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**Relationship of organic mineral supplementation and spermatozoa/white blood cells mRNA in goats**

**Short title:** Trace mineral role in spermatozoa and WBC mRNA expression in goats

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**ABSTRACT**

The antioxidant properties and the protective role of organic zinc (Zn) and copper (Cu) in white blood cells (WBCs) and spermatozoa were analysed through quantification of superoxide dismutase 1 (SOD1), catalase (CAT), glutathione peroxidase 4 (GPx4) and nuclear factor erythroid 2-like 2 (NFE2L2) and correlations were determined with sperm functional characteristics in Osmanabadi bucks. Bucks (aged 5 months;  $n = 40$ ) were divided into ten groups, and the dietary treatments comprised of a control and nine treatment groups as follows: organic Zn as Zn20, Zn40 and Zn60, organic Cu as Cu 12.5, Cu25, Cu37.5 and combined organic Zn and Cu as Zn20+Cu12.5, Zn40+Cu25, Zn60+Cu37.5, respectively per kg dry matter for a period of 8 months. The blood (120 and 240 days) and semen (240 days:

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