Short Communication

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ESTABLISHMENT OF PREGNANCY FROM SAHIWAL EMBRYO IN SURROGATE CROSS-BRED CATTLE

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SUMMARY

Multiplication of elite Sahiwal germplasm through transfer of its embryos in the cross-bred cattle was attempted.

Keywords: Cross-bred, multiple ovulation embryo transfer (MOET), Sahiwal

Sahiwal is considered as one of the best milch cattle breed and is well adapted to diverse Indian climatic conditions. However, rapidly declining population of Sahiwal cattle is the matter of concern for the vetrerinarians and because of this it is required to propagate the breed at faster genetic rate by utilising the multiple ovulation embryo transfer technology (MOET). The technique has been widely used to propagate *Bos taurus* but limited success is reported for its success in *Bos indicus* (Perry, 2015; Singhal *et al.,* 2017) which might be due to improper MOET methodology developed for indigenous cattle. Further, due to lesser availability of Sahiwal animals as recipients, it was hypothesised that whether a non-Sahiwal breed could serve the purpose of surrogacy for Sahiwal embryo. Therefore, the present preliminary experiment was planned to study transfer of *in-vivo* produced Sahiwal embryos in a non-Sahiwal breed recipient.

Two elite Sahiwal pluriparous normal cyclic cows with normal genitalia and a lactation yield of above 2500 Kg maintained at Directorate Livestock Farm, GADVASU, Ludhiana were selected as embryo donors. On random day of their estrous cycle, these cows received a combination of Estrogen (estradiol-17β = 2.5 mg) and Progesterone (hydroxy progesterone = 50 mg) intramuscularly and TRIU-B (progesterone implant = 958 mg P4) was kept in vagina irrespective of the day of estrous cycle. Four days after this, the animals were also administered 200 mg FSH (Folltropin-V) in divided eight doses of 40:40; 30:30; 20:20; 10:10 mg after every 12 hr daily for four days and PGF-2α (Estrumate- 2ml) was also administered along with 6th and 7th doses of FSH. The TRIU-B was removed on the day of last FSH injection. The animals were inseminated during the observed estrus twice at 24hr interval with frozen semen of the elite Sahiwal cattle bull. Superstimulatory response and ovulation rate were studied by trans-rectal ultrasonography at 5.0 MHz frequency. On day 7 following AI, embryo flushing was performed as per the standard procedure (Misra *et al.,* 1990). Embryo recovered following flushing were searched under zoom-stereo microscope and graded as per IELTS standard (Manual IETS, 2010). Embryos of good quality were transferred in pre-synchronised cross-breed cattle in the uterine horn ipsilateral to the ovary containing the corpus luteum (CL). These recipients were examined for non-return to heat and later pregnancy diagnosis using ultrasonography was done on day-50 of embryo transfer.

In the present study, a superstimulatory response of 19 follicles per cattle (Fig. 1) and ovulation rate of 84.2 per cent with 16 CL in each animal was observed. Similar to that of present study, an average of 21 follicles with 85.71% ovulation using 200 mg FSH was reported in Sahiwal (Singhal *et al.,* 2017), however a lesser superovulatory response of follicles (5-8) was recorded in indigenous cattle (Veerabramhaiah *et al.,* 2012). Dias *et al.* (2013) using double dose of Folltropin i.e. 400 mg observed a similar superstimulatory response in Nellore cattle but Carvalho *et al.* (2009) reported that a dose of 200 mg was best suited for MOET in Red Sindhi cattle.

Our study reported the average embryos recovery rate as 9.0 with Grade-1 (n=2), Grade-2 (n=2), Grade-3 (n=2) and Grade-4 (n=3) embryos. Similar to that of our study, a recovery rate of 7.39 embryos was reported by Patel *et al.* (2013) in indigenous cattle. Out of the good quality graded embryos, four were transferred as fresh embryos in pre-synchronised cross-bred recipient cattle. Two surrogate cross-bred animals which failed to exhibit heat following transfer were subsequently found pregnant at day 50 and day 90 following ultrasonography. A pregnancy rate of 50% (n=2/4) following embryo transfer was observed in the present study, however, a lower conception rate of 20% in Ongole (Kasiraj *et al.,* 2000), and 38.46% in Red Sindhi (Rangasamy *et al.,* 2015) was reported. But similar to our study, pregnancy rate of 57.14% with delivery of five calves was reported by Singhal *et al.* (2017). From the present study, it was observed that embryos of *Bos indicus* could produce pregnancy in *Bos taurus*, as the embryos of former are less sensitive to stress than later (Silva *et al.,* 2013).

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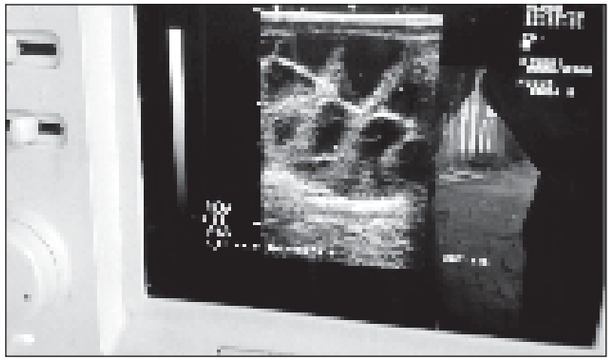

Fig. 1. Ultrasonographic image of ovary showing superstimulatory response

follicle-stimulating hormone doses on superovulatory response of Red Sindhi cows. *Reprod. Fertil. Dev*., **22:** 359.

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