Developmental competence of early caprine embryos vitrified with various cryoprotectant formulae and equilibrium time [1]

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Abstract

The objective of this study is to examine the effects of different cryoprotectant formulas on the development of post-thawed caprine embryos vitrified at early developmental stage. Early stages of embryos were collected from the oviducts of superovulated does by surgical method on days 2-3 after natural mating. In Experiment 1, 4-, 8- and 16-cell stage embryos were vitrified in solution containing 16.5% EG + 16.5% DMSO. In Experiment 2, 8-cell stage embryos were vitrified in solution containing 16.5% EG + 16.5% DMSO or 20.0% EG + 20.0% DMSO. In Experiment 3, 4-cell stage embryos were vitrified in solution with 20.0% EG + 20.0% DMSO or 25.0% EG + 25.0% DMSO. In Experiment 4, 4-cell stage embryos were equilibrated with various period time before vitrification in 20.0% EG + 20.0% DMSO. The morula rates of vitrified-thawed embryos at 4, 8 and 16-cell stages in Experiment 1 were 0, 22.0 and 50.0%, respectively. No embryos developed to the blastocyst stage. In Experiment 2, the morula and blastocyst rates of 8-celled embryos vitrified in 16.5% EG + 16.5% DMSO and 20.0% EG + 20.0% DMSO were 9.1% and 0% and 20.0% and 6.7%, respectively. In Experiment 3, the cleavage and blastocyst rates of 4-celled embryos vitrified in the solution containing 20.0% EG + 20.0% DMSO and 25.0% EG + 25.0% glycerol were 26.1% and 4.3%, 11.1% and 0%, respectively. In Experiment 4, the cleavage and blastocyst rates of 4-celled embryos balanced for 45 and 35 seconds prior to vitrification in the solution containing 20.0% EG + 20.0% DMSO were 25% and 0%, 33.3% and 12.8%, respectively. These results indicate that early stage embryos are able to successfully develop to the blastocyst stage after vitrification in the solution containing 20.0% EG + 20.0% DMSO and equilibrating for 35 seconds prior to vitrification.

Key word: Goat, Early stage embryo, Micro-drop vitrification, Developmental competence of embryo.

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