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COMPARISON OF CRYOPROTECTIVE EFFECTS OF TREHALOSE AND CYSTEINE ON BULL SEMEN

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Abstract:

The major factor affecting the results of insemination with frozen–thawed semen is the addition of cryoprotectants. There are only a few studies performed for exploring the effects of trehalose (T) or cysteine (C) at different ratios on sperm motility characteristics and antioxidant capacities of post-thawed bull spermatozoa. The objectives of this study were to assess the effects of adding T or C as antioxidants and glycerol (G) as a cryoprotectant in Tris extender for cryopreservation of bull semen.

Totally 24 ejaculates were collected from the three Holstein bulls. A Tris-based extender (T) was used as the base for the experimental extenders. A Tris-based extender (T) and G 7% was used as the base for the experimental extenders. Each ejaculate was split into three equal aliquots and diluted using both of 25 mM trehalose (T) or 5 mM cysteine (C), and control (without additives).

When compared to the control, addition of different antioxidants significantly increased the percentages of post-thaw CASA motitilities ($P > 0.05$), but did not any effect acrosome and total abnormality and MDA activity ($P > 0.05$). Control group gave the highest plasma membrane integrity ($P > 0.05$). And C showed lowest GPx activity ($P < 0.001$) (Table 1). Sperm motion characteristics such as VAP, VCL, ALH and BCF gave significantly different results except for VSL. T and C were showed better DNA integrity than control ($P > 0.05$) (Table 2).

In conclusion, it may be stated that, using C did not improved the GPx activity. On the other hand, the addition of T and C protected the DNA integrity.

Three Holstein bulls were housed at Research Institute. Totally 24 ejaculates were collected from the bulls. A Tris-based extender (T) was used as the base for the experimental extenders. Each ejaculate was split into four equal aliquots and diluted using both of the T extenders . After that, each extenders were split into three equal aliquots and diluted using both of %7 G with 25 mM trehalose (S) or 5 mM cysteine (C), and control. The present study was undertaken to ascertain which cryoprotectant and antioxidant would provide the most effective protection against cold shock and oxidative damages during the cryopreservation process.

In conclusion, compared to the cryoprotectant groups in this study, the use of C or T in the extender did not eliminate MDA production and adding 5 mM C in all cryoprotectant groups decreased GPx antioxidant activ-ity during the cryopreservation process ($P < 0.001$). And glutathione peroxidase (GPx) antioxidant activity was increased in the C-treatment groups when compared to the other groups.

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Keywords: Sperm, antioxidantactivity, trehalose, cysteine.