

Effect of Equilibration Temperature on In vitro Viability and Subsequent Embryo Development of Vitrified-Warmed Immature Bovine Oocytes

ABSTRACT

Problem statement: Vitrification is replacing conventional slow freezing to cryopreserve gametes and embryos especially for in vitro production of embryo in domestic animal species. However, the results are still not satisfactory. The aim of this experiment was to study the effect of different equilibration temperatures on in vitro viability of immature bovine oocytes after vitrification. **Approach:** Oocytes were obtained from slaughterhouse ovaries. Only grade one oocytes were used. Oocytes were equilibrated in three different temperatures: 32, 37, or 41°C. Immature oocytes were equilibrated in VS1 (7.5 Ethylene Glycol (EG) + 7.5% DMSO) for 10-12 min and then exposed to VS2 (15% EG + 15%DMSO + 0.5M sucrose) for one min. Thereafter oocytes were loaded on hand-made Cryotop and directly plunged into liquid nitrogen. After warming, oocytes were examined for viability, maturation, cleavage and blastocyst production. **Results:** Oocytes that were equilibrated at 37°C had significantly higher ($p<0.05$) viability than 41°C, but there were no significant difference between 37 and 41 with 32°C. Maturation rate in 37°C group was significantly higher compared with other groups. The highest percentage of degenerated and germinal vesicle stage oocytes were obtained from 41°C than 32 and 37°C. Cleavage rate of 37°C group (38.77%) was greater than other groups (30.84 and 28.95% for 32 and 41°C, respectively). The highest blastocyst rate was also produced when oocytes equilibrated at 37°C (6.45%). **Conclusion:** In conclusion, these results indicated that immature bovine oocytes can be equilibrated successfully at 37°C while higher or lower temperature can significantly decrease their subsequent viability and development.

Keyword: Vitrification, equilibration temperature, bovine, immature oocytes