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Investigating the effect of utilizing epididymal sperm in the process of ovine in vitro embryo production process on the developmental competency of the embryos following embryo transfer

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Abstract

In vitro production of embryos (IVEP) and embryo transfer (ET) have been utilized in various livestock and showed to have a potential to enhance production efficiency and accelerate genetic gain. The sperm recovered from the cauda epididymis is an important source of gametes in valuable males and endangered species. The present study was aimed to optimize ET of ovine IVP embryos and to make it applicable and to investigate the developmental competence of IVP embryos using epididymal sperm following ET. At first, the estrous cycle of embryo recipient ewes was synchronized using CIDR for 12 days. At the time of CIDR removal, 400 IU PMSG was injected to the recipient ewes. A day after CIDR removal, in vitro embryo production was initiated in epididymal sperm group (749 oocytes in 6 replicates) and ejaculated sperm group (540 oocytes in 4 replicates). Nine days after CIDR removal, semi-laparoscopic embryo transfer was performed and 2 blastocysts were transferred to the uteri of recipients (38 recipients in epididymal sperm group and 32 recipients in ejaculated sperm group). Forty-four days after embryo transfer, ultarsonographic embryo detection was performed. There were no significant differences between epididymal sperm and ejaculated sperm groups regarding in vitro embryo development indices (cleavage rate: 83±1.7% vs. 71.9±3.27%; blastocyst rate: 39.8±1.3% vs. 33.5±1.31%, respectively), pregnancy rate (50% vs. 45.7%, respectively), lambing rate (25% vs. 21.9%, respectively), and other evaluated indices. The methods used in the present study can be used to transfer sheep embryos in farm conditions. Also, based on the results of this study, it can be concluded that there is no significant difference in the developmental ability between epididymal sperm and ejaculated sperm in sheep.

Key words: Laparoscopy, Pregnancy, Lambing rate, Epididymal sperm, Ejaculated sperm

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