Cryopreservation and fertility of Bighorn (Ovis canadensis c.) cauda epididymis semen
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Bighorn sheep (Ovis canadensis canadensis) have high morbidity and mortality rates due to Pasteurella/Manhemia spp. pneumonia when they come into contact with domestic sheep (Ovis aries). We have reported previously the production of hybrid pregnancies between the two species using laparoscopic insemination with fresh semen. The objective of the present experiment was to determine the fresh and post-thaw quality and fertility of cauda epididymis semen collected postmortem from Bighorn rams that were suffering from pneumonia.

Four Bighorn rams were exposed to domestic sheep for a period of 30 days as part of a study on pneumonia. Rams were euthanized immediately if severely ill or upon completion of the study. The testicles were collected within the scrotal sac and processed within six hours of death. The cauda epididymis was dissected and semen was harvested by float-up technique following mincing. A commercial ovine freezing extender (IMV Technology, St Paul, MN) with 20% egg yolk was used for semen harvesting and freezing. Semen was diluted to provide approximately 100 million spermatozoa per mL then cooled slowly to 5 °C and equilibrated for 3h at this temperature before freezing. Semen was frozen in 0.5 mL French straws placed 4 cm above liquid nitrogen for 20 min then plunged in liquid nitrogen. Morphology was evaluated after 10 min of incubation at room temperature following collection. Progressive motility was evaluated immediately before cooling and after thawing (37 °C for 30 sec). To evaluate fertility frozen-thawed samples were used to laparoscopically inseminate (LAI) eight estrous synchronized ewe-lambs as described previously. Pregnancy diagnosis was performed by ultrasonography at 30 days.

All samples obtained showed very high progressive motility (>80%) and high normal morphology (>90%). There was no significant difference in semen quality amongst rams (P<0.05) despite the fact that some had had a fever of 40.5 °C (105 °F) for up to five days before euthanasia. The mean (±SEM) percent post-thaw progressive motility was 63.7 ± 1.8. Three ewes became pregnant following LAI. Two lambed twins after 155 and 156 days gestation, respectively. The third ewe lambed triplets at 156 days. Lamb weight varied from 1.9 to 3.4 kg. These results show that Bighorn cauda epididymis semen maintain fertility after cryopreservation. This technique could be used to preserve genetic diversity in Bighorn flocks if the testes are collected from sick or dying wild males in a timely manner.

Keywords: Genetic preservation, insemination, sheep, laparoscopy, hybrids

Reference