Summary:

The process of cooling and freezing causes strong oxidative effects and with the production of reactive oxygen species (ROS), causes lipid peroxidation (LPO) in the sperm membrane and various physical and chemical changes and sperm cells and damages the sperm. . Oxygen free radicals affect the reproductive and physiological state of spermatozoa. Excessive production of free radicals has negative effects on sperm parameters such as motility and deactivation of glycolytic enzymes and damage to acrosome, which causes infertile sperm. Antioxidants play a protective role against oxidative stress. There are two types of antioxidants: enzymatic and non-enzymatic antioxidants. Enzymatic antioxidants include glutathione peroxidase (GPx), glutathione reductase (GR), superoxide dismutase (SOD) and catalase. Non-enzymatic antioxidants include reduced glutathione (GSH), urate, ascorbic acid, vitamin E, atocofrol, carotenoids (b-carotene), ubiquinones, taurine and hypotaurine, selenium, zinc. Trolox is an analog of vitamin E and it is an antioxidant, a radical scavenger, a signaling inhibitor, a neuroprotective agent and a ferroptosis inhibitor, and the purpose of this study is to investigate the effects of Trolox on the quality of semen during storage at 5 degrees. In this study, the ejaculates obtained from 4 studied dogs were divided into 4 groups: the control group (without antioxidant), the second group received 100 μM, the third group received 200 μM, and the fourth group received 400 μM Trolox. they did The evaluations included sperm motility, DNA integrity, survival rate, sperm plasma membrane continuity at 0, 24, 48 and 72 hours. The results indicated that in general mobility at 48 and 72 hours, Trolox 200 micromolar group had the highest percentage of general mobility and progressive mobility. In the evaluation of sperm viability at 24, 48 and 72 hours after the test, Trolox 200 and 400 μM groups had the highest percentage of viability compared to the control group. In the assessment of sperm plasma membrane continuity at 24 and 72 hours, there was no significant difference between the Trolox 200 and 400 micromolar groups, and the highest ($p<0.05$) sperm plasma membrane continuity was assigned to the control group. At 48 hours, Trolox 200 μM group was significantly ($p<0.05$) higher than other treatment groups. At 24, 48, and 72 hours after the test, it was shown that the lowest ($p<0.05$) amount of DNA damage was related to the Trolox 200 micromolar group.

Keywords: Trolox, semen, canine