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PROSTAGLANDIN ESTRUS SYNCHRONIZATION FOR BRAHMAN
AND BRAHMAN INFLUENCED BREEDS OF CATTLE

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SUMMARY

Prostaglandins (Lutalyse® and Estrumate®) have been commercially available for estrus synchronization in cattle for several years and a new prostaglandin Alfaprostol is being developed. Producers have reported both success and failure of these products in practical use. From this research the following recommendations can be made:

1. Select animals for estrus synchronization with prostaglandins that have active ovaries (i.e., are having estrous cycles) if it is possible.
2. If possible, avoid the late fall and winter for estrus synchronization of Brahman and Brahman-influenced breeds of cattle.
3. Breed after estrus detection.
4. Breed after the first injection.
5. Give the second injection only to animals not bred, and continue breeding.

OBJECTIVE

The objective of this research was to determine an effective system for using the prostaglandins in Brahman and Brahman influenced breeds of cattle.

PROCEDURE

Experiment I

In this experiment, 6 herds of purebred, nonlactating Brahman cows and heifers were equally allotted by age, bull to be bred to, and stage of the estrous cycle to act as controls or to receive 2 injections of 25 mg Lutalyse® 11 days apart. Four herds of 32, 36, 38 and 49 animals were treated during the late spring and early summer and 2 herds of 36 and 31 animals were treated during the late fall. Sterile marker bulls were used for estrus detection and insemination occurred 12 hours after detection of estrus.

Experiment II

Two herds of Brahman and 3 herds of Brangus cows were randomly assigned within ovarian status (1 = no activity; 2 = follicular activity; 3 = corpus luteum) to receive either Alfaprostol (5 mg) or Lutalyse (25 mg). All animals were bred following estrus detection after the first injection. All animals not bred received a second injection of the appropriate prostaglandin. Sterile marker bulls were used for estrus detection in the Brahman herds and heat detector patches (K-Mar®) were used in the Brangus herds.

RESULTS

In Experiment I the first service conception rates were 52.7% in the controls and 50.2% in the Lutalyse® treated Brahman cows and heifers. In this study estrus synchronization with Lutalyse® did not change first service conception rates. Pregnancy rates during the first 5 days were higher ($P < .001$) in the Lutalyse® treated (29.6%) compared to the control (12.4%) Brahman females. Pregnancy rates during the first 25 days did not differ between control (40.3%) compared with Lutalyse® (45.4%) treated Brahman females. If the double injection on an 11 day interval was efficacious in synchronization of estrus the same number of cattle in the Lutalyse® treated group should have become pregnant during the first 5 days as controls during the first 25 days. Less ($P < .02$) Lutalyse® (29.6%) treated females became pregnant during the first 5 days than controls (40.3%) during the first 25 days. This indicated that we were not synchronizing estrus in a satisfactory manner to optimize pregnancy rates during the first 5 days.

During the first 25 days 66.4% of the controls were detected in estrus and inseminated compared with 46.0% of the Lutalyse® treated animals after the first injection and 46.4% after the second injection. No increase in numbers of cows and heifers was found between the first and second injections of Lutalyse®. When the data was analyzed, 22.5% of the animals responded only to the first injection and 20.7% responded only to the second injection of Lutalyse® and 34.2% responded to both injections (Table 1). If all animals responded as they should have we should have seen an increased

estrus response following the second injection of Lutalyse®. When comparing the total number of Lutalyse® treated animals which responded to one or both injections, 77.5% of the animals were capable of responding to treatment.

If Brahman females were bred at estrus after the first injection and only animals not bred were given the second injection, 41% more females could be inseminated compared with the number of females inseminated using the double injection system (Table 2).

The lower number of prostaglandin treated cows bred during the first 5 days compared with control cows bred in 25 days was not caused by a lack of response to Lutalyse®, but by a lack of response to the double injection over 11 day system. In the control females 68.5% of the animals were bred during the first 25 days and 77.5% of the Lutalyse® cows could have been inseminated after a combination of breeding after the first injection and injecting all animals not bred and breeding after the second injection.

Another factor examined was the effect of season upon conception rates in Brahman females. During the late spring and early summer more ($P < .005$) Brahman females conceived (61.4%) than in the late fall (36.2%). For optimum results artificial insemination with estrus synchronization or simple estrus detection the breeding season for Brahman cattle needs to be during the late spring through the summer.

In the comparison of Alfaprostol and Lutalyse® conception rates and synchronization rates were similar (Table 3). Ovarian status did not affect conception rate but a higher ($P < .005$) synchronization rate was found in animals with a corpus luteum (83.2%) compared with cows with follicular activity (57.2%) and cows with no activity (39.1%). Selection of animals by ovarian activity for estrus synchronization can improve synchronization rates.

Table 1. Estrus response to Lutalyse®

	#	%
First injection only	25/111	22.5
Second injection only	23/111	20.7
First and second injections	38/111	34.2
All responders	86/111	77.5
No response	25/111	22.5
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All first injection	63/111	56.8
All second injection	61/111	55.0

Table 2. Possible breeding response

	#	%
Possible breeding after 1st injection	63/111	56.8
Cows responding only to 2nd injection	23/111	20.7
Total possible bred	86/111	77.5
Total bred on double injection system	61/111	55.0

Table 3. Comparison of Alfaprostol and Lutalyse® conception and synchronization rates

Herd	Alfaprostol (5 mg)			Lutalyse®		
	Conception Rate	Synchronization		Conception Rate	Synchronization	
Brahman 1	18/24 (75.0%)	24/39 (61.5%)		18/25 (72.0%)	25/39 (64.1%)	
Brahman 2	8/9 (88.9%)	9/17 (52.9%)		6/12 (50.0%)	12/15 (80.0%)	
All Brahman	26/33 (78.8%)	33/56 (58.9%)		24/37 (64.9%)	37/54 (68.5%)	
Brangus 1	13/23 (56.5%)	23/62 (37.1%)		11/20 (55.0%)	20/61 (32.8%)	
Brangus 2	8/37 (21.6%)	37/47 (78.7%)		17/38 (44.7%)	38/48 (79.2%)	
Brangus 3	28/59 (47.5%)	59/71 (83.1%)		34/56 (60.7%)	56/63 (88.9%)	
All Brangus	49/119 (41.2%)	119/180 (66.1%)		62/114 (54.4%)	114/172 (66.3%)	
All females	75/152 (49.3%)	152/232 (65.5%)		86/151 (57.0%)	151/226 (66.8%)	