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SYNCHRONIZATION OF ESTRUS IN THE EWE WITH
VARIOUS DOSAGES OF PROSTAGLANDIN F2 α

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Summary

Prostaglandin F2 α (PGF¹) was evaluated at various dosages to determine its relative effectiveness to synchronize estrus. The effect of intramuscular injections of 0 (control), 10 and 15 mg PGF during the normal breeding season was studied over a 2-year period using a crossbred ewe flock. Parameters discussed are time to conception after injection during first and second estrous cycles, number of ewes lambing and lambing rate. PGF at 10 and 15 mg was effective in synchronizing estrus between 32 and 80 hours post-injection.

Introduction

The value of synchronization is in producing more uniform offspring by lambing ewes in a concentrated period, attaining effective use of facilities and labor, confining the breeding season and allowing the option, especially in smaller flocks, to move more sheep through existing facilities. Previous research at this station found 15 mg PGF effective in synchronizing estrus. Cost of the compound is an influencing factor in considering the use of PGF. Reducing dosage is one method to reduce cost if the decreased dosage will result in comparable synchronization. This study evaluates the effectiveness of 0, 10 and 15 mg PGF to synchronize estrus.

Procedure

Trials I and II utilized crossbred ewes bred during the normal fall breeding season for each of two consecutive years. Trial II was identical to trial I with the exception all procedures were implemented 14 calendar days later. Two weeks prior to the start of the trial, epididymectomized teaser rams, at the rate of one ram to 30 to 40 ewes, were placed with Targhee, Finn x Targhee and Suffolk x Targhee ewes grazing brome-grass-alfalfa pasture and ewes were started on a flushing ration of 3/4 pound corn per ewe and ram per day. Flushing continued until day 36 (day 1 = first day of breeding). On day 1, the teaser rams were removed and intact fertile rams, at the rate of one ram per 10 ewes, were placed with the ewes. Breeding marks were recorded and intact rams were greased on the lower brisket with a mixture of one-half branding fluid and one-half axle grease once daily at time of flushing. Ewes were randomly allotted to the three treatment groups. On day 5, ewes which had not mated during the preceding 4-day period, assessed

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¹Furnished courtesy of The Upjohn Company, Kalamazoo, Michigan.

by an absence of a breeding mark, received 0 (no injection), 10 or 15 mg prostaglandin F2 α (PGF) intramuscularly, depending on their prior treatment group assignment. Rams were removed on day 36. Following the breeding season, both groups were combined into one flock and managed as a single flock through lambing. Lambing date, lamb sex, birth weight and type of birth were recorded for ewes which lambled. Lambing dates were used to verify breeding dates based on a calculated gestation length of 148 days.

Means and percentages are presented, but statistical analyses have not been completed.

Results and Discussion

Lambing results are shown in table 1. Percentage of ewes lambing on the treatments varied by trial and year with no treatment effect apparent. No trend in lambing rate was observed due to treatment or year. Of the open ewes, some were never bred, indicating no estrous activity, while others were repeatedly bred but never settled.

Percentage of ewes conceiving within specified time periods after injection during the first estrous cycle for trials combined across years is shown in figure 1. At 56 hours post-injection, the percentage of ewes conceiving was 10.8, 45.4 and 48.9 for the control, PGF-10 and PGF-15 groups, respectively. This indicates prostaglandin F2 α at 10 and 15 mg was effective for synchronizing estrus. The difference in response between the PGF-10 and PGF-15 groups at 176 hours post-injection was due to ewes which were not cycling and ewes which bred but did not conceive.

Table 2 depicts the percentage of ewes conceiving post-injection by trial, treatment and year for cycles 1 and 2. PGF was effective in synchronization of estrus at both the 10- and 15-mg dosage. Differences in effectiveness of synchronization between PGF-10 and PGF-15 were relatively small. Second cycle breedings occurred approximately 17 days after synchronization in the first cycle. Thus, synchronization of breeding also occurred in the PGF groups during the second estrous cycle if ewes had not conceived previously. Table 3 is a summary of data in table 2, combining years and trials. Combined values indicate similar synchronization results for both PGF levels tested.

TABLE 1. LAMBING RESULTS - PGF SYNCHRONIZATION

	Trial I			Trial II		
	Control	PGF-10 ^a	PGF-15 ^b	Control	PGF-10	PGF-15
<u>Year 1 (1981-82)</u>						
Number of ewes						
Exposed	30	29	30	32	29	32
Received injection	25	29	28	32	24	26
Lambled (%)	26 (86.7)	26 (89.6)	28 (93.3)	28 (87.5)	27 (93.1)	28 (87.5)
Lambing rate						
No. per ewe lambing	1.92	1.81	1.93	1.86	1.67	1.68
<u>Year 2 (1982-83)</u>						
Number of ewes						
Exposed	23	25	25	26	23	23
Received injection	15	19	20	21	16	22
Lambled (%)	21 (91.3)	23 (92.0)	20 (80.0)	24 (92.3)	22 (95.6)	22 (95.6)
Lambing rate						
No. per ewe lambing	2.09	1.86	1.90	1.62	1.68	1.77

^a Ten mg prostaglandin F2 α injected intramuscularly on day 5.

^b Fifteen mg prostaglandin F2 α injected intramuscularly on day 5.

^c Ewes that had not mated prior to day 5.

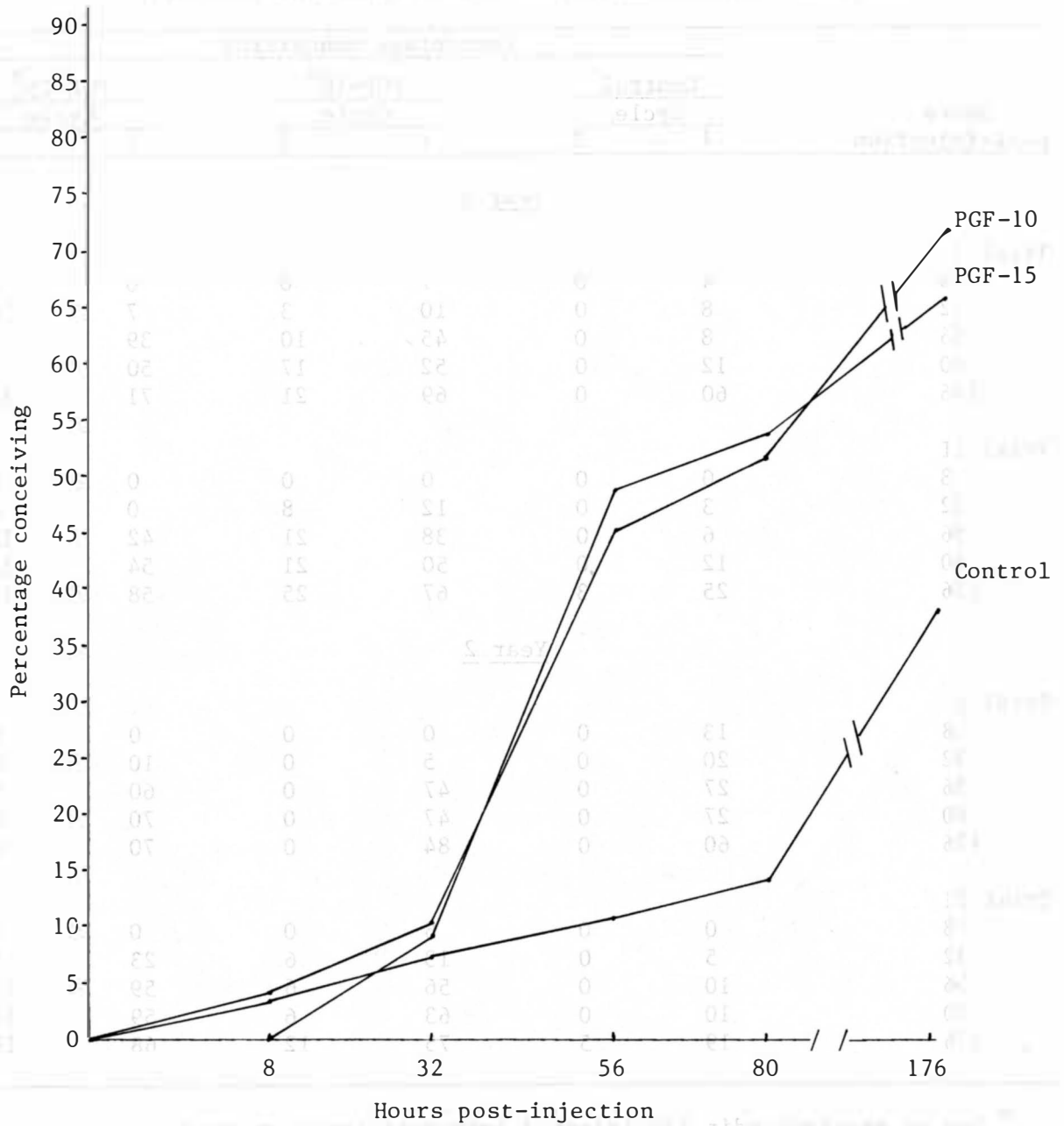


Figure 1. Percentage of ewes conceiving within specified time periods after injection, first cycle. Trials combined across years.

TABLE 2. SYNCHRONIZATION OF ESTRUS FOLLOWING TREATMENT

Hours post-injection	Percentage conceiving					
	Control		PGF-10 ^a		PGF-15 ^b	
	Cycle		Cycle		Cycle	
	1	2	1	2	1	2
<u>Year 1</u>						
Trial I						
8	4	0	7	0	0	0
32	8	0	10	3	7	0
56	8	0	45	10	39	4
80	12	0	52	17	50	7
176	60	0	69	21	71	18
Trial II						
8	0	0	0	0	0	0
32	3	0	12	8	0	0
56	6	0	38	21	42	12
80	12	0	50	21	54	15
176	25	3	67	25	58	19
<u>Year 2</u>						
Trial I						
8	13	0	0	0	0	0
32	20	0	5	0	10	0
56	27	0	47	0	60	0
80	27	0	47	0	70	0
176	60	0	84	0	70	0
Trial II						
8	0	0	6	0	0	5
32	5	0	13	6	23	5
56	10	0	56	6	59	14
80	10	0	63	6	59	18
176	19	5	75	12	68	18

^a Ten mg prostaglandin F2 α injected intramuscularly on day 5.

^b Fifteen mg prostaglandin F2 α injected intramuscularly on day 5.

TABLE 3. SYNCHRONIZATION OF ESTRUS FOLLOWING TREATMENT
(TRIALS COMBINED ACROSS YEARS)

Hours post-injection	Percentage conceiving					
	Control Cycle		PGF-10 ^a Cycle		PGF-15 ^b Cycle	
	1	2	1	2	1	2
8	3.2	0	3.4	0	0	1.0
32	7.5	0	10.2	4.5	9.4	1.0
56	10.8	0	45.4	10.2	48.9	7.3
80	14.0	0	52.3	12.5	57.3	10.4
176	38.7	2.2	72.7	15.9	66.7	14.6

^a Ten mg prostaglandin F2 α injected intramuscularly on day 5.

^b Fifteen mg prostaglandin F2 α injected intramuscularly on day 5.