

Development of bovine embryos cultured with media containing glucose (*Desenvolvimento de embriões bovinos cultivados em meios com glicose*)

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Introduction

Blastocyst (BL) expansion and blastocoel formation are coupled with increase in the glucose (GLU) metabolism, which is higher in morphologically normal than in degenerate embryos (Rieger et al., 1992). This study aimed to determine the dose level and duration of addition of GLU to culture medium that ensures the best results in development of in vitro produced bovine embryos.

Material and Methods

The study was carried out in the IVF Laboratory of the Dept. of Physiology and Pharmacology of the College of Vet. Med., The University of Georgia, USA. Procedures of oocyte recovery, incubation, in vitro maturation, sperm preparation, IVF and in vitro culture (IVC) as well as all formulae employed are described in Keskinetepe et al. (1995). 182 cumulus-oocyte complexes were handled. Experimental groups were: Tc- control; T_I - addition of 1.5mM of D-glucose (dGLU) in IVC medium (mSOF) between 18h and 48h post-insemination (pi); T_{II} -3.0mM of dGLU in mSOF 18-48h pi; T_{III} - 1.5mM of dGLU in mSOF 18-72h pi; T_{IV} -3.0mM of dGLU in mSOF 18-72h pi; T_V -4.5mM of dGLU in mSOF 18-72h pi. Cleavage rates (CR) were recorded and embryos assessed at days 7 and 9 pi. Differences were assessed through χ^2 analysis.

Results and Discussion

CR for T_I (21/24 =87.5%) did not differ from T_{II} (09/11 = 81.8%) but was higher (P<.05) as compared to other groups. CR of Tc (40/63; 63.5%), T_{II}, T_{III} (15/30; 50.0%), T_{IV} (16/20; 80.0%) and T_V (26/34; 76.5%) did not differ (P>.05) amongst each other. BL recovery on Day-7 was similar (P>.05) for Tc (10BL; 25%), T_I (9BL; 42.8%), T_{II} (3BL; 33.3%), T_{III} (3BL; 20%) and T_{IV} (3BL; 18.7%). However, Day-7 development of T_V embryos was retarded (2 BL; 7.7%). T_I tended (P<.10) to produce more (12; 57.1%) hatched (HB) or HB-expanded blastocysts (XB) on Day-9 than Tc (1BL+11HB+1XB; 32.5%), T_{II} (3HB+1XB; 44.4%), T_{III} (4HB+1XB; 33.3%), T_{IV} (3HB; 18.7%) and T_V (1HB+1XB; 7.7%). In conclusion, GLU in the concentrations and intervals studied did not impair cleavage and 1.5 or 3.0mM of GLU in mSOF between 18-48h pi had positive effect on cleavage and tended (P<.10) to improve the production of blastocysts.

References

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Palavras-chave: Bovino, embriões, clivagem, meio de cultura, glicose.