



ESTRUS SYNCHRONIZATION IN CROSSBRED DAIRY COWS UNDER FIELD CONDITIONS

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Abstract

A study was conducted to assess the effect of estrus synchronization technique on fertility and estrus induction response in crossbred cows under field conditions. Totally 30 infertile cows (anoestrous 13 and repeat breeder 17) were selected and divided randomly into two groups having 15 cows each. Estrus synchronization protocol (Triu-B) was adopted in Group I and Group II cows were kept as control. All the cows (100%) under Triu-B protocol were exhibited estrus between 48 and 72 hours following PG injection on day 7. Artificial insemination was carried out up to 3 subsequent estrus cycles in cows which were exhibited spontaneous or induced estrus. Number of inseminations, service period and pregnancy data were recorded and analysed statistically. In group I, mean number of service per conception was 1.42 whereas in group II was 2.43. The mean service period in days were differs significantly ($P \leq 0.01$) between treatment (129.42 ± 4.73) and control (158.71 ± 8.89) group. The higher conception rate (80 %) was obtained in treated group while in control group was 46.66 %. The results revealed that estrus synchronization protocol could be used effectively to augment reproductive performance in crossbred dairy cattle under field conditions.

Key words: Estrus synchronization, Dairy cattle, Infertility, Reproductive performance

I. INTRODUCTION

In India dairy farming plays vital role in the growth of rural economy. India occupies number one position globally and contributes 18.5 % of world milk production. India produces an annual output of 146.3 million tones during 2014-15 as compared to 137.69 million tonnes during 2013-14 recording a growth of 6.26 % [1]. Crossbred dairy cows have contributing significant role to attain this top position. The better reproductive performance of crossbred cows has positive correlation with higher productivity. So that, it is prime important to ascertain the reproductive problems in the field and that should treated with best technique to exploit the potential of crossbred animals.

In the field anoestrus and repeat breeding are major infertility problems in pleuriparous crossbred cows. To improve reproductive efficiency of crossbred dairy cows various strategies were employed [2]. Different estrus synchronization techniques and fixed time artificial insemination has been proposed to treat infertility problems of crossbred dairy cows. In this view, present study was conducted on effectiveness of recent estrus synchronization technique (Triu-B protocol) on reproductive performance of crossbred dairy cows under the field conditions.

II. MATERIALS AND METHODS

A. Selection of Animals

This study was carried out in devakottai and kaliyarkovil blocks of sivagangai district, Tamil Nadu. Preliminary information on breed, age of animal, estrus pattern, age at first calving, date of

last insemination, number of insemination per conception, date of last calving, number of calving, feeding practices, milk yield of dairy cows were collected. Cows were examined individually to assess the reproductive status. On the basis of preliminary data, 30 infertile animals (anoestrus 13 and repeat breeder 17) with no anatomical abnormality were selected. Before synchronization all cows were dewormed with broad spectrum anthelmintic to rule out possible parasitic infestations. To maintain positive energy balance cows were supplemented with mineral mixture (40 g / day / animal) during the treatment period.

B. Experimental Design

The cows were divided randomly into two groups having 15 cows each (consist of both anoestrus and repeat breeder). In group I cows were treated with estrus synchronization protocol using Triu-B (Progesterone releasing intravaginal device) method. The intravaginal device (Triu-B) was introduced on 0 day along with GnRH @ 10 µg injected intramuscularly. On 7th day Triu-B was removed and injected with PG @ 25 mg. On 9th day injected with GnRH @ 10 µg and Artificial Insemination (AI) was done on 10th day. Group II cows were maintained without any hormonal treatment. AI was carried out up to 3 subsequent estrus cycles on cows which were exhibited spontaneous or induced estrus. Cows were examined for pregnancy by rectal palpation, 60 days post insemination and conception rate was calculated as percentage of cows conceived after AI in a group. Data were recorded before and after the treatment and they were analysed with standard statistical analysis method [3].

III. RESULTS AND DISCUSSION

The response of estrus induction in cows treated with Triu-B protocol, mean number of services per conception, mean service period in days and conception rate were revealed in Table 1, 2 and Figure 1.

A. Estrus Induction Response

In group I, all the treated cows (100 %) were responded with treatment and exhibited estrus between 48 hours and 72 hours following PG injection on day 7, while in control group only nine cows (60 %) were found in estrus (Table 1). The results were in agreement with earlier findings revealed in crossbred cows under Triu-B protocol [4], [5] however higher than the findings of Mungad *et al.* [6] studied in anoestrus buffalos (83.33%).

B. Number of service per conception and Service period

It was observed that mean number of service per conception were differ significantly ($P \leq 0.01$) between treatment (1.42 ± 0.19) and control group (2.43 ± 0.29). The mean service period in days were also differ significantly ($P \leq 0.01$) in treated group (129.42 ± 4.73) and control group (158.71 ± 8.89).

Table 1: Response of estrus synchronization protocol (Triu-B) on reproductive performance of dairy cows

Protocols / Groups (n=15)	Estrus Induction Response (%)	Number of services per conception	Service Period (days)	Conception Rate (%)			
				1 st cycle	2 nd cycle	3 rd cycle	Over all 3 cycles
Group I (Triu-B)	100 % (15/15)	1.42 ± 0.19^a	129.42 ± 4.73^a	53.33 % (08/15)	42.86 % (03/07)	25 % (01/04)	80.00 % (12/15)
Group II (Control)	60 % (9/15)	2.43 ± 0.29^b	158.71 ± 8.89^b	11.11 % (01/09)	25.00 % (02/08)	66.66 % (04/06)	46.66 % (7/15)

Means bearing different superscripts within a column differ significantly ($P \leq 0.01$)

C. Conception rate

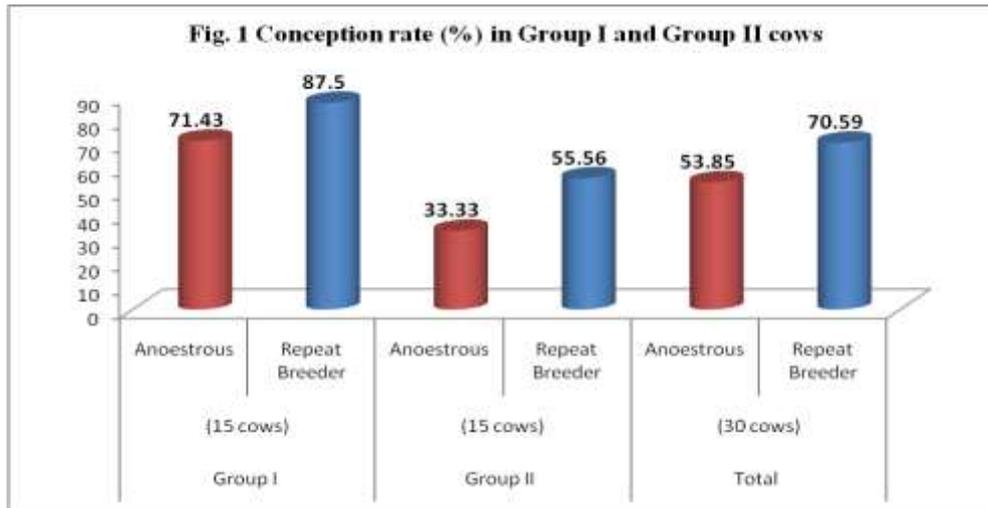


Figure 1: Conception rate (%) in group I (treatment) and group II (control)

Group I cows treated with estrus synchronization protocol (Triu-B) were conceived with conception rate of 53.33 %, 42.86 %, and 25 % in the first, second and third estrus cycle, respectively. Group II untreated cows were conceived with conception rate of 11.11 %, 25 % and 66.66 % in the first, second and third estrus cycle, respectively. The cows subjected to estrus synchronization (Triu-B) protocol, out of 07 anoestrus cows 05 cows were conceived with conception rate of 71.43 % and among the repeat breeders 07 cows were conceived with conception rate was 87.50 % (Fig.1). The overall conception rate obtained in treated group was 80.00 %. Whereas in untreated control group, 33.33 % of anoestrus cows (n=2) and 55.56 % of repeat breeder cows (n=5) were conceived. The overall conception rate obtained in control group was 46.66 %.

Table 2: Distribution of conceived cows in group I (treatment) and Group II (control)

Attributes	Group I (15 cows)		Group II (15 cows)		Total (30 cows)	
	Anoestrous	Repeat Breeder	Anoestrous	Repeat Breeder	Anoestrous	Repeat Breeder
Type of disorder	7	8	6	9	13	17
Conceived cows	5	7	2	5	07	12
Total conceived cows	12		07		19	
% of Conception	80.00 %		46.66 %		63.33 %	

Present study results were harmony with Thangadurai *et al.* [5] reported 83.33 % conception rate in anestrus cows and 100 % repeat breeder cows were conceived under Triu-B protocol. But lower conception rate (41.66 %) was reported by Buhecha *et al.* [4] in true anestrus crossbred cows treated with Triu-B protocol. Ammu Ramakrishnan *et al.* [7] revealed that, CIDR and Cosynch treatments showed good estrus expression and fertility in anestrus gir cows and reduce the maintenance cost of dry cows which is economically vital. Bhoraniya *et al.* [8] revealed ovsynch, CIDR, and ovsynch with CIDR protocols effectively used for estrus synchronization and enhance the fertility rate in anestrus kankrej cows. Besides, Dhami *et al.* [9] reported 80% conception rate in anestrus dairy cows through estrous synchronization technique.

Hormonal imbalance and its combination with other factors lead to the major cause of infertility in repeat breeding dairy cows [10]. Repeat breeders were treated with ovsynch based GnRH treatments produce higher percentage of conception rate than single hormonal treatment [11].

IV. CONCLUSION

Timely insemination, improved conception rate and less inter-calving period are most vital benefits of estrus synchronization technique. Based on the results, estrus synchronization protocol (Triu-B) could be used successfully to augment fertility and reproductive performance of crossbred dairy cattle under field conditions.

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