



KEY WORDS

- ✓ Ram
- ✓ Semen
- ✓ Vitamin D
- ✓ Testosterone
- ✓ Cryopreservation

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THE EFFECT OF VITAMIN D INJECTION ON POST-THAW SEMEN PARAMETERS AND TESTOSTERONE LEVELS IN NON-BREEDING RAMS

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THESIS ABSTRACT

In this study, the effect of vitamin D administration on serum testosterone levels and post-thaw sperm parameters was investigated in rams during the non-breeding season. Six rams were divided into two groups. The control group received 2 mL intramuscular physiological saline (PSS), while the treatment group was administered vitamin D3 (Provet-D3 Injectable Solution) at a dose of 1 mL/50 kg intramuscularly. The day of administration was considered "day0," and semen and blood samples were collected on days 0, 15, 30, 45, and 60. The samples were stored in liquid nitrogen (-196 °C). After thawing, analyses including motility, hypo-osmotic swelling test (HOST), DNA integrity (TUNEL), acrosome integrity (FITC-PNA), mitochondrial membrane potential (JC-1), and nitric oxide (NO) were performed. On days 30, 45, and 60, motility, HOST values, the percentage of cells protected from nitric oxide-induced oxidative stress, and mitochondrial membrane potential were significantly higher in the vitamin D group compared to the control ($p<0.05$). At the same time points, the rate of DNA damage (TUNEL test) was significantly lower in the vitamin D group. In addition, a positive correlation was found between vitamin D administration and serum testosterone levels. In conclusion, intramuscular vitamin D supplementation during the non-breeding season positively influenced sperm quality in rams, demonstrating protective effects on DNA integrity and supporting mitochondrial function.

APPLICATION AREAS OF THE THESIS RESULTS

At the end of this study, it was demonstrated that vitamin D administration could improve sperm quality and preserve DNA integrity in rams, thereby enhancing the fertility potential after cryopreservation. This finding may provide an important contribution to increasing the success rates of artificial insemination programs and ensuring the availability of high-quality semen throughout the year.

ACADEMIC ACTIVITIES

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