

Influence of time of onset of oestrus on embryo recovery in superovulated crossbred cows

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ABSTRACT

Superovulations were done with 2000 I.U. PMSG in 10 Sindhi Jersey cross bred cows on day 10 or 11 of the oestrous cycle and 25 mg of PGF₂ d was injected for oestrus synchronization 48 hours after the superovulatory treatment. A.I. with double dose of frozen semen was carried out at 60, 72 and 84 hours after the PG injection. Embryo were collected by adapting non-surgical procedure. The donor cows exhibited oestrus at 48 hours of PGF₂ injection produced more number of total and transferrable than cows exhibited oestrus before or after 48 hours of PG injection. It is concluded that time of onset of oestrus after PG injection has got influence on embryo recovery and quality of embryos in cross-bred cows.

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Superovulatory response by the donor cows in embryo transfer programmes is extremely variable (Donaldson, 1984). Optimum superovulatory response observed by Elsdon (1986) in superovulated cows exhibited oestrus at 48 hours post PGF₂α treatment which was higher than the exhibited oestrus before and 48 hours post PGF₂α treatment. Many authors observed that when PGF₂α was administered to superovulated cows, oestrus followed sooner than in non-superovulated animals and it was attributed to high oestrogen level in superovulated cows. This study was taken up to find out the influence of onset of oestrus on embryo recovery and the quality of embryos in superovulated crossbred donor cows.

MATERIALS AND METHODS

Ten Sindhi X Jersey crossbred cows, aged 4-8 years, body weight ranging from 250 to 310 kg, maintained in the embryo transfer scheme, Animal Biotechnology Department of Madras Veterinary College were used for this study. All the cows had calved atleast once and exhibited oestrus atleast twice after the last calving. The cows were maintained in high plane of nutrition. A total of 23 superovulations was done with 2000 IU of PMSG on these cows. Superovulation was done on day 10 or 11 of the oestrous cycle and 25 mg of PGF₂α were used for oestrus Synchronization at 48 hours after the PMSG injection. Artificial insemination with double dose of frozen semen was done three times at 60, 72 and 84 hours after the injection. The donor cows were classified, based on the time of onset of oestrus as Group 'A' (n=7) which exhibited oestrus within 48 hours, Group 'B' (n=10) which exhibited oestrus within 48 hours, Group 'B' (n=10) which exhibited oestrus at 48 hours and Group 'C' (n=6) which exhibited oestrus after 48 hours. Seven days after the first AI the uteri of all the cows were flushed and embryos collected non-surgically by adopting the ebb and flow method of New Comb *et al.*, (1978). Based on the morphological features observed through zoom stereo microscope the fertilized embryos collected were classified as transferable and non-transferable.

RESULTS AND DISCUSSION

The total and mean number of embryos recovered in crossbred donor cows exhibited oestrus within 48 hours, at 48 hours and after 48 hours were 22 and 3.14, 51 and 5.1 and 9 and 1.5. The percentage of transferable embryos recovered from the three groups was 50, 66.67 and 66.67 respectively. The donor cows exhibited oestrus prior to 48 hours post PGF₂ α injection produced more embryos but lesser percentage of transferable embryos than the animals that showed oestrus at or after 48 hours after the PG treatment. The donors that exhibited oestrus at 48 hours after PGF₂ treatment produced more embryos and also higher percentage of transferable embryos. But the animals that exhibited oestrus after 48 hours post PGF₂ α injection produced lesser number but higher percentage of transferable embryos. Similar observations recorded by Elsden (1986). Tervit *et al.*, (1973) claimed that the interval between PGF₂ α administration and oestrus was substantially shortened in superovulated cattle. Panchapakesan (1992) opined that the onset of oestrus was earlier in

superovulated cows and he attributed this to the high level of oestrogen due to multiple follicle development. Saumande (1975) confirmed that the increase in plasma oestradiol level in superovulated cows with PMSG reflected the number of growing follicles, correlated the Oestradiol 17B with number of ovulations. Datta *et al.*, (1992) reported that early oestrus in superovulated cows was due to early accelerated production of oestradiol-17B after gonadotrophin treatment. In animals exhibited oestrus beyond 48 hours produced very less number of follicles due to poor superovulatory response.

Regarding percentage of transferable embryos they were comparatively poor in animals exhibited oestrus earlier than at 48 hours and after 48 hours post PGF₂ α injection. This difference might have been due to high oestrogen level for a longer period in Group 'A' animals.

Based on this study, it is concluded that these types of variation observed in the onset of oestrus in superovulated donor cows may help to find out the superovulatory response of individual animal much earlier than embryo collection.

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