A COMPARETIVE OESTRUS AND FERTILITY STUDY ON EVALUATION OF THREE SYNCHRONIZATION PROTOCOLS[#]

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ABSTRACT

Post-partum cyclic Rathi and its crossbred cows were subjected to oestrus synchronization using either Ovsynch (OVS) (n=12), double progtaglandin injections (PG) 11 days apart (n=12) or CIDR-PG-E2 (CPE) protocols (n=12). Oestrus was detected by twice visual observations and cows were inseminated at standing oestrus using frozen semen. The proportions of cows responding were 100%, respectively for three protocols. OVS, PG and CPE groups oestrus duration was 27.75±1.19 hours, 90±4.31 hours and 37 ± 2.74 hours, respectively. The proportion of cows conceiving was 75, 66.67 and 75% for the OVS, PG and CPE groups, respectively. It was concluded that the OVS protocol is better for oestrus synchronization of Rathi and its crossbred cows.

***Key words*:** Cycling cows, ovsynch, CIDR, prostaglandin, synchronization, conception rate

Introduction

Synchronization of oestrus implies the manipulation of oestrus cycle or induction of oestrus to bring a large percentage of a group of females into oestrus at a short, predetermined time (Odde, 1990). However, the labour saving aspect is compared to the economic returns available when oestrus synchronization is used as a "reproductive management tool" (DeJarnette, 2001). Numbers of oestrus synchronization programmers are available in cattle based on the use of various hormones like progesterone, prostaglandin $F_{2\alpha}$ and their various combinations with other hormones like oestrogen and gonadotrophin releasing hormones (Islam, 2011). Synchronization protocols that regulate follicular development with a GnRH injection 7 days prior to a luteolytic dose of PGF2α not only improve oestrus detection rates and synchrony of oestrus, but also induce fertile oestrus cycles in both cyclic and anoestrus bovine females (Thompson *et al*., 1999; Stevenson *et al*., 2000). In this study, Rathi cows of dairy farm were taken to study the oestrus and fertility response in a least time period.

Materials and Methods

Bos indicus or their crosses cows were taken from the private dairy herds of Bikaner region. General health point of view only normal and cycling cows were taken. A total of 12 cyclic cows (n=12) were taken in the each group of protocols of oestrus synchronization. Hormones/hormonal device were used EAZI breed CIDR insert contains 1.38 g of progesterone, inj. Receptal contains 0.0042 mg buserelin acetate per ml, inj. Pragma contains 250 µg cloprostinol per ml, inj Progynon depot contains 10 mg estradiol valerate per ml.

Protocols of Oestrussynchronization

A. GnRH - $PGF_{2\alpha}$ -GnRH (Ovsynch/OVS)

All the 12 selected cyclic cows were taken as a group and were given an inj. Buserelin acetate 20 µg i/m. The day of first inj. was considered d 1. On day 5th inj. cloprostinol 0.5 mg i/m was given and again on day 7th second inj. Buserelin acetate 20 µg i/m was given again. After this all the treated cows were observed daily morning-evening for 7 days for the occurrence of signs of oestrus. The time of start of signs of oestrus and duration of oestrus were recorded. A day after the end of protocol is on 8th day both the ovaries of all cows were scanned to note the number of follicles developing and to record the size of the dominant follicle. All the cows which showed signs of oestrus were inseminated artificially 12 to 18 hours.

B. Two shots prostagladin ($PGF_{2\alpha}$) based (PG protocol)

One shot of inj. Cloprostinol 0.5 mg i/m was given and was considered as d 1 and then again were given second shot of same dose on d 11. The time of start of signs of oestrus and the total duration of oestrus were recorded for all the cows showed signs of oestrus and were inseminated 12 to 18 hours after the onset of oestrus.

C. Progesterone 'CIDR'-prostaglandin-oestrogen based (CPE)

CIDR was inserted in all the 12 cows. The day of insertion was considered as d1 of the start of protocol. Simultaneously, all the cows were given an inj. of estradiol velerate 2 mg i/m. CIDR was withdrawn on day 8 from insertion and inj. Cloprostinol 0.5 mg i/m was given. On day 9, all the cows were given an inj. of estadiolvelerate 1mg i/m. After the end of this protocol all the treated cows were observed daily morning-evening for 7 days for the occurrence of signs of oestrus. All the cows showed signs of oestrus were inseminated artificially 12 to 18 hours after the onset of oestrus.

Pregnancy diagnosis

All the covered but non returned cows were scanned ultasonographicaly or examined manually through rectum for

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Table 1: Parameters of induced oestrus

S. No.	Protocol	Onset of oestrus after the end of protocol(h)	Oestrus duration (h)	No. of cows covered	No. of cows conceived	No. of cow not covered
1	OVS	27.75±1.19 (18↓ 34↑)	18±0.75 (14↓ 24↑)	12	9 (75%)	Nil
2	PG	90±4.30 (72↓ 120↑)	18.92±0.92 (15↓ 24↑)	12	8 (66.66%)	Nil
3	CPE	37±2.74 (24↓ 48↑)	24.08±1.13 (18↓ 30↑)	10	7 (70%)	2(16.66%) (Due to purulent discharge)

(Values with increased or decreased (shown in table by arrows) marks and are the minimum and maximum values within the protocols, respectively

the confirmation of pregnancy at 35 to 60 days of pregnancy.

Results and Discussion

Oestrus synchronization is good management tool for programmed breeding, hence leading to the programmed feeding and easier management of the cows being at the same stage of gestation and finally calving spread over a shortest possible period (Satter, 2002).

In OVS protocol the onset of oestrus was also significantly ($P \leq 0.01$) earliest due to the effect of 2nd shot of GnRH, this protocol is considered most effective as in the shortest duration of within 16 hours (34-18=16 hours) all the cows showed onset of oestrus. Also the maximum CR (conception rate) 75% was recorded in this protocol. Geary and Whittier (1998) reported over all 57% CR in cows when used Ovsynch protocol of oestrus synchronization and Geary *et al.* (1998) reported that Ovsynch protocol is better in induction of oestrus and conception rate than syncromate B protocol. However, in both studies they worked on beef cattle where CR is considered quite lower than that of in dairy type of breeds.

The mean diameter of the dominant follicle in PG protocol recorded was 10.33±0.55 mm, which was significantly ($P \leq 0.01$) lower than the other two protocols. Another peculiarity of this protocol was that there was longest mean duration of onset of oestrus as 90±4.30 hours. This long duration is in accordance with the reportings of many other workers. (Dailey *et al*., 1983, Stephens and Rajamahendran, 1998; Kafi and Mousavi, 2000 and Rajamahendran *et al.*, 2001). In this protocol, like in others, all cows of the group came in oestrus (100% induction of oestrus) but the onset was variable than other protocols as have also been reported by other workers as mentioned. CR in this protocol recorded was 66.66 % (8/12). However, Satter (2002) recorded 46% CR in his work with such type of protocol and reported that this low CR was due to the hot and humid season in which the work was done. Likewise Kafi and Mousavi (2000) reported 69% oestrus induction rate and 41% CR in the same type of protocol.

In CPE protocol 100% cows showed synchronized induction of oestrus. Ayalon and Marcus (1975) have also recorded 100% onset of oestrus in cows when used progestin impregnated vaginal sponges for 14 days and also reported 60% CR. Expression of signs of oestrus in the cows of this protocol was quite usual. Like other two protocols, all the cows showed occurrence of oestrus (100%) but 2 cows were not given the artificial insemination service because of mucopurulent discharge at the time of oestrus. This may be due to carrying mild degree of infection either carried previously or also suggestive of contamination in the application of CIDR leading to the condition. Though, the number of cows in the protocols was small but 70% CR was achieved which was higher than the PG protocol. Kafi and Mousavi (2000) reported 82% onset of oestrus and 63% CR in cows when applied CPE type of protocol for synchronization of oestrus.

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