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Controlled Parturition in the Ewe

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A Progress Report

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The ability to control the time of parturition offers the sheep producer a valuable management tool to increase the efficiency of his operation. In small flocks controlled parturition could be used for the entire flock. In larger flocks controlled parturition could be used effectively as a clean-up tool by inducing parturition in all ewes not lambing by 141 days after removal of rams from the breeding flock. Advantages which the producer might obtain from controlled lambing include more efficient utilization of available space and labor, less death loss due to increased supervision and more uniform lamb crops.

Experimental Procedure

During the breeding season of 1973 (August 20 through October 20) breeding dates were identified for 117 purebred and crossbred ewes by the use of marker rams with grease-painted briskets. Ewes were checked twice daily for evidence of breeding. Colors used for marker rams were changed every 17 days. The last observed marking date was determined to be a ewe's breeding date. After breeding dates were obtained, ewes were randomized within day of breeding into three groups of 39 ewes.

On day 141 of gestation, as determined by breeding dates, ewes were weighed and given their respective treatment. A blood sample taken by jugular vein puncture was obtained prior to treatment and once each 24 hours until lambing. Treatments consisted of 2 mg flumethasone, 15 mg prostaglandin $F_{2\alpha}$ (PGF) and a physiological saline control. All treatments were given intramuscular (I.M.) in 4 cc volumes. Ewes were then checked hourly for parturition. Blood samples were assayed by radioimmunoassay for estrogen and progesterone.

Results and Discussion

Table 1 contains data concerning prelambing ewe weight, weight of lambs per ewe, the average number of lambs per ewe, number of male lambs vs. females and a lambing difficulty score. Analysis of variance of these data indicated that there were no significant differences ($P>.01$) in these parameters between treatment groups.

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Table 2 lists the mean hours from treatment to parturition for all ewes treated as well as the standard error of the mean. The mean hours from treatment to parturition were 60.14 ± 8.55 for flumethasone-treated ewes and 118.73 ± 11.62 for PGF-treated ewes. This compares to 145.18 ± 12.86 hours for the saline control ewes. Analysis of variance indicated that there was a significant difference between treatments and that both flumethasone- and PGF-treated ewes had significantly shorter ($P<.05$) intervals from treatment to parturition than did saline control ewes.

Most producers are interested in the percentage of ewes that might be expected to lamb within a specified time period after treatment. Seventy-two hours is generally accepted as the outer limit from treatment to parturition. Those lambing more than 72 hours after treatment are not considered to have been induced to lamb. Under these criteria 89% of the flumethasone-treated ewes and 33% of the PGF-treated ewes were induced to lamb. Only 8% of the saline control ewes lambed within 72 hours of treatment. The percentage of both flumethasone- and PGF-treated ewes induced was significantly higher than the percentage of control ewes lambing within 72 hours ($P<.01$) of treatment. These results are presented in table 3.

Levels of estrogen and progesterone were similar for all treatment groups both initially and 24 hours prior to parturition. The similarity between induced groups and controls in the level of estrogen and progesterone would suggest that parturition events were apparently normal in induced sheep.

These data indicate that flumethasone is effective for the induction of parturition in the ewe at the levels given. Approximately 90% of treated ewes can be expected to lamb within 60.14 ± 8.55 hours. PGF also will induce parturition. However, the percentage responding at the levels and time period given is much lower than for flumethasone. Additional research is required to establish optimum levels of PGF for effective induction of parturition. Field trials with flumethasone induced lambing need to be conducted to substantiate the results obtained experimentally.

Table 1. Average Prelambing Ewe Weights, Lamb Weight Per Ewe, Number of Lambs Per Ewe, Lambing Difficulty Score and Sex of Lambs

Treatment	Avg. ewe wt. (kg)	Avg. lamb wt. per ewe (kg)	Avg. number lambs per ewe	Number of lambs		Lambing score[a]
				Male	Female	
Flumethasone	66.0	4.31	1.6	31	30	1.46
Prostaglandin $F_{2\alpha}$	69.0	4.31	1.7	35	31	1.43
Saline	70.5	4.27	1.6	33	28	1.69

[a] 1-No assistance, ..., 4-Extremely difficult.

Table 2. Average Interval from Treatment to Parturition for All Ewes

Treatment	Mean hours	Standard error
Flumethasone	60.14[a]	8.55
Prostaglandin $F_{2\alpha}$	118.73[a]	11.62
Saline (control)	145.18[b]	12.86

[a,b] Means with different superscripts differ significantly, $P<.05$.

Table 3. Percent of Ewes Lambing Within 72 Hours Post-Treatment and Their Average Interval From Treatment to Parturition

Treatment	Number	Lambed within 72 hr.		Mean hours	S.E.
		%	No.		
Flumethasone	39	89[a]	35	50.9	2.3
Prostaglandin $F_{2\alpha}$	39	33[a]	13	41.7	5.9
Saline (control)	39	8[b]	3	38.5	10.0

[a,b] Lambing percentages with different superscripts differ significantly, $P<.01$.