Khazak chicken under normal conditions but was highest in the intestinal tract of Ross 308 broiler under thermal stress conditions ($p < 0.05$).

Keywords: Free radical, Heat stress, Oxidative stress

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# Comparison Expression Pattern of the Intestinal Antioxidant Glutathione Peroxidase 4 Gene in Khazak and Ross 308 Chicken.

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