The effects of Binder of SPerm protein supplementation on cryopreserved epididymal ram spermatozoa

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Abstract

Cryopreserved ram semen results in acceptable fertility only if deposited directly into the uterus via laparoscopic artificial insemination. The expense of this technique has prevented wider use of frozen thawed semen within the sheep industry and as such means to improve the function of frozen-thawed ram spermatozoa to facilitate cervical insemination have long been sought. The aim of this study was to determine the post-thaw effects of pre-freeze supplementation of epididymal ram spermatozoa with Binder of SPerm (BSP) protein 1 and 5. The effects of BSP supplementation were identified by assessing sperm motility and quality parameters (viable cells, membrane disorder, acrosome integrity and intracellular reactive oxygen species (ROS) production). BSP supplementation improved progressive motility and velocity of spermatozoa, and the percentage of viable cells. BSP proteins mediated the rate of ROS production, despite increasing the overall production of intracellular ROS and levels of membrane disorder. BSP5 supplementation improved acrosome integrity, whilst BSP1 was detrimental. This study has been the first to investigate the effects of BSP supplementation on cryopreserved ram spermatozoa, and demonstrate their potential antioxidant like capacity and ability to improve viability and motility parameters.