

SUPEROVULATORY RESPONSE IN SAHIWAL x JERSEY CROSSBRED COWS WITH DIFFERENT DOSES OF FSHp

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ABSTRACT

Sahiwal x Jersey crossbred cows were superovulated with 250 and 200 mg FSHp from d10 to 13 of PGF_{2α} synchronized estrous cycle in divided doses and luteolysis on 72h after initiation of superovulatory treatment. All donors responded to superovulatory treatment and the mean ovulation rate, embryo recovery rate and anovulated follicles in 250 mg and 200 mg FSHp group were 4.67±0.33 and 3.50±0.34 (p<0.05); 2.33±0.33 and 2.00±0.26 and 3.17±0.17 and 2.00±0.45 (p<0.05), respectively. In brief, the superovulatory response was more in donor cows with 250 mg than 200 mg of FSHp.

Keywords: Embryo, FSHp, Ovulation, Sahiwal x Jersey crossbred cows, Superovulation

In Andhra Pradesh, Chittoor district is known for crossbred cattle population, however, an indiscriminate crossbreeding resulted in more exotic inheritance (75%). In order to stabilize the exotic blood level to 50%, Sahiwal x Jersey crossbred cows were introduced keeping in view the high milk producing efficiency of Sahiwal breed of indigenous cattle (Zafar *et al.*, 2008). To promote the population of superior cows, multiple ovulation and embryo transfer technology is one of the best methods but has a lot of variability in superovulatory response and quality of embryos. Therefore, it was proposed to reveal the effective dose of FSHp for good superovulatory response in Sahiwal x Jersey crossbred cows.

Twelve clinically normal, cyclic Sahiwal x Jersey crossbred cows (age, 6-10 yr; body wt., 350-450 kg) were selected and equally divided to superovulate with 250 mg FSHp (50/50, 35/35, 25/25 and 15/15 mg) or with 200 mg FSHp (40/40, 30/30, 20/20 and 10/10 mg) from d10 of estrous cycle, which was synchronized with double PGF_{2α} given 12d apart. Later on, all the donor cows were administered 500µg cloprostenol (PGF_{2α})

at 60h after initiation of superovulatory treatment. The animals were inseminated twice 24h apart at super estrus and the embryos were recovered non-surgically on d7 after superestrus. The superovulatory response was assessed using ultrasound scanner with 5.0-7.5 MHz linear-array transrectal transducer (Medicon, MAN 600SV-EP23300, Korea). After flushing the uterine horns, the flushed fluid was screened with the help of stereo-zoom microscope to locate the embryos and were graded (Hafez, 2008) for cryopreservation by Open Pulled Straw (OPS) method. The data obtained were analysed by using one way classification statistical analysis (Snedecor and Cochran, 1968).

All the donor cows responded to superovulatory treatment with 250 and 200 mg FSHp and resulted in development of follicles with mean number of follicles higher (p<0.05) in 250 mg group (Table 1), thus, reflecting the influence of higher dosage over ovarian response. The number of follicles developed in the present study were more than the reports of Baruselli *et al.* (2006) in Nellore cattle, but lower than the reports of Son *et al.* (2007) in Korean native cows. These results imply that *Bos indicus* breeds have greater sensitivity to exogenous gonadotropins though the

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number of follicles development is not equal to that of exotic breed (Baruselli *et al.*, 2006).

The mean number of ovulations were also higher ($p < 0.05$) in 250 mg group (Table 1). Similar results were reported in Anatolian black cattle by Tasdemir *et al.* (2012). On the contrary Rao *et al.* (2010) in Ongole cows and Nilchuen *et al.* (2012) in Kamphaengsean beef cattle obtained more number of corpora lutea. The variation in the number of corpora lutea after superovulation in both the groups may be attributed to more number of anovulation in 250 mg group (Table 1). Further, dissimilarities in the present study and with various studies might be due to variations in breed and their management, hormonal treatment and individual responses to hormonal stimuli (Rao *et al.*, 2010).

Table 1: Superovulatory response and recovery rate in Sahiwal x Jersey crossbred cows with 250 and 200 mg FSHp

Parameters	Superovulatory response	
	250 mg FSHp	200 mg FSHp
Total follicle	7.83±0.40 ^a	5.50±0.43 ^b
Total ovulation	4.67±0.33 ^a	3.50±0.34 ^b
Anovulatory follicle	3.17±0.17 ^a	2.00±0.45 ^b
Recovered embryo	2.33±0.33	2.00±0.26
Transferable embryo	1.67±0.21	1.17±0.31
Recovered ova	0.67±0.21	0.50±0.22

^{a vs b} $p < 0.05$

The mean anovulations per animal were also higher ($p < 0.05$) in 250 mg group (Table 1). These results revealed that the dose of FSHp is having significant role and thereby causing increase in the number of anovulatory follicles in cows receiving higher amount of FSHp (Deshmukh *et al.*, 2010) and this might be due to inadequate endogenous LH surge during superovulation (Kumar and Sait, 2011).

The total embryos and transferable embryos recovered were higher ($p > 0.05$) in 250 mg vs. 200

mg group cows (Table 1). Similar number of embryos were recovered in crossbred cows (Deshmukh *et al.*, 2010), but more number of embryos in Nondescript, Pabna and Friesian cows (Ali *et al.*, 2012), Ongole cows (Rao *et al.*, 2010) and Kamphaeng Sean beef cattle (Nilchuen *et al.*, 2012). The lesser yield of good quality embryos in 200 mg group cows might be due to the fact that the FSHp dose might not have induced satisfactory superovulation though it is well accepted that dose of FSHp in *Bos taurus* is 30 to 50% higher than dose recommended for *Bos indicus* cattle (Barati *et al.*, 2006) and also due to reduced fertilization rates in superovulated cows compared to normal cyclical cows, management of donor, genetic composition, nutrition, age, lactation phase, quality of semen and timing of the insemination (Stroud and Halser, 2006).

In brief, it is concluded that superovulation of Sahiwal x Jersey crossbred donor cows with 250 mg of FSHp is preferred over 200 mg of FSHp.

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