Effect of sugars on characteristics of Boer goat semen after cryopreservation

ABSTRACT

In order to improve Boer goat semen quality during cryopreservation process, the influence of sugar supplementation on semen characteristics of sperm were investigated. Three experiments were carried out to investigate the effect of (a) addition of two monosaccharides (fructose and glucose) and two disaccharides sugars (trehalose and sucrose) (b) sugar combination (fructose and trehalose, sucrose and trehalose, glucose and trehalose), and control (glucose without trehalose) (c) different concentrations of trehalose on cryopreservation using Tris based extender. The total motility, forward motility, viability, normal spermatozoa, acrosome integrity and membrane integrity were assessed subjectively. Differences were not detected among monosaccharides, but glucose increased ($P < 0.05$) sperm forward motility in post-thaw goat semen compared to trehalose or sucrose supplementation. Semen quality did not differ ($P > 0.05$) among disaccharide sugar supplementation. Combination of glucose and trehalose significantly improved the characteristics of Boer spermatozoa after cryopreservation ($P < 0.05$). Supplementation of trehalose (198.24 mM) into the glucose extender significantly increased total motility, forward motility, live spermatozoa, acrosome integrity and membrane integrity following cryopreservation ($P < 0.05$). In conclusion, glucose had the better ability to support Boer sperm motility and movement patterns. Combination of monosaccharide (glucose) and disaccharide (trehalose) improved semen quality following cryopreservation. Trehalose supplementation at the concentration of 198.24 mM to the glucose extender conferred the greater improvement of semen quality for Boer semen cryopreservation.

Keyword: Boer goat; Semen; Cryopreservation; Sugar; Trehalose