

Selection of Developmental Stages of Bovine in vitro-Derived Blastocysts Prior to Vitrification and Embryo Transfer: Implications for Cattle Breeding Programs

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Abstract : Identification of the most suitable stages of bovine in vitro-derived blastocysts (early, expanded and hatching) prior to vitrification is a straightforward process that facilitates the decision as to which blastocyst stage to use for transfer of fresh and vitrified embryos. Research on in vitro evaluation of suitable stages has shown that the more advanced developmental stage of blastocysts is recommended for fresh embryo transfer while the earlier stage is proposed for embryo transfer following vitrification. There is, however, limited information on blastocyst stages using in vivo assessment. Hence, the aim of the present study was to determine the optimal stage of a blastocyst for vitrification and embryo transfer through a two-step procedure of embryo transfer followed by pregnancy testing at 35, 60 and 90 days of pregnancy. 410 good quality oocytes aspirated by the ovum pick-up technique from 8 donor cows were subjected to in vitro embryo production, vitrification and embryo transfer. Good quality embryos were selected, subjected to vitrification and embryo transfer. Subsequently, 77 vitrified embryos at different blastocyst stages were transferred to synchronised recipient cows. The overall cleavage and blastocyst rates of oocytes were 68.8% and 41.7%, respectively. In addition, the fertility and blastocyst production of 6 bulls used for in vitro fertilization was examined and shown to be statistically different ($P < 0.05$). Results of ongoing pregnancy trials conducted at 35 days, 60 days and 90 days will be discussed. However, preliminary data indicate that individual bulls demonstrate distinctly different fertility performance in vitro. Findings from conception rates would provide a useful tool to aid selection of bovine in vitro-derived embryos for vitrification and embryo transfer in commercial settings.

Keywords : blastocyst, embryo transfer, in vitro-derived embryos, ovum pick-up, vitrification

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