

## THE EFFECT OF EXOGENOUS MELATONIN ON ANTIOXIDATIVE ENZYMATIC ACTIVITY OF FRENCH ALPINE BUCKS SEMINAL PLASMA AND SPERMATOZOA DURING THE NON-BREEDING SEASON

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The aim of this study was to determine the effect of exogenous melatonin on antioxidative protection of bucks ejaculate during the non-breeding season by monitoring of antioxidative enzymatic activity, the ratios of antioxidative enzymes and the concentration of malondialdehyde (MDA) in seminal plasma and spermatozoa.

Twelve clinically healthy bucks of the French alpine breed aged from 1.5 to 4 years were randomly assigned into melatonin (MG) and control (CG) groups, with 6 bucks in each. The experimental period 3 months (March-May) was divided into six periods of 15 days each. The bucks in the MG group received four melatonin implants subcutaneously in the ear basis at the end of March. Two semen samples were taken from the bucks by artificial vagina once per week. The activities of glutathione-reductase (GR), glutathione peroxidase (GSH-Px), superoxide dismutase (SOD), catalase (CAT) and concentration of malondialdehyde (MDA) were determined in seminal plasma and spermatozoa.

The MG bucks had significantly lower values of GR in the spermatozoa and the seminal plasma during almost all periods of the experiment. In addition, significantly lower activity of GSH-Px in the spermatozoa and higher in the seminal plasma were observed in the last period of the experiment as well as significantly lower value of SOD in spermatozoa during the last 3 periods of the experiment. The MG bucks had significantly higher values of the ratios: CAT/SOD, GSH-Px/SOD in the seminal plasma and spermatozoa during 6<sup>th</sup> period of the experiment. In addition, the same group of bucks had significantly lower values of the ratio: GR/GSH-px in the spermatozoa during 6<sup>th</sup> period and in the seminal plasma during 5<sup>th</sup> period of the experiment.

According to the obtained results it could be concluded that the exogenous melatonin changed the value of particular antioxidative enzyme activities in certain periods of the experiment, especially of GR and GSH-Px in the seminal plasma and the spermatozoa and SOD in spermatozoa. Also, the exogenous melatonin had an influence on the ratios of antioxidative enzymes in the seminal plasma and the spermatozoa, and thus, the precise determination of these ratios in the future could be considered as a better indicator of oxidative stress which may provide a better insight into adaptation and antioxidative status of the semen in regard to activities of single antioxidative enzymes. In this study the antioxidative status in French Alpine buck spermatozoa was established for the first time.

**Keywords:** EXOGENOUS MELATONIN, SEMINAL PLASMA, SPERMATOZOA, RATIOS OF ANTIOXIDATIVE ENZYMES, BUCKS