

USE OF CIDR PLUS PGF_{2α} IN CROSSBRED COWS HAVING MATURED CL FOR ENHANCED CONCEPTION RATE

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ABSTRACT

Thirty healthy, parous, cyclic crossbred cows aged under 8 years were selected and randomly divided into two groups as group I (n=10) and group II (n=20). Group I served as control and group II cows were synchronized with CIDR + PGF_{2α} protocol in the presence of matured CL. Breeding was carried during the observed estrus in group I and at 48 and 72 h after removal of CIDR in group II cows with good quality frozen thawed Jersey crossbred semen. The group II cows showed 100 per cent estrus induction with a mean time of onset of induced estrus of 46.20 ± 0.50 h in group II cows. The duration of estrus was 25.40 ± 0.45 and 26.30 ± 0.47 h in group I and group II, respectively. The incidence of intense and intermediate estrus was significantly higher in group II when compared with group I cows. The length of estrus in non conceived cows was 22.13 ± 0.52 and 21.37 ± 0.62 days in group I and II, respectively with a conception rate of 20 and 60 per cent in group I and II. It was concluded that application of CIDR and PGF_{2α} with FTAI was effective in improving conception rate in cross bred cows.

Keywords: CIDR, Conception rate, Crossbred cows, Induced estrus, PGF_{2α}

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Proper detection of estrus and timing of insemination play a vital role to improve reproductive efficiency. The lack of an efficient and accurate method of estrus detection limits the reproductive performance

of dairy cattle. The CIDR based protocol is considered as an effective tool to overcome these difficulties by synchronizing follicular wave emergence, follicular development and ovulation as it allows for 100 per cent of the cows to be submitted to artificial insemination, without the need for estrus detection (Kim *et al.*, 2005). Intravaginal progesterone releasing devices synchronise oestrus up to 85 per cent between 36 and 60 h after the end of treatment (Diskin *et al.*, 2001). Hence the present study was formulated with a view to study the pattern

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of estrus and fertility with the application of CIDR + PGF_{2α} in the presence of matured CL.

Thirty healthy, cyclic, parous well maintained crossbred cows below the age of 8 years with good Body Condition Score (BCS) were selected from an organized farm based on the breeding history and no visible or palpable abnormalities in the genital tract, under uniform managerial conditions. The selected cows were randomly divided into two groups as group I (n=10) and group II (n=20). Group I acted as control. Group II cows were synchronized using CIDR plus PGF_{2α} in the presence of matured CL and FTAI protocol. Group I cows were bred during observed estrus and group II cows were inseminated at 48 and 72 h after CIDR removal. The onset of induced estrus, duration and intensity of estrus, conception rate and length of estrous cycle in non conceived cows were studied. The data was statistically analyzed as per the method of Snedecor and Cochran (1967).

The crossbred cows treated with CIDR + PGF_{2α} showed 100 per cent estrus induction response which concurred with the observation of Dhama *et al.* (2015). The post treatment estrus induction was higher than the observations of Cavalieri *et al.* (2004) and Jyothi *et al.* (2012) who found that the estrus induction response was 91.67 to 97.30 per cent in crossbred cows. The possible reason for getting higher estrus induction response in the present study might be due to the time of application of CIDR and luteolytic effect of PGF_{2α} on the mature corpus luteum, as the stage of cycle advances (Krishnakumar and Chandrahasan, 2012).

The mean time taken for the onset of induced estrus was 46.20 ± 0.50 h in group II cows and is in agreement with the observations of Cavalieri *et al.* (2004) and Jyothi *et al.* (2012) who recorded the onset of induced estrus between 44.2 ± 2.8 h and 48.50 ± 1.10 h in crossbred cows. The shorter induction time of estrus observed in this study might be due to the application of short term progesterone treatment for 9 days in the presence of matured CL and administration of PGF_{2α} 24 h prior to CIDR implant removal, results in close synchrony between estrus and ovulation.

The mean duration of estrus in group I and II cows were 25.40 ± 0.45 h and 26.30 ± 0.47 h, respectively and there was no significant difference between groups (Table). Similar to the present study Jyothi *et al.* (2012) reported mean duration of estrus of 25.50 ± 0.70 h in crossbred cows. The use of progesterone device might have increased the ability of the hypothalamus-pituitary gonadal axis to generate estrus and LH surge in response to an increase in endogenous estradiol response to ovulation and shorten the duration of estrus (Todoroki and Kaneko, 2006).

The percentage of intensity of estrus in group I and II are presented in Table 1 and its difference between groups was highly significant ($P < 0.01$) wherein the percentage of weak estrus was significantly higher and intense estrus was significantly lower in control cows than the treated cows. Similar intensity of estrus having a longer duration was reported by Duchens *et al.* (1995)

The mean length of estrous cycle for non conceived cows of group I and II was 22.13

Table 1. Duration, intensity of estrus, length of estrous cycle and conception rate with CIDR+PGF_{2α} treatment in crossbred cows

Group	Treatment	Duration of estrus (h)	Intensity of estrus			Number of non conceived cows	Length of estrous cycle (days)	Conception rate (Conceived)
			Intense	Intermediate	Weak			
I (n=10)	Control	25.40 ^a ± 0.45	2 ^a (20)	3 ^a (30)	5 ^a (50)	8 (80)	22.13 ^a ± 0.52	2 ^a (20)
II (n=20)	CIDR+PGF _{2α}	26.30 ^a ± 0.47	12 ^b (60)	6 ^b (30)	2 ^a (10)	8 (40)	21.37 ^a ± 0.62	12 ^b (60)

Means bearing different superscripts in each column differ significantly (P<0.01)

Figures in parenthesis indicate percentage

± 0.52 and 21.37 ± 0.62 days, respectively without significant difference (Table 1). The result obtained in the present study was harmonized with the observations of Sartori and Barros (2011) who reported normal estrous cycle length ranged from 18-24 days in cows. While Taponen *et al.* (2000) did not find any influence on subsequent estrous cycle length in non conceived cows. The application of CIDR with PGF_{2α} favours synchronous development of follicular wave, ovulation and CL development resulting in normal cycle length in subsequent estrous cycles.

The conception rate for group I and II cows were 20 and 60 per cent (Table 1). These findings are in accordance with Macmillan and Peterson (1993) who reported 57.7 per cent conception in cows after synchronization with PRID and PG, but lower conception rate (40 to 45 per cent) was observed by Jyothi *et al.* (2012) with 40 to 45 per cent in CIDR + PGF_{2α} treated crossbred cows. The higher conception rate in the present study confirmed that priming of hypothalamic system with adequate plasma progesterone during pre conception period is responsible for optimal growth of ovulatory

follicle and CL development as well as for the priming of endometrium.

It can be inferred that the application of CIDR in the presence of matured CL and PGF_{2α} on day 8 post CIDR insert with FTAI at 48 and 72 h CIDR withdrawal was found to be effective in achieving better estrus pattern thereby improved conception rate in crossbred cows.

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