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INVESTIGATION OF DITHIOTHREITOL AND SUCROSE IN BULL SEMEN
CRYOPRESERVATION*

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Abstract:

The cryoprotectants are added to extenders to protect the sperm from damage during freezing process. There are few studies performed for investigating the roles of dithiothreitol (D) or sucrose (S) at different ratios on sperm motility characteristics and antioxidant capacities of post-thawed bull spermatozoa. The objectives of this study were to analyze the effects of adding D or S (with/without) as antioxidants and ethylene glycol (EG) as cryoprotectant in Tris extender for cryopreservation of bull semen.

Totally 24 ejaculates were collected from the Three Holstein bulls with the aid of an artificial vagina. A Tris-based extender (T) and EG 5% was used as the base for the experimental extenders. Each ejaculate was split into three equal aliquots and diluted using both of 25 mM sucrose (S) or 5 mM dithiothreitol (D), and control (without additives).

When compared to the control, addition of different antioxidants did not significantly increased the percentages of post-thaw sperm progressive and CASA motilities, acrosome abnormality and plasma membrane integrity ($P>0.05$). Control group gave the lowest MDA but, these results were not supported with the GPx activity ($P<0.01$). Sperm motion characteristics such as VAP, VCL, ALH and BCF gave significantly different results except for VSL and LIN ($P<0.05$). D and S were showed better DNA integrity than control.

In conclusion, it may be stated that, using D improved the GPx activity. On the other hand, the addition of antioxidants protected tail moment.

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Keywords: Antioxidant activity, Ethylene glycol, Sperm.