

## CHAPTER IV

### 4.0 RESULTS

#### 4.1 Fertility responses of synchronized cows

The results for the fertility responses of synchronized cows were described in the following sections.

##### 4.1.1 Effect of farming systems on body condition score (BCS) and fertility responses of synchronized cows

Body condition score (BCS) of cows in the intensive farm ( $4.59 \pm 0.22$ ) was significantly higher ( $p < 0.05$ ) than that of cows in the semi intensive ( $3.76 \pm 0.14$ ) and integrated ( $3.42 \pm 0.12$ ) farms. No significant difference was obtained between integrated farm and semi-intensive farms. A total of 67.3% cows showed estrus after the synchronization with 68% in intensive, 76% in semi-intensive and 58% in integrated farms. No significant differences were observed in the number of cows that showed estrus in the three farming systems. Cows in intensive (59%) and semi-intensive farms (59%) showed significantly higher percentage of pregnancy to fixed time insemination than that of the integrated (37%) farm (Table 4.1).

**Table 4.1 Effect of farming system on body condition score (BCS), estrus and percentage of pregnancy of synchronized cows**

<b>Farming System</b>	<b>BCS Mean<math>\pm</math>SEM</b>	<b>Estrus (%) Mean<math>\pm</math>SEM</b>	<b>Pregnancy (%) Mean<math>\pm</math>SEM</b>
Integration (n=19)	$3.42 \pm 0.12^a$	$58.00 \pm 11.60^a$	$37.00 \pm 11.40^a$
Semi-intensive (n=42)	$3.76 \pm 0.14^a$	$76.00 \pm 6.70^a$	$59.00 \pm 10.70^b$
Intensive (n=41)	$4.59 \pm 0.22^b$	$68.00 \pm 4.60^a$	$59.00 \pm 7.80^b$

Means with different superscripts <sup>a,b</sup> in the same column are significantly different ( $p < 0.05$ )

#### 4.1.2 Effect of breeds on body condition score (BCS) and fertility responses of synchronized cows

Charolais crossbreds breed had better BCS ( $4.65 \pm 0.18$ ) than Brahman crossbreds ( $4.03 \pm 0.11$ ) and Kedah-Kelantan breeds ( $3.43 \pm 0.09$ ). A total of 70% cows showed estrus during the treatment whereby the percentages were 63% in Charolais crossbreds, 73% in Kedah-Kelantan and 85% in Brahman crossbreds. No significant difference was observed in the numbers of cows that showed estrus between the breeds.

Charolais crossbreds showed significantly higher percentage of pregnancy (58%) to fixed time insemination when compared to Brahman crossbreds (54%) and Kedah-Kelantan (49%) ( $p < 0.05$ ) (Table 4.2).

**Table 4.2 Effect of breeds on body condition score (BCS), estrus and percentage of pregnancy of synchronized cows**

<b>Breeds</b>	<b>BCS</b> Mean $\pm$ SEM	<b>Estrus (%)</b> Mean $\pm$ SEM	<b>Pregnancy (%)</b> Mean $\pm$ SEM
Charolais crossbreds (n=52)	$4.65 \pm 0.18^b$	$63.00 \pm 6.70^a$	$58.00 \pm 6.90^a$
Brahman crossbreds (n=13)	$4.03 \pm 0.11^b$	$85.00 \pm 10.40^a$	$54.00 \pm 5.00^a$
Kedah-Kelantan (n=37)	$3.43 \pm 0.09^a$	$73.00 \pm 7.40^a$	$49.00 \pm 8.30^a$

Means with different superscripts <sup>a,b</sup> in the same column are significantly different ( $p < 0.05$ )

#### 4.1.3 Effect of body condition score (BCS) on fertility responses of synchronized cows

There was no significant difference in the response of estrus to BCS. However, the percentage of pregnancy for cows with BCS 3, 4 and (5,6,7) were 43%, 53% and 69%, respectively. Cows with BCS (5,6,7) had higher percentage of pregnancy when compared to cows with BCS 3 and 4 (Table 4.3).

**Table 4.3 Effect of body condition score (BCS) on estrus and percentage of pregnancy of synchronized cows**

<b>Body Condition Score (BCS)</b>	<b>Estrus (%) Mean±SEM</b>	<b>Pregnancy (%) Mean±SEM</b>
3 (n=44)	70.00 ± 7.00 <sup>a</sup>	43.00 ± 7.60 <sup>a</sup>
4 (n=32)	72.00 ± 8.10 <sup>a</sup>	53.00 ± 9.00 <sup>ab</sup>
5,6,7 (n=26)	65.00 ± 9.50 <sup>a</sup>	69.00 ± 9.20 <sup>b</sup>

Means with different superscripts <sup>a,b</sup> in the same column are significantly different (p < 0.05)

#### **4.1.4 Effect of days of postpartum interval on fertility responses of synchronized cows**

The days of postpartum interval was divided into two categories (<55 days, n=34) and (≥ 55 days, n=68). After synchronization, cows with ≥ 55 days of postpartum interval had significantly higher onset of estrus (75%) and percentage of pregnancy (62%) than cows with < 55 days of postpartum in estrus (59%) and percentage of pregnancy (35%) (Table 4.4).

**Table 4.4 The effect of days of postpartum interval on estrus and percentage of pregnancy of synchronized cows**

<b>Days of postpartum interval</b>	<b>Estrus (%) Mean±SEM</b>	<b>Pregnancy (%) Mean±SEM</b>
< 55 (n=34)	59.00 ± 8.60 <sup>a</sup> (n=20)	35.00 ± 8.30 <sup>a</sup> (n=12)
≥55 (n=68)	75.00 ± 5.30 <sup>b</sup> (n=51)	62.00 ± 5.90 <sup>b</sup> (n=42)

Means with different superscripts <sup>a,b</sup> in the same column are significantly different (p < 0.05)

## **4.2 Progesterone and estradiol profiles of synchronized cows**

### **4.2.1 Progesterone profiles of synchronized cows**

Controlled internal drug released (CIDR) implant was inserted on day 0 after blood collection which caused progesterone level to increase immediately after implantation and decreased when CIDR was removed (n=28) (Figure 4.1). Progesterone level on day 0 was  $3.16\pm 0.74$  ng/ml for all breeds. Progesterone level reached the peaks on day 3 ( $12.75\pm 2.80$  ng/ml). After CIDR removal on day 7, the level of progesterone started to decline and the lowest level was observed on day 12 ( $1.37\pm 0.48$  ng/ml) (Table 4.5).

Progesterone levels on day 0 were  $7.47\pm 1.13$  ng/ml,  $0.52\pm 0.09$  ng/ml, and  $3.13\pm 0.92$  ng/ml, for Charolais crossbreds, Brahman crossbreds and Kedah-Kelantan, respectively (Figure 4.2). Progesterone level was highest for Charolais crossbreds ( $6.21\pm 1.25$  ng/ml), Brahman crossbreds ( $9.03\pm 3.73$  ng/ml) and Kedah-Kelantan ( $27.16\pm 5.36$  ng/ml) on day 3. After CIDR removal on day 7, the level of progesterone started to decline and the lowest level was  $2.12\pm 1.15$  ng/ml,  $0.53\pm 0.18$  ng/ml, and  $0.47\pm 0.05$  ng/ml, for Charolais crossbreds, Brahman crossbreds and Kedah-Kelantan, respectively. The progesterone levels were maintained after CIDR removal for all the breeds (Table 4.6).

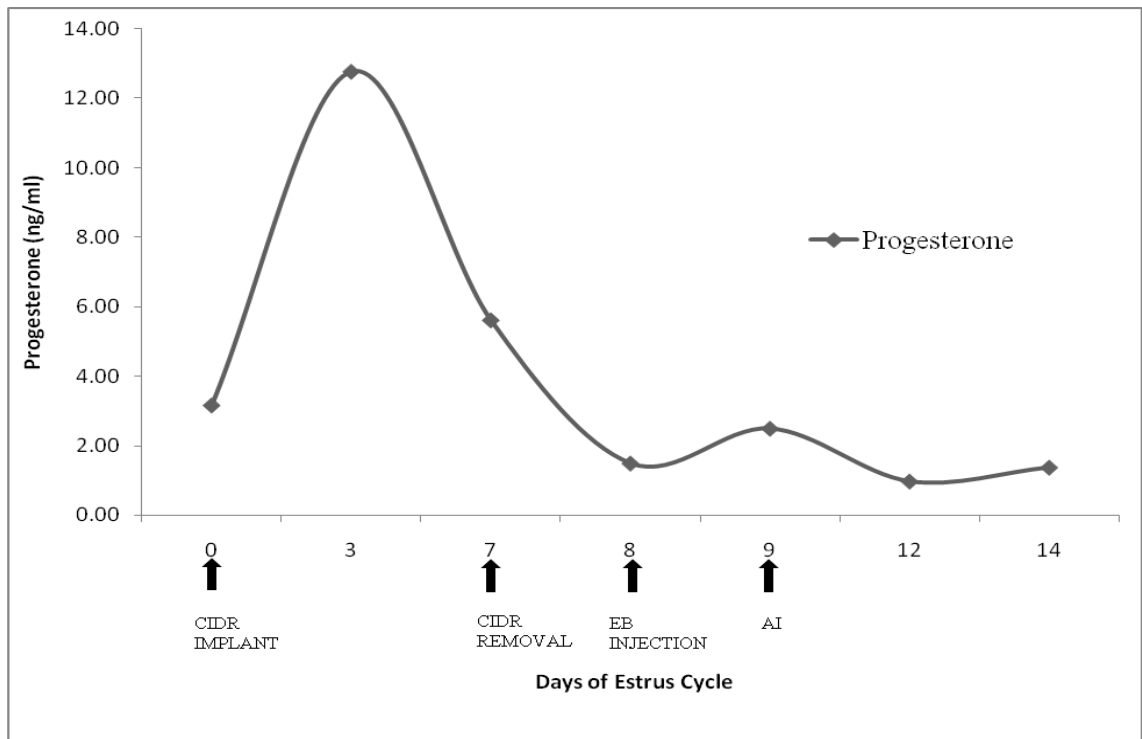
**Table 4.5 Progesterone (ng/ml) levels of synchronized cows**

Breed	Progesterone Level (ng/ml) (Mean±SEM)						
	Day 0	Day 3	Day 7	Day 8	Day 9	Day 12	Day 14
All breed cows (n=28)	3.16 ± 0.74	12.75 ± 1.25	5.61 ± 0.71	1.48 ± 0.51	2.49 ± 0.76	1.37 ± 0.48	3.98 ± 0.52

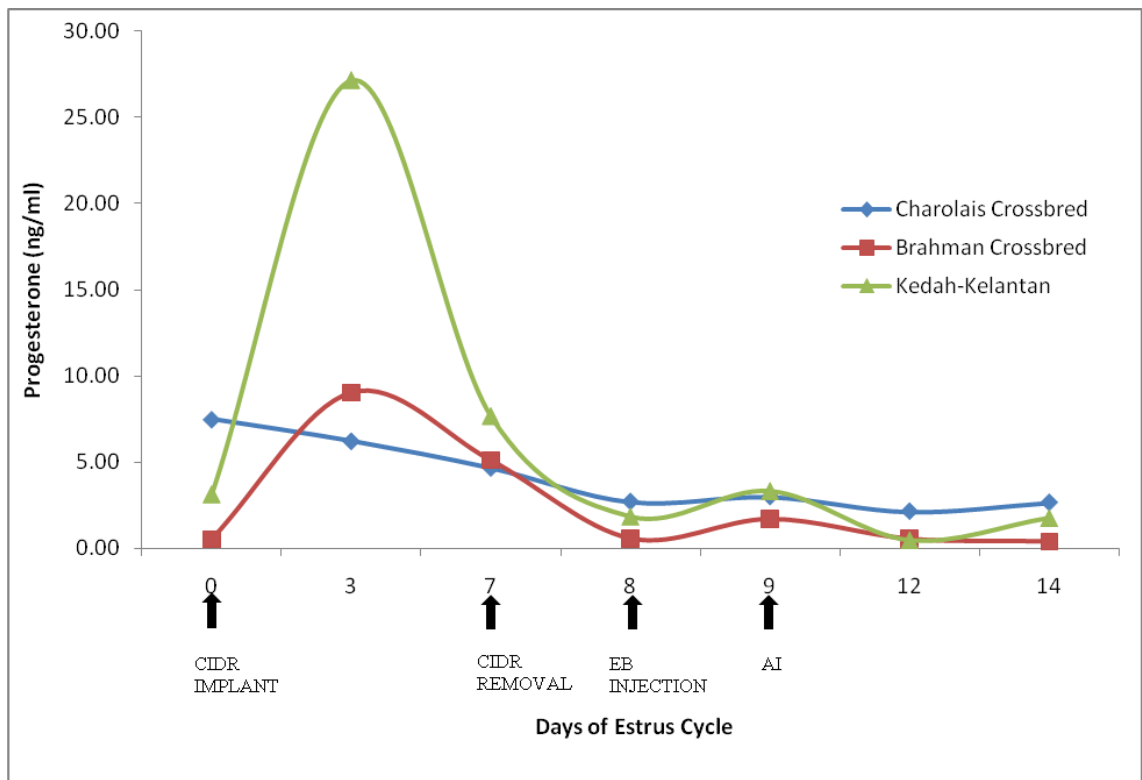
**Table 4.6 Progesterone (ng/ml) levels in different breeds of synchronized cows**

Breed	Progesterone Level (ng/ml) (Mean±SEM)						
	Day 0	Day 3	Day 7	Day 8	Day 9	Day 12	Day 14
Charolais crossbreds (n=8)	7.47 ± 1.13 <sup>a</sup>	6.21 ± 1.25 <sup>a</sup>	4.65 ± 1.09 <sup>a</sup>	2.69 ± 1.27 <sup>a</sup>	2.98 ± 1.85 <sup>a</sup>	2.12 ± 1.15 <sup>a</sup>	2.64 ± 1.21 <sup>a</sup>
Brahman crossbreds (n=13)	0.52 ± 0.09 <sup>b</sup>	9.03 ± 3.73 <sup>a</sup>	5.09 ± 1.49 <sup>a</sup>	0.55 ± 0.15 <sup>a</sup>	1.68 ± 0.75 <sup>a</sup>	0.53 ± 0.18 <sup>a</sup>	0.38 ± 0.03 <sup>a</sup>
KK (n=7)	3.13 ± 0.92 <sup>c</sup>	27.16 ± 5.36 <sup>b</sup>	7.67 ± 1.14 <sup>a</sup>	1.84 ± 0.74 <sup>a</sup>	3.32 ± 1.19 <sup>a</sup>	0.47 ± 0.05 <sup>a</sup>	1.76 ± 0.67 <sup>a</sup>

Means with different superscripts <sup>a,b,c</sup> in the same column are significantly different (p < 0.05)



**Figure 4.1 Progesterone profile in the peripheral plasma of synchronized cows (n=28)**



**Figure 4.2 Progesterone profiles in the peripheral plasma of synchronized Charolais crossbreds, Brahman crossbreds, and Kedah-Kelantan cows**

#### 4.2.2 Estradiol profile of synchronized cows

Estradiol level was  $3.27 \pm 0.55$  pg/ml on day 0 for all breeds (Figure 4.3), on day 8, that was after CIDR removal and estradiol benzoate injection the level of estradiol started to increase and achieved the peak on day 9 ( $43,47 \pm 7.88$  pg/ml) (Table 4.7).

On day 0, estradiol levels were 0.00 pg/ml,  $5.01 \pm 0.90$  pg/ml, and  $4.60 \pm 0.61$  pg/ml, for Charolais crossbreds, Brahman crossbreds and Kedah-Kelantan, respectively. The insertion of the CIDR implant caused a slight drop in estradiol level and later increased after estradiol benzoate injection on day 8 (Figure 4.4). Estradiol level were highest on day 9 for all breeds where Charolais crossbreds ( $77.26 \pm 1.89$  pg/ml), Brahman crossbreds ( $34.20 \pm 1.48$  pg/ml) and Kedah-Kelantan ( $27.47 \pm 4.91$  pg/ml) (Table 4.8).

**Table 4.7 Estradiol (ng/ml) levels of synchronized cows**

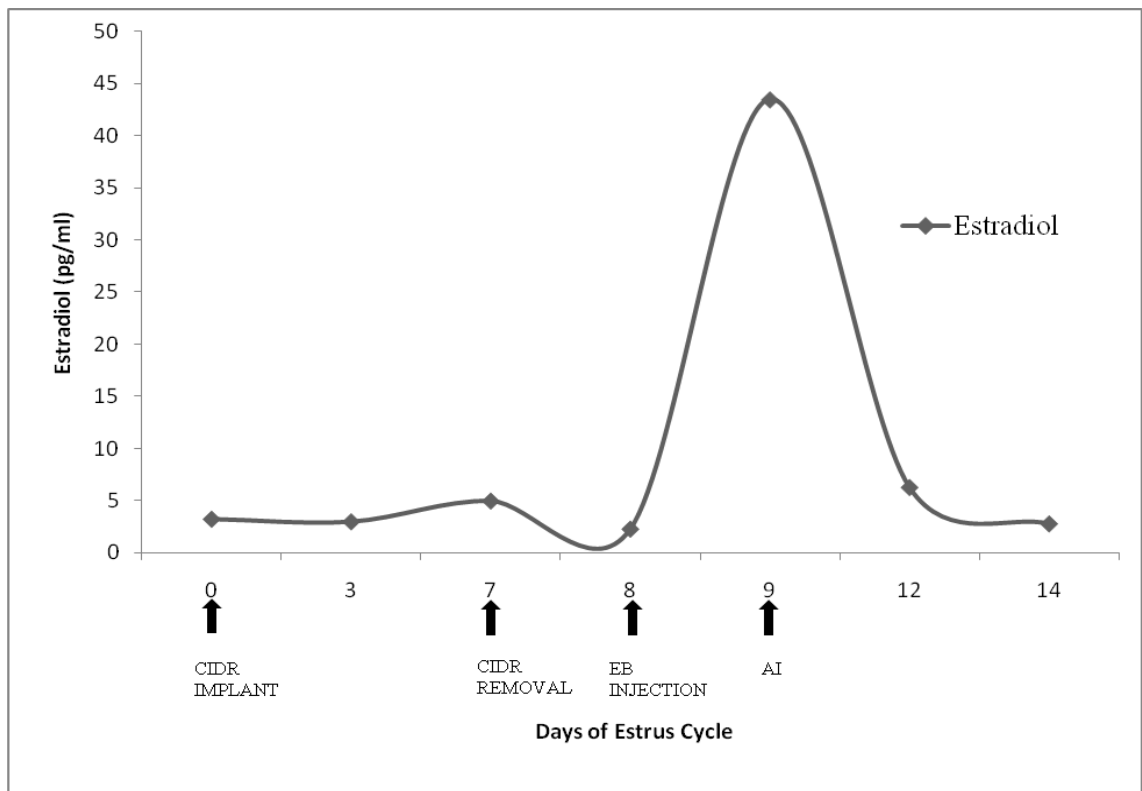
Breed	Estradiol Level (ng/ml) (Mean±SEM)						
	Day 0	Day 3	Day 7	Day 8	Day 9	Day 12	Day 14
All breed cows (n=28)	3.27 ± 0.55	3.05 ± 0.73	4.08 ± 1.14	2.32 ± 0.59	43.47 ± 7.88	6.31 ± 1.94	9.33 ± 1.54

**Table 4.8 Estradiol (pg/ml) levels in different breeds of synchronized cows**

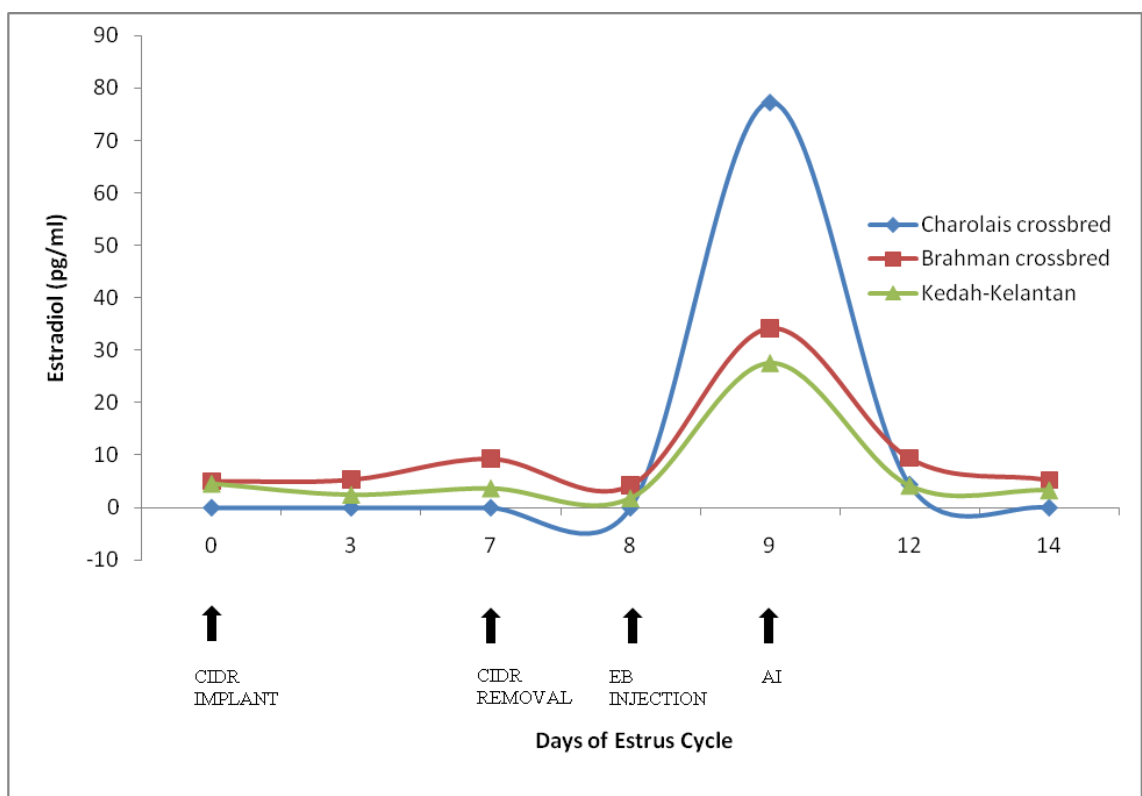
Breed	Estradiol Level (pg/ml) (Mean±SEM)						
	Day 0	Day 3	Day 7	Day 8	Day 9	Day 12	Day 14
Charolais crossbreds (n=8)	0.00 ± 0.00 <sup>a</sup>	0.00 ± 0.00 <sup>a</sup>	0.00 ± 0.00 <sup>a</sup>	0.00 ± 0.00 <sup>a</sup>	77.26 ± 1.89 <sup>b</sup>	4.42 ± 4.42 <sup>a</sup>	0.00 ± 0.00 <sup>a</sup>
Brahman crossbreds (n=13)	5.01 ± 0.90 <sup>b</sup>	5.32 ± 1.75 <sup>a</sup>	9.31 ± 6.87 <sup>b</sup>	4.19 ± 1.61 <sup>b</sup>	34.20 ± 1.48 <sup>a</sup>	9.41 ± 5.37 <sup>b</sup>	5.27 ± 1.16 <sup>b</sup>
KK (n=7)	4.60 ± 0.61 <sup>b</sup>	2.50 ± 0.50 <sup>a</sup>	3.71 ± 0.51 <sup>a</sup>	1.83 ± 0.41 <sup>a</sup>	27.47 ± 4.91 <sup>a</sup>	4.22 ± 0.70 <sup>a</sup>	3.36 ± 1.26 <sup>b</sup>

Means with different superscripts <sup>a,b</sup> in the same column are significantly different (p < 0.05)





**Figure 4.3** Estradiol profile in the peripheral plasma of synchronized cows (n=28)



**Figure 4.4** Estradiol profiles in the peripheral plasma of synchronized Charolais crossbreds, Brahman crossbreds, and Kedah-Kelantan cows