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## Relative Effectiveness of Estrous Synchronization Methods in the Ewe

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RELATIVE EFFECTIVENESS OF ESTROUS SYNCHRONIZATION  
METHODS IN THE EWE  
(PROGRESS REPORT)

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SHEEP 85-14

Summary

Two methods of synchronizing estrus, single injection and dual injections of prostaglandin  $F2\alpha$  (PGF)<sup>1</sup> were compared. Relative effectiveness was determined by measuring number of ewes conceiving by day after last injection, number of ewes conceiving by day after initial exposure to fertile rams, dates of first mating and number of lambs born per ewe lambing. No significant differences in parameters measured due to treatments were found. However, trends suggest synchronization did occur, especially observable in dates of first mating. Lack of statistical differences may be due to unexpected synchrony in the control treatment which would not be consistent with previous reports from this station.

(Key words: Estrus, Ewe, Prostaglandin  $F2\alpha$ , Synchronization)

Introduction

The value of synchronization is in reducing the breeding period. Prostaglandin  $F2\alpha$  (PGF) has been demonstrated to effectively synchronize ewes during the normal breeding season. Different methods of synchronizing estrus with PGF have been proposed. The purpose of this trial was to compare the relative effectiveness of a singular PGF injection vs. a dual injection of PGF 10 days apart to a control for synchronizing estrus in the ewe during the normal breeding season.

Experimental Procedure

Purebred Hampshire (n=75) and purebred Columbia (n=72) ewes were randomly allotted to one of three groups: 1-10 mg PGF, 2-10 mg PGF or a control group, during the September-October breeding season. The controls received no injection. The 1-10 mg PGF treatment involved a single 10 mg PGF IM injection given, 4 days after exposure to rams, to ewes which had not mated. The 2-10 mg PGF treatment involved two 10 mg PGF IM injections given 10 days apart with the last injection concurrent with the 1-10 mg PGF treatment. Rams were not allowed with the 2-10 mg PGF treatment ewes until after the second injection. All ewes were exposed to epididymectomized teaser rams for two weeks prior to the 35 day breeding period. A flushing ration

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<sup>1</sup>Lutalyse®, courtesy of The Upjohn Company, Kalamazoo, MI 49001.

consisting of brome grass-alfalfa pasture supplemented with 0.34 kg (0.75 lb) ground corn per head per day was fed during the prebreeding and breeding periods. On day 1 teaser rams were replaced with semen tested purebred Hampshire or Columbia rams, at the rate of 1 ram per 19 ewes, for controls and the 1-10 mg PGF group in single sire purebred groups. Each ram was exposed to a random sample of ewes from each treatment group and data were pooled across rams for analysis. A marking mixture consisting of grease and wool branding paint was applied on the chest area of the ram daily. Breeding marks were taken at 24 hour intervals between 1000-1100 hours. The single injection of 10 mg PGF was given on day 5 (0800 h) as was the second injection for the 2-10 mg PGF group. Rams were removed on day 35 for the control and 1-10 mg PGF treatments and on day 39 for the 2-10 mg PGF group (Table 1).

### Results and Discussion

Parameters measured were days to conception after last injection, days to conception after initial exposure to fertile rams, date of first mating and number of lambs born per ewe lambing.

Table 2 depicts number of ewes conceiving by day after last injection. No statistical difference was found for number of ewes conceiving by day after last injection for treatment, breed or treatment x breed interaction using analysis of variance procedures (Table 3).

A bimodal distribution trend for ewes conceiving by day after last injection does seem to appear for the 1-10 and 2-10 mg PGF treatments which may be representing two estrous periods 17 days apart. This would suggest the ewes were synchronized but only part conceived at the first estrus.

Also of particular notation is the high percent of control ewes conceiving by day 6 which theoretically would not be expected. This may be due to the use of teaser rams prior to the breeding period. Physical contact, sight and smell may have stimulated ewes to show estrus. Teaser rams were with ewes for 14 days. Day 3 for controls would correspond to day 17 after introduction of teaser rams. This was not evident in the treated groups.

Number of ewes conceiving by day after exposure to fertile rams were not statistically different among treatments (figure 1). The Columbia breed conceived earlier than the Hampshire ( $P < .05$ ). The treatment x breed interaction was not significant indicating breeds responded similarly across treatments.

Treatment, breed or the treatment x breed interaction for date of first mating after exposure to rams were not different ( $P > .05$ ). A trend for synchronized mating appeared in the treated groups. Twenty-three and 24 ewes from the 1-10 mg PGF and 2-10 mg PGF groups, respectively, mated on the third day after injection compared to none of the control ewes on a comparable date.

Number of lambs born per ewe lambing did not differ ( $\chi^2 = 0.755$ ) among treatments.

TABLE 1. SYNCHRONIZATION PROCEDURE.

Treatment	Day -14	Day -5	Day 1	Day 5	Day 35	Day 39
Control	Exposed to teaser rams		Exposed to fertile rams	No injection	Rams removed	
1 - 10 mg PGF <sup>1</sup>	Exposed to teaser rams		Exposed to fertile rams	Single Injection <sup>2</sup> PGF	Rams removed	
2 - 10 mg PGF	Exposed to teaser rams	First injection PGF		Second injection PGF and exposed to fertile rams		Rams removed

<sup>1</sup>Lutalyse®

<sup>2</sup>Single injection to ewes not previously marked.

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TABLE 2. NUMBER OF EWES CONCEIVING BY DAY AFTER LAST INJECTION.

Days after Injection	Treatment		
	Control	1 - 10 mg PGF	2 - 10 mg PGF
1	0	2	1
2	5	0	0
3	8	4	2
4	7	2	1
5	4	2	4
6	4	1	3
7	0	1	3
8	0	1	0
9	1	0	1
10	0	0	0
11	0	0	0
12	1	0	0
13	0	0	0
14	0	1	2
15	0	0	1
16	0	1	0
17	0	2	2
18	0	2	3
19	0	2	3
20	0	0	4
21	1	0	1
22	1	0	0
23	0	1	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0
31	0	1	0
32	0	0	0
33	0	0	0
34	0	0	0
35	0	0	0

TABLE 3. LEAST-SQUARES MEANS AND STANDARD ERRORS FOR INTERVALS TO CONCEPTION, DATE OF FIRST MATING AND NUMBER OF LAMBS BORN.

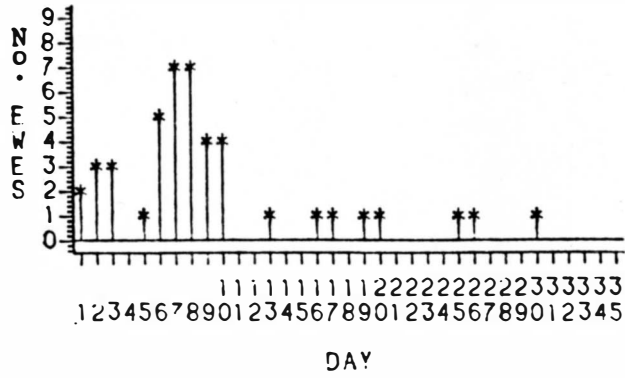
	Days after last Injection to Conception	Days after Exposure to fertile rams to Conception	Julian date of first mating after Exposure to Fertile Rams	Number of Lambs born per ewe Lambing
	L.S.Means±S.E.	L.S.Means±S.E.	L.S.Means±S.E.	L.S.Means
Control	5.92 ± 1.19	9.04 ± 1.04	253.67 ± 0.61	1.83
1 - 10mg PGF	6.77 ± 1.07	10.41 ± 1.02	254.0 ± 0.61	1.78
2 - 10mg PGF	8.78 ± 1.02	8.78 ± 1.03	255.72 ± 0.60	1.81
Hampshire	6.77 ± 1.07	10.78 ± 0.83	254.41 ± 0.49	1.88
Columbia	6.07 ± 0.89	8.05 ± 0.85	254.65 ± 0.50	1.74

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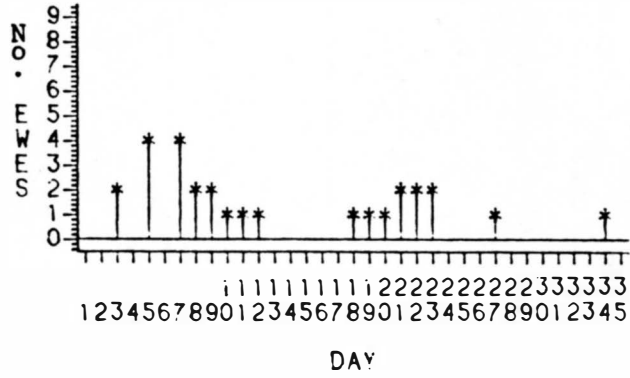
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TRT=CONTROL



TRT=1X10MG PGF



TRT=2X10MG PGF

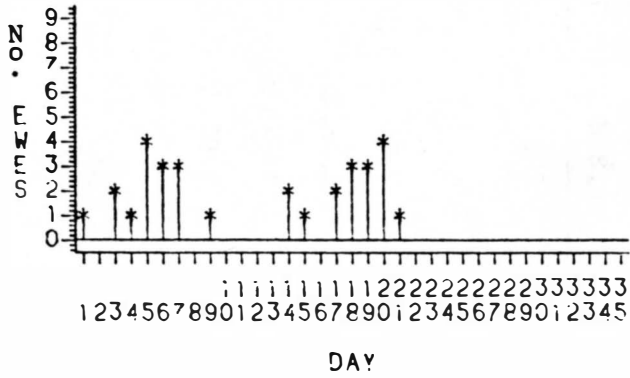


Figure 1. Number of ewes conceiving by day after exposure to fertile rams.

Controls unexpectedly mated and conceived predominately during the first half of the first estrous cycle after exposure to fertile rams. This is not characteristic of past synchronization trials at this station. However, the two methods of synchronizing estrus resulted in similar synchrony of estrus.