

# A PRELIMINARY STUDY ON SUPERSTIMULATORY RESPONSE USING LOW DOSE FSH AND SUBSEQUENT EMBRYO TRANSFER IN SAHIWAL CATTLE DURING SUMMER SEASON

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## ABSTRACT

The superstimulation of two elite Sahiwal donors using 200 mg Follicle Stimulating Hormone (FSH, total dose) yielded on an average 21 follicles with ovulation of 18 follicles and recovery of nine embryos per cattle. Following transfer of eight fresh embryos in seven surrogate cattle, four became pregnant (pregnancy rate, 57.14%). Thus, FSH @ 200 mg can be used for superstimulation associated with fresh embryo transfer in Sahiwal cattle during summer season.

**Keywords:** Conception rate, FSH, Sahiwal, Summer, Superstimulatory response

The high genetic potential of Sahiwal cattle under Indian climatic conditions needs to be propagated at faster rate through embryo transfer technology (ETT). However, there is limited success of ETT in indigenous cattle due to low embryo recovery rate, variable superovulatory response, and poor conception rate (Baruselli *et al.*, 2006). Moreover, the information is not available regarding application of ETT in Sahiwal cattle during summer season. Thus, the present study in Sahiwal cattle during summer (May-June) season was carried out to investigate the efficacy of low dose FSH on superstimulatory response and subsequent embryo transfer.

Two elite Sahiwal cattle (lactation yield: 3325 kg and 3240 kg) maintained at an organised farm were selected as embryo donors. The animals were normal cyclic and free from any genital abnormality. Both the cattle were superstimulated with 200 mg FSH-NIH-P (Follitropin-V) divided in eight tapering doses (40:40; 30:30; 20:20; 10:10 mg) administered at 12 h interval for four days. Prostaglandin (PGF<sub>2α</sub>, Cloprostenol) was injected with the fifth and sixth dose of FSH. Using

frozen-thawed semen, fixed time AI was done at 12 h and 36 h after the last FSH. One day prior to embryo flushing, superstimulatory response was checked by ultrasonographic examination of ovaries. Embryo flushing was executed on day 7 after first AI using Worriën catheter (Misra *et al.*, 1990). The quality of embryos was screened under stereo-zoom microscope and were categorised as per IETS standards (Manual IETS, 2010). Thereafter, the embryos of good quality were transferred in pre-synchronised recipients of low genetic merit. About seven recipients received embryos (six with single and one with two embryo) on ipsilateral side of ovary with CL. The pregnancy diagnosis was conducted on day 55 after embryo transfer through ultrasonography.

The observed average superovulatory response using FSH @ 200mg was 21 follicles/cattle and ovulation rate was 85.71%. Similar observations using FSH @ 400 mg were reported in Nellore cattle (Dias *et al.*, 2013). Furthermore, the use of FSH @ 200 mg was suggested for superstimulation in Red Sindhi cattle (Carvalho *et al.*, 2009). However, a very low response in terms of superovulatory follicles (5-8) was observed using 200-250 mg FSH in indigenous cattle (Veerabramhaiah *et al.*, 2012). In present study,

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**Figure 1: Sahiwal donor cattle along with calves born through Embryo Transfer Technology at farmer's doorstep**

18-embryo (average 9 per cattle) were screened and were classified as Grade-1 (n=8), Grade-2 (n=3), and Grade-3 (n=7). Almost similar recovery rate of 7.39 embryos per cattle was reported earlier (Patel *et al.*, 2013). Authors have suggested that reproductive efficiency of Sahiwal is less affected by summer stress (Silva *et al.*, 2013).

Out of seven surrogate cattle that received the embryos, four became pregnant (pregnancy rate, 57.14%) and three recipients returned to estrus. In comparison to our study, about 20.0% conception rate in Ongole and 38.46% in Red Sindhi cattle was reported (Kasiraj *et al.*, 2000 and Rangasamy *et al.*, 2015). In present study, out of the four pregnant recipients, three delivered single calves and one surrogate calved twin males. Out of five normally delivered calves, four were from one donor (#S-444; Figure 1) and one was from other donor (#S-36).

In brief, in Sahiwal cattle during summer season, the administration of FSH @ 200 mg resulted into good superstimulatory response and an acceptable conception following embryo transfer.

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