

**Summary of the DVSc thesis No. 14184, Faculty of Veterinary Medicine, Urmia University.**

**The academic year:** 2023-2024

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**Title of thesis:** Evaluation of co-supplementation of Rutin in Simmental bull semen extender: Evaluation of kinetic parameters, sperm quality

**Abstract:**

This study investigates the effects of cryopreservation and supplementation of Simmental bull's semen with Rutin. Therefore, this study aimed to assess motility parameters, sperm viability, oxidative stress parameters, and DNA damage to detect the optimum concentrations of Rutin for Simmental bull semen cryopreservation. Freezable sperm samples were collected and divided into twelve groups: two control groups without receiving rutin with 4% and 7% glycerol concentration, the third group with 0.2 mM rutin concentration + 7% glycerol, the fourth group with rutin concentration. 0.4 mM + 7% glycerol, the fifth group with 0.6 mM rutin concentration + 7% glycerol, the sixth group with 0.8 mM rutin concentration + 7% glycerol, the seventh group with 1 mM rutin concentration + 7% glycerol, 8th group with 0.2 mM rutin concentration + 4% glycerol, 9th group with 0.4 mM rutin concentration + 4% glycerol, 10th group with 0.6 mM rutin concentration + 4% glycerol, 11th group with 0.8 mM rutin concentration molar + 4% glycerol, twelfth group with 1 mM rutin concentration + 4% glycerol. The obtained results showed that the addition of 0.4 and 0.6 mM of rutin significantly improves total motility, progressive motility, and plasma membrane integrity, total antioxidant capacity, reducing damage to sperm DNA, sperm viability and motility characteristics, except STR, compared to the control group. In conclusion, supplementation with Rutin in cryopreservation medium protects Simmental bull sperm against ROS attack by enhancing the antioxidative defense. Therefore, we conclude that the addition of 0.4 and 0.6 mM rutin to the Simmental bovine sperm cryopreservation extender can improve post-freezing sperm quality and may improve conception rates after artificial insemination with frozen sperm.

**Keyword:** Rutin, kinetic parameters, sperm quality, Simmental bull