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**ESTRUS SYNCHRONIZATION WITH REDUCED
CLOPROSTENOL DOSES IN HEIFERS**
(With 2 Tables)

By

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(Received at 8/2/1992)

توافق الشبق بإستخدام جرعات مخفضة من
البروستاجلاندين في الفريان

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تم هذا البحث علي ٢٢ كزّبة براون سويس ، وحقت جميع الحيوانات بجرعة
من البروستاجلاندين قدرها ٥٠٠ ميكروجرام ثم قسمت الحيوانات إلي ثلاث مجموعات
وبعد ١١ يوم من هذا العلاج حقت حيوانات المجموعة الأولى بالعقار المستخدم بجرعة
قدرها ٥٠٠ ميكروجرام في العزل ، أما كزّبات المجموعة الثانية فقد حقت بجرعة
قدرها ٢٥٠ ميكروجرام في نفس ناحية الجسم الأيسر ، وأما حيوانات المجموعة
الثالثة فقد عزلت بجرعة قدرها ١٢٥ ميكروجرام في المهبل . وكانت نسبة التوافق
في المجموعة ١ ، ٢ ، ٣ هي ١٠٠ ، ٧٥ ، ١٤.٣٪ علي التوالي .

SUMMARY

This trial was carried out on 22 Brown Swiss heifers. All animals were injected with 500 mg of cloprostenol and then divided into three groups. Eleven days after first treatment, group 1 heifers received 500 mg of cloprostenol intramuscularly. Heifers in group 2 were injected with 250 mcg of cloprostenol intramuscularly ipsilateral to active corpus luteum and group 3 heifers were treated with 125 mcg of cloprostenol intravaginally. Synchronization rates in group 1, 2 and 3 were 100, 75 and 14.3% respectively after second cloprostenol administration.

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INTRODUCTION

The availability and the application methods of PG F_{2α} and its analogues in cyclic regulation of cattle have been reported by many workers in 1970 s. The intramuscular injection is the most convenient and probably the most practical route for estrus synchronization. However, prostaglandins are still expensive in many developing countries, which limits their usage in large scale. A lot of injection methods and deposition places, intrauterine, intravulvo-submucosal, intravaginal, intraovarian etc., have been suggested to reduce effective doses of prostaglandins (COYAN et al., 1990; RAYOS et al., 1990 and SUBRAMANIAM et al., 1989 and SUBRAMANIAM et al., 1991). Possibly the disadvantage of these methods is that they need special equipments and skilfull technician. The present study was undertaken to determine the methods which may reduce the effective doses of cloprostenol in heifers.

MATERIAL and METHODS

Twenty-two apparently healthy and normally cycling heifers belonging to the Konya Animal Livestock Research Institute were used in this trial. Two consecutive estrus cycles of these heifers were closely monitored and transrectal examinations were carried out to determine gross characteristics fo the reproductive tract, prior to the initiation of this experiment.

The heifers were divided into three groups. Group 1, 2 and 3, containing 7, 8 and 7 animals respectively. The first injection of 500 mcg cloprostenol was given regardless to the day of the estrus cycle. Eleven days after first injection, heifers were examined transrectally and active corpus luteum on left or right ovary was noted with a view to resort to ipsilateral intramuscular injection of cloprostenol.

On the day of second cloprostenol injection, heifers in group 1 received 500 mcg of cloprostenol per animal by intramuscular injection. Heifers in group 2 were injected with 250 mcg, half of the normal intramuscular dose, of cloprostenol intramuscularly. Intramuscular injections were given on the thigh, which is ipsilateral to active corpus luteum. Heifers in group 3 received 125 mcg of cloprostenol deposited in the vagina adjacent to the cervix. The drug was thrown into 0.25 ml of French straws and deposited by using an Al pistolette. Two of such straws were used for each heifer in this group. All heifers were observed twice daily for signs of behavioural estrus and corpus luteum diameter was monitored by daily palpation for three days after cloprostenol application.

ESTRUS SYNCHRONIZATION, CLOPROSTENOL, HEIFERS

RESULTS

The results indicated that 14 out of 22 heifers in three groups responded positively for synchronization of estrus. Two heifers from group 2 and six from group 3 didn't respond to the treatment. All heifers in group 1 showed estrus symptoms after treatment.

The response rate in each group of heifers is summarized in table 1.

Table 1: Effect of dose and administration route of cloprostenol on estrus response rate.

Group	Route	Number of heifers	
		Treated (n)	Responded (n)
1	500 mcg intramuscular	7	7 (100.0)
2	250 mcg intramuscular ipsilateral to the CL bearing ovary	8	6 (75.0)
3	125 mcg intravaginal	7	1 (14.3)

Corpus luteum diameter after treatments are presented in table 2.

Table 2: Corpus luteum diameter after treatments

Days after treatment	Cloprostenol administration route and CL diameter		
	Group 1: 500 mcg intramuscular (n: 7)	Group 2: 250 mcg intramuscular ipsilateral to CL bearing ovary (n: 8)	Group 3: 125 mcg intravaginal (n:7)
0 ^a	2.00 ± 0.08	1.70 ± 0.25	2.22 ± 0.11
1	1.62 ± 0.11	1.48 ± 0.19	1.95 ± 0.16
2	1.38 ± 0.14	1.22 ± 0.12	1.78 ± 0.14
3	TS ^b	TS	1.55 ± 0.10

a: Day of injection

b: Too small for precise estimation

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Corpus luteum diameter declined continuously during the period of 72 hours following cloprostenol application (Table 2). The luteal regression process in group 1 heifers wasn't faster than those detected in group 2.

DISCUSSION

Cows and heifers having active corpora lutea can respond with synchronized estrus when they are treated with a single injection of PG F_{2α}. The costs of treatment can be reduced several times by applying the lower doses in some special way. SUBRAMANIAN, et al. (1989) indicated that injection of PG F_{2α} intramuscularly in buffaloes at a dose level of 12.5 mg per animal ipsilateral to active corpus luteum or 5 mg/animal intravaginally could elicit synchronization of estrus. LOUIS, et al. (1973) also pointed out that PG F_{2α} has luteolytic effect during diestrus in heifers and intramuscular administration was more effective than intravaginal administration.

From the results obtained in group 2 heifers, it was concluded that 250 mcg cloprostenol (half of the systemic dose) was highly effective (75%) for luteolysis and estrus synchronization in heifers when injected intramuscularly ipsilateral to active corpus luteum. Synchronization rate was low (14.3%) in the heifers in groups 3. Possibly this was due to the insufficient or incomplete absorption of cloprostenol from the vaginal mucosa. Although a regular dropping in size of corpus luteum was detected, any visible estrus symptoms hasn't been observed except in one heifer. LEIDL, et al. (1977) also agreed that the responsiveness to the cloprostenol injections may occur along with the dropping in corpus luteum diameter.

Heifers in group 1 came into estrus at the rate of 100% after injection of 500 mcg cloprostenol. ALACAM, et al. (1989) also reported similar findings in heifers. The present study indicated that intramuscular injection of 250 mcg of cloprostenol per animal ipsilaterally to active corpus luteum caused luteal regression and elicited synchronization of estrus at the rate of 75% but application of 125 mcg cloprostenol intravaginally failed to induce estrus synchronization.

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