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Research Article

EFFECT OF FSH DOSE ON SUPEROVULATORY RESPONSE AND EMBRYO RECOVERY IN DANGI COWS

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ABSTRACT

The 16 normal healthy cyclical dangi donors were synchronized by injecting 0.75 mg of Iliren 11 days apart and superovulated by using 200 to 400 mg of FSH (Follitropin-V) in 8 divided tapering doses, for 4 days at 12 hr. interval. Embryos were recovered on 7 day of estrus. The DPBS with 0.04% Bovine Serum Albumin and evaluated as transferable and nontransferable. The mean superovulatory response for the FSH dose 200, 360 and 380 was 4.53 ± 0.60 , 4.15 ± 0.90 and 2.93 ± 0.60 , respectively. At the same time the viable embryo recovery was 2.53 ± 0.79 , 1.15 ± 0.78 and 0.16 ± 0.73 , respectively and total embryo recovery was 5.33 ± 1.30 , 4.23 ± 1.42 and 1.93 ± 0.58 , respectively. It is observed that at lower dose of FSH 200 mg the superovulation was better leading to increased total and viable embryo recovery but statistically not significant.

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INTRODUCTION

Dangi, one of the important cattle breeds of Maharashtra is rapidly reducing in number. Adaptability to extreme climate, hardiness, strong hooves and capacity to sustain on very poor quality feed are qualities of this breed making it popular amongst the farmers of the area. Absence of specific genetic improvement program and limited scope of marketing of this breed is forcing farming community to seek its replacement by crossbreeding it with the European breeds. The demand of the time is to select promising genotypes of the breed and speedily multiply it by freezing semen, if it is male and opting to Embryo collection and transfer (ET), if it is female. Breedwise variations need to be understood for standardizing ET procedures for recommendations. An attempt in the present investigation was therefore made to study effect of variable dose of FSH on superovulation and embryo yield in Dangi cattle.

MATERIALS AND METHODS

Sixteen normal healthy cyclical dangi donors were synchronized by injecting 0.75 mg of Iliren containing Tiaprost 0.150 mg/ml 11 days apart. The donors were superovulated by using 200 to 400 mg of Follicle Stimulating Hormone (Follitropin-V) in 8 divided tapering doses, for 4 days at 12 hr.

interval. These cows were bred thrice at 0, 12 and 24 hour of estrus using frozen semen of elite Dangi bulls. The superovulatory response was judged on previous day of flushing. Embryos were recovered on 7 day of estrus in the Dulbacco's Phosphate Buffer Saline added with 0.04% Bovine Serum Albumin by non surgical method. The collected embryos were evaluated as transferable and nontransferable using stereozoom microscope. The data was analysed statistically to draw the conclusions.

RESULTS AND DISCUSSION

The overall mean superovulatory response, unovulatory follicles, total embryo and viable embryo recovery recorded in Dangi cows was 3.86 ± 0.41 , 0.49 ± 0.11 , 3.81 ± 0.68 and 1.49 ± 0.39 respectively. The super ovulation response and embryo recovery observed in the present study was comparable to that observed by Chauhan *et al.* 1994 who noted mean ovulation rate, embryo recovery rate and transferable embryos to be 6.69 ± 0.73 , 2.19 ± 0.46 and 1.32 ± 0.31 , respectively in Jersey X Kankrej. Coelho, S. G. (1989) observed higher embryo recovery in Gir (average 5.5 per donor) and Nellore (average 7.4 per donor).. The number of viable embryos recovered were also higher (averages 3.2 and 4.4 respectively).

Mean superovulatory response and embryo recovery in Dangi cows for different dose of FSH is presented in Table 1. It can

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be noted from the table that Dangi cows responded better for super ovulation using lower dose of FSH. It was further noted that using FSH dose of 200 mg the mean super ovulatory response was (4.53 + 0.79), viable embryo recovery (2.53 + 0.79) and total embryo recovery was (5.33 + 1.30) was higher compared to the performance when dose of 360 mg. and 380 mg. was used, The respective figures for these doses were 4.15 + 0.90, 1.15 + 0.78 and 4.23 + 1.41 and 2.93 + 0.60, 1.93 + 0.58 and 0.73 + 0.358 respectively. Considering the large variations within and between groups, the data when analyzed using one way classification of analysis of variance for estimating the effect of hormone dose group on performance, the effect s were not significant (table 2).

Table 1 FSH dose wise superovulatory response and embryo recovery in Dangi donors

FSH dose(mg)	No. of donors	Superovulatory response				Embryo recovery			
		CL	SE	Follicle	SE	Viable	SE	Total	SE
200	15	4.53	0.60	0.53	0.79	2.53	0.79	5.33	1.30
360	13	4.15	0.90	1.15	0.78	1.15	0.78	4.23	1.42
380	15	2.93	0.60	0.40	0.16	0.73	0.35	1.93	0.58

Table 2 Analysis of variance. Showing the effect of FSH dose group on superovulatory response and embryo recovery in Dangi cows

Source of variation	Degree of freedom	Mean Squares				
		Corpus luteum	Follicle	Viable embryos	Non transferable embryos	Total embryos
Hormone dose group	2	10.40	0.09	13.19	14.86	44.97
Error	40	7.06	0.61	6.40	14.14	18.71

Since 43 embryo collections were effected from 16 donors, the assumption of effect of repeated flushing on the dose requirement of the same donor was verified by regrouping the data and Analysis of Variance including sequence of flushing group was carried out and the results are presented in Table 3.

Table 3 Analysis of variance. Showing the effect of Hormone dose group with flushing sequence on superovulatory response and embryo recovery in Dangi cows

Source of Variation	Degree of freedom	Mean Squares				
		Corpus luteum	Follicle	Viable embryos	Non transferable embryos	Total embryos
Hormone dose group	2	16.78	0.50	21.47	22.65	76.48**
Flushing sequence group	3	12.02	1.66*	10.23	15.28	46.84*
Error	37	6.66	0.53	6.09	14.05	16.43

The results indicated that the total yield of embryo significantly differed with the dose of the hormone while the difference in the number of viable embryos did not differ significantly when the dose was altered.

Mishra *et al.* (1996) while super ovulating 6 Sahiwal donors with two dose level of 24 mg and 28 mg of FSH-p treatment on day 9 to 12 days twice a daily schedule in descending doses observed that the mean super ovulatory response and transferable embryo recovery was 9.16±4.41 and 5.33 ±4.19 for 28mg dose and for 24 mg dose it was 4.83±2.79 and 2.00±1.63, respectively. Better response with higher FSH dose in Sahiwal than in Dangi indicated necessity of further research to identify breed and in relation to feeding and management differences. Further research trial involving larger number of animals in the present project could not be undertaken for want of time and resources. It was felt that the studies could be useful to decide the dose for field application.

It was concluded that more studies on effect of variable dose of FSH hormone required for synchronization for increasing super ovulatory response and viable embryos recovery in Dangi breed cattle are required to confirm the findings of the present investigation. Study of other factors affecting embryo production variables in Dangi cows can help reducing dose of hormone and subsequent cost of operation of the technology.

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