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Control of Lambing Through Synchronization of Estrus and Induction of Parturition

A. L. Slyter
South Dakota State University

K. F. Hoppe

CONTROL OF LAMBING THROUGH SYNCHRONIZATION OF ESTRUS AND INDUCTION OF PARTURITION

A. L. SLYTER AND K. F. HOPPE

Department of Animal and Range Sciences
Agricultural Experiment Station

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Summary

Two trials were conducted to evaluate the effectiveness of synchronization of estrus with 1 or 2 injections of prostaglandin F2α (PGF) plus induction of parturition with flumethasone (FLU) on grouping of lambing. Synchronization of estrus involved either control (no injection), 1-10 mg injection of PGF or 2-10 mg injections of PGF. Lambing induction treatment was either control (no injection) or 2 mg of FLU. One injection of PGF appeared as effective as 2 injections. No estrous synchronization plus FLU resulted in 83% lambing in a 9 d period compared to 62% for the double control. The combination of one injection of PGF plus FLU resulted in 59% lambing in 9 d in trial 1 and 75% in trial 2. With this combination in trial 1, 23% lambed on one day. None of the treatments appeared to affect the percentage lambing or the number of lambs born per ewe.

These results indicate that grouping of lambing is possible through use of intensive management practices.

Key Words: Ewe, Synchronization, Induction of Lambing, Flumethasone, Prostaglandin F2α.

Introduction

The ability to program the time of birth for our livestock species offers several advantages to the producer. By concentrating lambing into a short defined period or periods it allows better utilization of labor and facilities. In addition, it should increase lamb survival since better supervision can be maintained for these specific periods. Furthermore, lambs are grouped more closely by age and can be more uniformly managed in such groups. Two trials (1983-84 and 1984-85) were conducted to study the effectiveness of prostaglandin F2α[1] to synchronize estrus and flumethasone[2] to induce parturition in a planned lambing program.

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[1]Lutalyse® supplied courtesy of the Upjohn Co., Kalamazoo, MI 49001.

[2]Flucort ©, Diamond Laboratories Inc., Des Moines, Iowa 50304.

Experimental Procedure

Trial 1 (1983-84)

Purebred Hampshire and Columbia ewes (n=145) were exposed to teaser rams for 2 weeks preceding the start of the breeding season (early September). Flushing was initiated when the teaser rams were introduced and continued for approximately 5 weeks. Teaser rams were replaced with intact semen tested rams (day 1, 1600 hr) and remained with the ewes for 35 days. Breeding utilized single sire groups with a maximum of 16 synchronized ewes per ram for the first week. Ewes were then regrouped into larger sire groups (maximum 25-30 ewes). Hampshires were exposed one week prior to Columbias. Breeding marks were recorded daily and all ewes not marked (n=111) by 0800 hrs of day 5 were injected with 10 mg of prostaglandin F2α (PGF). Once per week at lambing time, ewes calculated to be on day 140 through 146 of gestation were injected with 2mg of flumethasone (n=94).

Trial II (1984-85)

Purebred Hampshire and Columbia ewes (n=147) were again utilized in this trial. Time of the breeding season, teaser ram usage and flushing were similar to trial 1. Ewes were randomly allotted within breed to one of three breeding treatments: (1) control; (2) 10 mg of PGF; or (3) two 10 mg injections of PGF. Treatment 2 was similar to the PGF protocol used in trial 1, i.e., all ewes not mated by day 5 were injected. In treatment 3 all ewes received 2 injections of PGF ten days apart. Timing among treatments was coordinated so that ewes in treatment 2 received their injection on the same morning as ewes in treatment 3 received their second injection. Intact rams were therefore introduced in treatments one and two 4 calendar days prior to the time they were introduced with treatment 3 ewes. All treatments were allowed a 35 day breeding period.

Once per week at lambing time, all ewes calculated to be on days 140 through 146 of gestation were randomly split within breed into one of two induction treatment groups: (1) control - no treatment and (2) induced - 2 mg flumethasone intramuscularly.

This arrangement allows evaluation of six outcome groups based on three synchronization treatments and two induction treatments.

Results

Trial 1. One hundred nineteen of the 145 ewes exposed lambed; four died prior to lambing for unrelated reasons, two aborted and 20 were open. Eighty-one percent of the ewes receiving flumethasone lambed on day 2 to 4 following injection. Adjusting for the week difference in the start of the breeding season, 43 (30%) lambed in a 4-day period and 70 (59%) lambed within a 9-day period. The largest number on any one day was 27 (23%). Treatment resulted in a cyclic lambing pattern at approximately a 7 or 14 day interval (figure 1). Although the total lambing period (36 days) was not markedly shorter than would be expected with a 35 day breeding exposure, this approach did result in weekly grouping of parturitions.

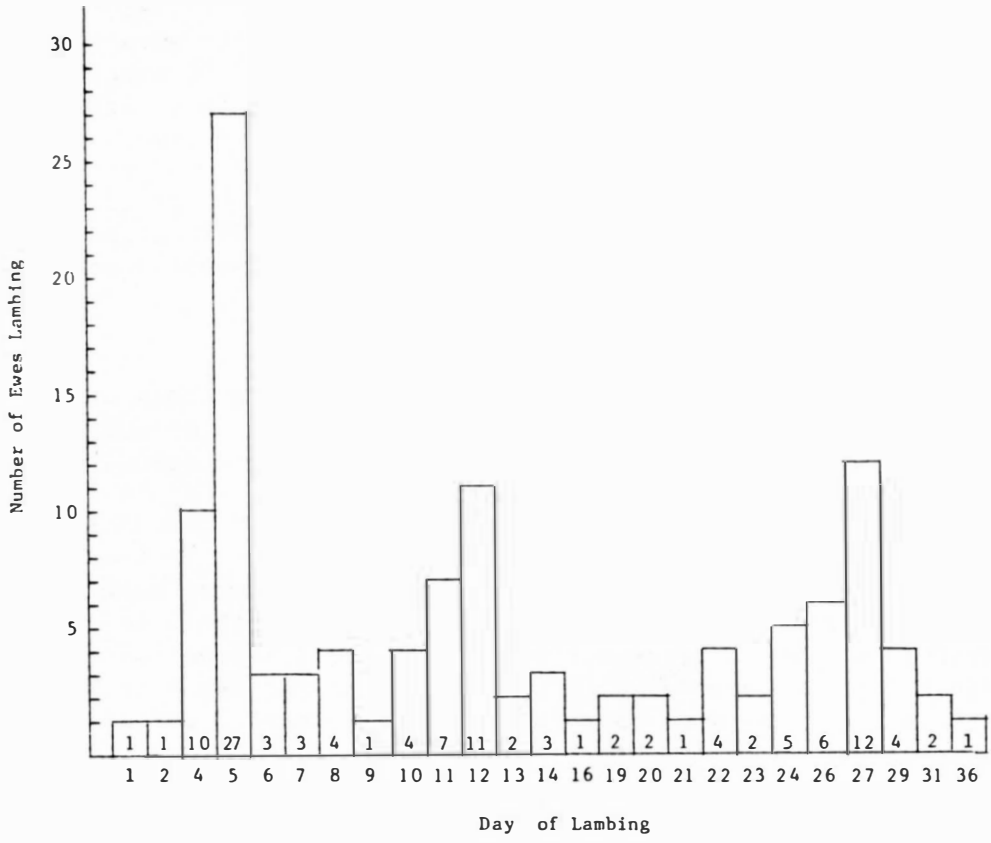

Figure 1. Number of ewes lambing per day of the lambing season. Days when no ewes lambed are omitted from the legend. (Trial 1.)

Trial 2. Trial 2 results are shown in figure 2. The best grouping of lambing was in the Control-Flumethasone treatment with 83% of the ewes lambing in a 9 day period. This was followed by 75% of the 1PGF-Flumethasone group lambing in 9 days. This is 16% more than for ewes treated similarly in trial 1. Sixty-two percent of the Control-Control ewes lambed in 9 days. Thus it appears the ewes were in good breeding condition and conceived early in the exposure period in a somewhat naturally synchronized fashion. Flushing and teasing may have been the reason for the positive response. Two injections of PGF did not appear to improve grouping of lambing in this trial compared to a single injection of PGF. Treatment did not affect the number of lambs born per ewe exposed or per ewe lambing or the percentage of ewes lambing (table 1).

The mean Julian lambing date for treatments ranged from d 34.5 to d 41. Since ewes receiving 2 PGF injections were placed with intact rams four days later than those in the other groups by experimental design their mean lambing date would be expected to be 4 d later.

Conclusions

Grouping of lambing was achieved with a combination of treatment of synchronization of estrus using PGF and induction of parturition using flumethasone in both trials. Control groups in trial 2 also lambed in a rather synchronized fashion as a result of chance or use of the teaser rams and flushing management. Thus the difference in results between control and treated groups were not as large as expected in trial 2.

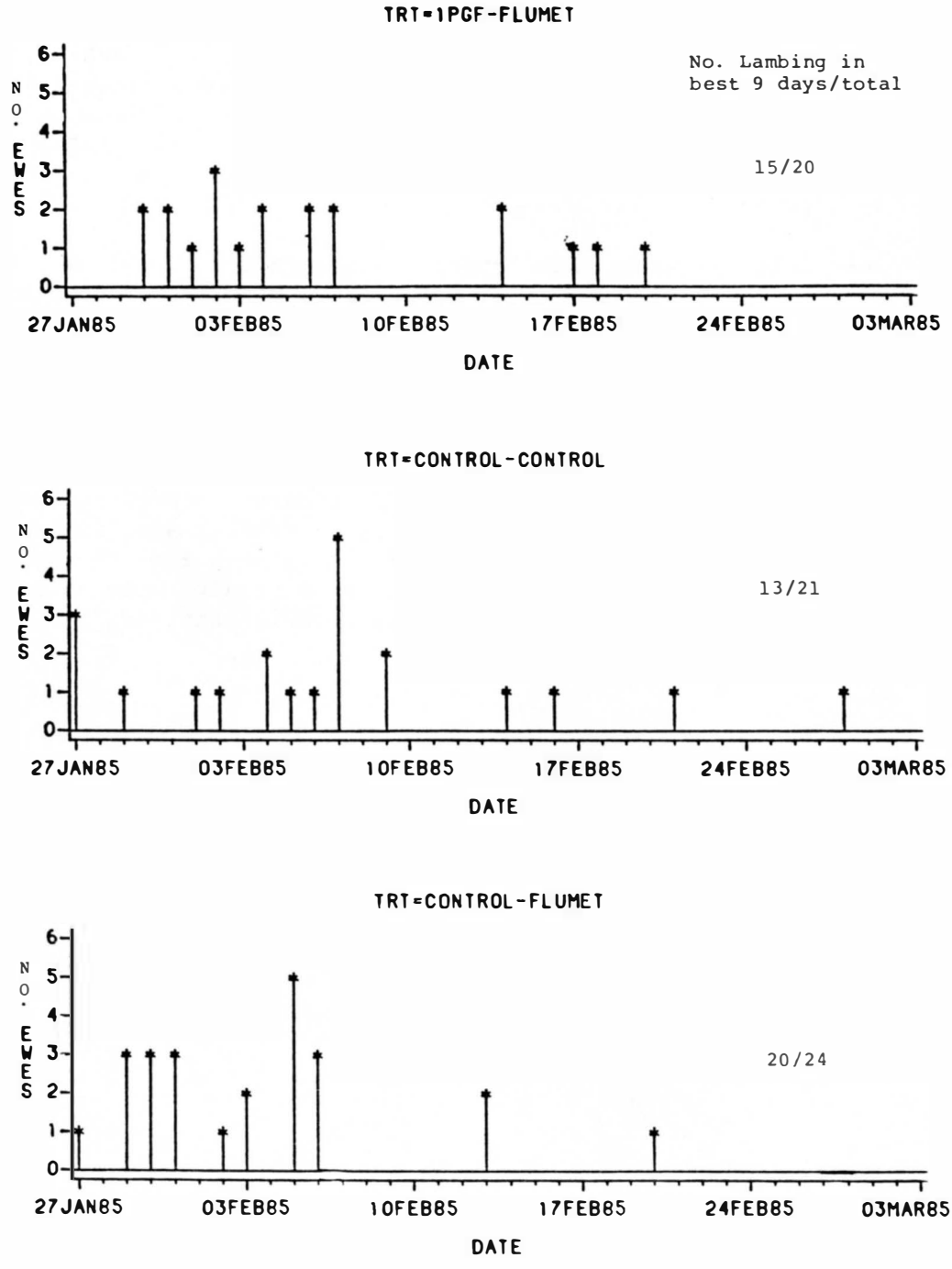

Figure 2. Number of ewes lambing per day by treatment group. (Trial 2.)

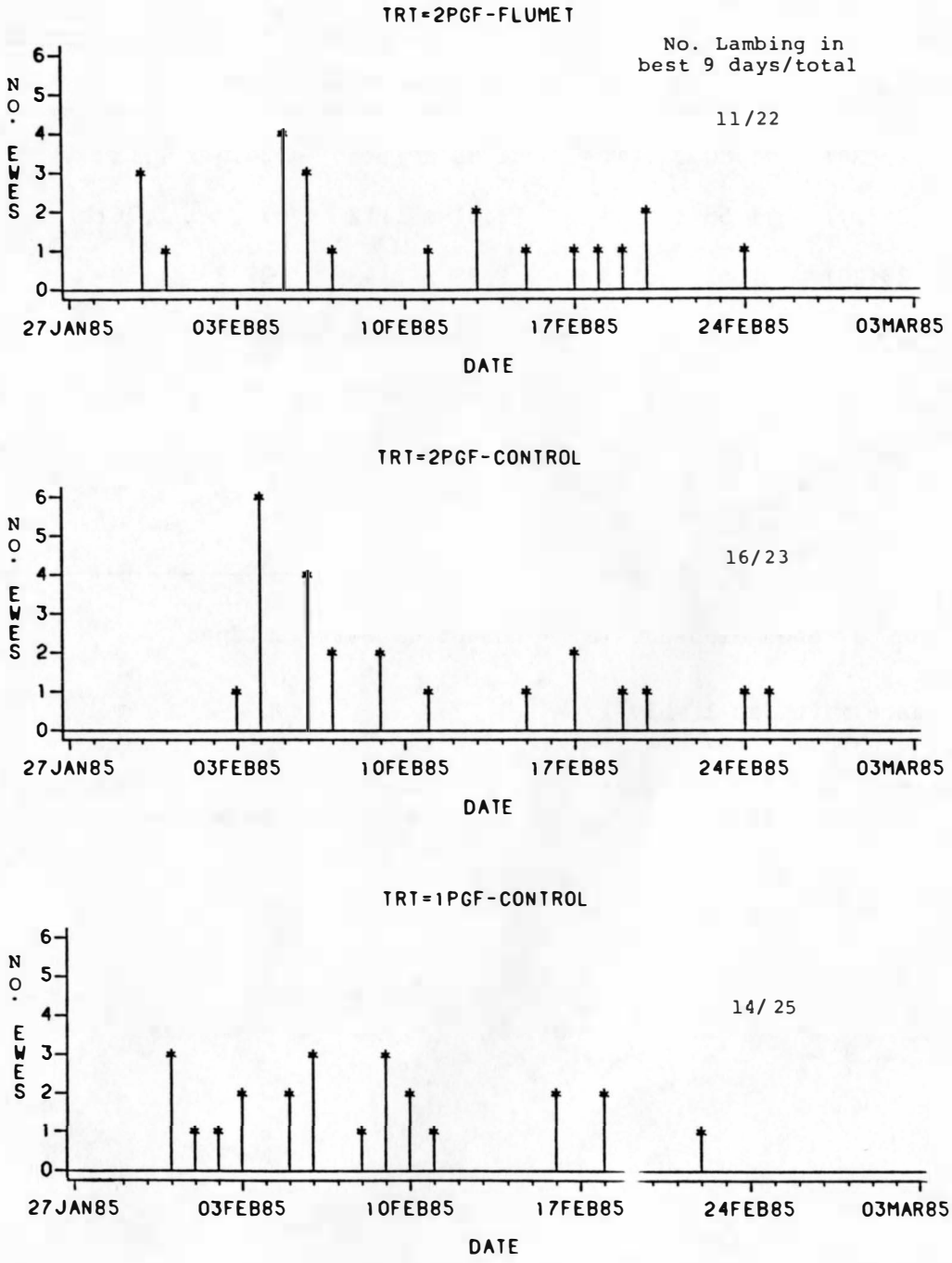

Figure 2 (cont). Number of ewes lambing per day by treatment group. (Trial 2.)

TABLE 1. EFFECT OF TREATMENT ON LAMBING PERFORMANCE (TRIAL 2)

Trt.	N(N)[1]	No. Lambs/EE	No. Lambs/EL	Lambing Date[2]	% Lambing
C-F[3]	25(24)	1.80 ± .141	1.88 ± .125	34.5 ± 1.15	96.0
C-C	24(21)	1.58 ± .158	1.81 ± .112	37.7 ± 1.76	87.5
1PGF-F	23(20)	1.65 ± .185	1.90 ± .143	37.3 ± 1.50	87.0
1PGF-C	25(25)	1.68 ± .095	1.68 ± .095	40.0 ± 1.58	100.0
2PGF-F	26(22)	1.65 ± .175	1.95 ± .123	40.6 ± 1.65	84.6
2PGF-C	24(23)	1.63 ± .157	1.70 ± .147	41.0 ± 1.46	95.8
Total	147(135)				91.8%

[1] N = number of ewes exposed, (N) = number of ewes lambing.

[2] Julian date with Jan 1 = 1.

[3] C = Control, F = Flumethasone, 1PGE = 1-10 mg injection of prostaglandin F2α, 2PGF = 2-10 mg injections of prostaglandin F2α ten days apart.