

Reproductive Performance of Ewes Involved in A Twice-Yearly Lambing Program

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Story in Brief

Over a four year period, 182 ewes produced 1,049 lambs or an average of 1.86 lambs per ewe annually. Seven hundred and ninety five or 75.8 percent, of these lambs were produced in the spring lambing season. Of 537 ewes having an opportunity to conceive in the spring, only 188, or 35 percent, actually lambled the following season; whereas, of the 591 ewes, 495, or 85 percent, conceived in the fall and lambled in the spring. These results are associated with the fact that 71 percent of the ewes lambing in the fall rebred and conceived, but only 23 percent of the spring lambing ewes rebred and conceived. Also, spring lambing ewes required 27 more days to rebreed post-partum and had a 22 day longer interval from lambing to conception than did the fall lambing ewes.

A comparison of breed differences indicated post-partum performance was low for all three breeds studied. Of these breed groups, a lower percentage (16 percent) of the Rambouillet group lambled, rebred and conceived in the spring; however, in the fall a larger percentage (81 percent) of the Rambouillet ewes conceived post-partum than either of the other breed groups. Just the reverse trend was observed in Dorset ewes. The interval from lambing to conception was slightly shorter for Rambouillets and longest for crossbred ewes in both seasons. With respect to lamb production, crossbred ewes produced more lambs per ewe per year (2.07) than either the Dorset or Rambouillet ewes, 1.77 and 1.73, respectively. Also, crossbred ewes produced more lambs per ewe lambing in both the spring and fall seasons; however, Rambouillet ewes raised a larger percent of lambs born.

Introduction

Presently sheepmen with limited capital and resources are searching for management practices whereby they can intensify their production programs. In general, two methods may be employed: (1) increase the number of lambs born per ewe at each lambing, or (2) increase the number lambings per year. Since a ewe has difficulty producing and raising three or more lambs at a time, the latter production method would appear more feasible.

Ewes have been known to produce more than one lamb crop within a one year period. Possible programs include lambing every six months,

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thus producing two lamb crops within a one year period, or lambing every eight months which results in three lamb crops within a two year period. In 1963, Oklahoma State University initiated a program of twice-yearly lambing at the Fort Reno Livestock Research Station to evaluate the problems associated with such a program. This paper presents results relative to the ewe reproductive performance under this program.

Materials and Methods

The breeding flock consisted of 182 ewes, of which 60 were of Dorset breeding, 60 of Rambouillet breeding, and 62 of the cross between these two breeds. Ten crossbred ewes were obtained from the existing ewe flock at Fort Reno. The other 52 crossbred ewes and 60 Dorset ewes were purchased from various flocks within Oklahoma. The 60 Rambouillet ewes were obtained from several sources in Texas. In 1963, sixty spring-born ewes (20 of each breed group) were purchased. Sixty fall-born ewes of similar origin were obtained about six months later. In 1964, another purchase of 60 spring-born ewes completed the breeding flock.

The ewes were purchased from flocks that normally were lambed both in the fall and late winter or early spring. As the ewes were obtained, they were added to the flock and each group was first bred when they were approximately one year of age. Thus, part of each breed group were bred first in the fall and the remainder during the spring seasons.

The following breeding, lambing and management procedures were followed:

1. Figure 1 illustrates the breeding and subsequent lambing periods used in this twice-yearly lambing program. Spring breeding extended for a 60 day interval beginning on April 20 and continuing through June 19; thus, fall lambing began about September 15 and ended about November 15.
2. Similarly, fall breeding extended for 60 days from October 20 through December 19, and spring lambing extended from March 15 through May 15.
3. Ewes lambing more than ten days prior to the next breeding season were exposed to a vasectomized teaser ram daily to detect estrous



Figure 1. Breeding and Subsequent Lambing Periods Associated with a Twice-Yearly Lambing Program.

until the breeding season began, after which they were exposed to fertile rams. Later lambing ewes were exposed to a fertile ram approximately ten days after lambing. Both marking harness and visual observations were used to detect ewes in heat.

4. For approximately three days post-partum, the ewe and her lamb (s) were confined to a small pen. Afterwards, they were transferred to a large pen with about ten other ewes and their lambs. Here the lambs were docked, and after approximately one week, the animals were released into the main lots.
5. All lambs were weighed biweekly and were weaned when they reached a minimum age of 66 days and a minimum weight of 50 pounds. Upon weaning, the lambs were moved to a finishing feedlot.
6. In an effort to make a record of ewe's condition relative to fatness, all ewes were weighed and scored (for fat covering) prior to each lambing season and at the end of each breeding season.
7. All ewes were shorn about one week before spring lambing began and tagged about one week before fall lambing began.
8. Fall lambing ewes were supplemented with one pound of milo daily plus alfalfa hay during the last month of gestation and during the lactation period. In addition, the ewes and their lambs were allowed to graze on wheat pasture. After weaning the ewes were returned to a separate pasture with the other dry ewes.
9. Spring lambing ewes were similarly supplemented and were allowed to graze on small grain or a bermuda grass-alfalfa pasture. However, in an effort to reduce internal parasite infestation in the spring-born lambs, they were not allowed to graze but were retained in the dry lot while the ewes grazed.

Results and Discussion

Table 1 presents a summary of the reproductive performance of ewes under this program. Records were available for the lamb crops produced

Table 1. Summary of Reproductive Performance of Ewes on a Twice-Yearly Lambing Program.

Item Year	Fall 1964,65,66,67	Spring 1965,66,67,68	Total 1964-68
No. Ewe seasons ¹	537	591	1,128
No. Ewes lambing	188	495	683
% Ewes lambing	35	84	60
No. lambs born	254	795	1,049
Lambing rate ²	1.35	1.60	1.53
No. lambs reared	202	726	928
% lambs reared	79.5	91.3	88.5

¹ Number of records available

² Based on ewes that lambed

from the fall of 1964 to the spring of 1968, inclusive. In that time period the equivalent of 1,128 ewes had an opportunity to lamb, but only 683 or 60 percent actually lambed. These 683 ewes produced 1,049 lambs, or an average of 1.53 lambs per ewe lambing. The survival rate on these lambs was 88.5 percent or, of the 1,049 lambs, 928 were reared.

When one figures that one ewe in the total constitutes two ewe seasons, then 564 ewes had an opportunity to lamb twice each year. Using these data, each ewe in the flock produced an average of 1.86 lambs per year. An estimate of average herd production in Oklahoma would be approximately 1.15 lambs per ewe. Although the figure 1.86 represents a marked increase in production, the lambing rate potential should be approximately double that of a normal production program. Since this figure is not double, where does the program fall short of its potential?

Spring vs. Fall Performance

Table 1 indicates a marked difference in the two seasons' performances. Of the 537 ewes having an opportunity to lamb in the fall, 188 or 35 percent lambed; whereas, in the spring 84 percent or 495 of 591 ewes lambed. These results are in response to the breeding performance in the alternate season, i.e., ewes lambing in the fall season must breed and conceive in the spring and vice versa. The number of ewes lambing in the fall indicates lower conception performance in the spring.

The primary emphasis should be placed on getting a ewe to lamb and then rebreed in time to produce another lamb the next season. Table 2 presents data collected on ewe post-partum performance. Of the 188 ewes lambing in the fall, 159 or 85 percent remated; whereas, only 50 percent (248 of 495 ewes) remated in the spring. From these data, more ewes are likely to become pregnant in the fall than in the spring. Of the 188 ewes lambing in the fall, 134 or 71 percent rebred and conceived, while only 113 of the 495 (23 percent) ewes lambing in the spring con-

Table 2. Post-Partum Breeding Performance of Ewes Involved in a Twice-Yearly Lambing Program.

	Fall	Spring
No. ewes lambing	188	495
Av. lambing date	Oct 12	Apr 4
No. ewes mating	159	248
% ewes mating	85	50
Av. int. lambing to first mating	32	59
No. lamb., rebred, conc. ¹	134	113
% lamb., rebred, conc. ¹	71	23
Av. int. lamb. to conc.	44	66
Av. conc. date ¹	Nov 29	June 1

¹ Indicates those ewes that lambed, rebred and conceived

ceived. Relative to lamb production, 795 or 75.8 percent of the 1,049 lambs produced under this program were born in the spring season. These differences indicate that the ewes were more sexually active and fertile in the fall. Since the ewe's natural breeding period is in the fall, one could expect these observations. More information is obtained when studies are made of the intervals from lambing to first mating and conception.

Intervals Associated with the Program

In order to sustain a continuous program of twice-yearly lambing, a ewe must lamb, rebreed and conceive within 35 days. A ewe on such a program will carry lambs for 294 days out of the year (147 day gestation period); thus, within the remaining 71 days, she must lamb, rebreed and conceive twice. Table 2 presents averages relative to these post-partum intervals. Ewes lambing and remating in the fall had an average interval of 32 days to first mating. This length would allow slightly more than half of the ewes to remate within the required limits outlined; however, the spring interval is an average of 27 days longer or 59 days. This interval length lowers the efficiency or potential of the program.

An examination of the interval from lambing to conception indicates that a large percentage of the ewes in both the spring and the fall did not conceive soon enough to maintain a successful program over a period of years. Ewes that conceived required an average of 44 days post-partum in the fall but required 22 additional days or 66 days to conceive in the spring.

The evaluation of this program indicates where further studies need to be done. Before a program of twice-yearly lambing can be successfully installed into production, these intervals, especially the intervals within the spring season, need to be shortened. Ways need to be discovered to increase the sexual activity and fertility of ewes in the spring season.

Breed Comparisons

One of the primary objectives of the program was the evaluation of the performance of the three breed groups. Table 3 summarizes the performance of the three breeds within each season. A smaller percentage of the Rambouillet ewes lambed in the fall than either Dorset or crossbred ewes, indicating that less Rambouillet ewes conceived in the spring. Although approximately the same percentage of the three breeds lambed and remated in the fall, fewer Dorset ewes (56 percent) conceived to these matings than either crossbred (77 percent) or Rambouillet ewes (81 percent). The average intervals from lambing to first mating and conception were approximately the same length for the three breed groups.

Table 3. Reproductive Performance of Dorset, Rambouillet and Dorset x Rambouillet Ewes Involved in a Twice-Yearly Lambing Program.

Breed group ¹	Season					
	Fall			Spring		
	D	D x R	R	D	D x R	R
No. ewe seasons ²	163	189	185	178	207	206
No. ewes lambing	60	74	54	132	178	185
% ewes lambing	37	39	29	74	85	89
No. ewes remated ²	48	65	46	82	96	70
% ewes remated	80	87	85	62	53	37
No. ewes lamb. rebred. conc.	34	56	44	36	46	31
% ewes lamb. rebred. conc.	56	77	81	26	25	16
Av. conc. date ⁴	Nov 21	Dec 7	Nov 25	May 31	June 2	May 23
Av. intv. lamb-1st matg.	32	32	33	52	63	65
Av. intv. lamb-conc.	44	46	41	63	68	66
No., lambs born	81	105	68	220	305	270
Lambing rate ³	1.35	1.41	1.25	1.66	1.71	1.45
No. lambs reared	56	86	60	194	280	252
% lambs reared	69	81	88	88	91	93

¹ D=Dorset, D x R=Dorset x Rambouillet, R=Rambouillet

² Number of records available for each season

³ Based on the ewes that lambed

⁴ Based on those ewes that lambed, rebred, and conceived

With respect to lamb production, the crossbred ewes produced more lambs per ewe lambing, 1.41, than the Dorset or Rambouillet ewes, 1.35 and 1.25 respectively. Rambouillet ewes raised a larger percentage (88 percent) of their lambs than did the crossbred (81 percent) and Dorset (69 percent) ewes; however, a larger number of lambs from crossbred ewes were actually born and reared.

The spring performance indicated that although a higher percentage of the Rambouillet ewes lambed, only 37 percent remated as compared to 62 percent of the Dorsets remating and 53 percent of the crossbred ewes remating. Of the ewes lambing, only 16 percent of the Rambouillets conceived post-partum; whereas, 26 percent of the Dorset ewes and 25 percent of the crossbred ewes conceived. Although these percentages are low for all three breeds, the latter two have an advantage over the Rambouillets. An examination of the intervals indicated that although Dorset ewes mated an average of 10 days earlier (52 vs. 63 days) than the other two breeds, the three breeds conceived at approximately the same time after lambing.

An examination of lamb production indicated the same trend as was seen in the fall. Crossbred ewes produced more lambs per ewe lambing, 1.71, than either Dorset ewes, 1.66, or Rambouillet ewes, 1.45, but were intermediate in the percentage of lambs raised. The crossbred ewes also raised more lambs (280) than either Rambouillet (252) or Dorset

ewes (1994). Table 4 presents combined lamb production over the two seasons. The 198 crossbred ewes produced 410 lambs or an average of 2.07 lambs per ewe; whereas, the Dorset ewes produced 1.77 lambs per ewe and the Rambouillet ewes produced 1.73 lambs per head. Although crossbred ewes tended to have an advantage in number of lambs produced, it is believed that none of the three breeds performed up to the potential of this management program.

Table 4. Lambing Rate Under a Twice-Yearly Lambing Program.

Breed group ¹	Spring	and Fall	Combined
	D	D x R	R
No. of ewes	170	198	195
No. of lambs born	301	410	338
Flock lambing rate ²	1.77	2.07	1.73

¹ D=Dorset, D x R=Dorset x Rambouillet, R=Rambouillet

² Lambs born per ewe in the flock per year within breed

The Association Between Potassium⁴⁰ Measurement and Measures of Leanness in Swine

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Story in Brief

Potassium⁴⁰ gamma radiation measurements were made in 1968 on fifty-three Yorkshire barrows representing five weight groups: 100, 150, 200, 250 and 300 pounds. Each pig was taken off feed and "counted" at each weight interval, irrespective of final slaughter weight, and was placed back on feed until it reached the predetermined slaughter weight. The pigs were slaughtered at their pre-determined slaughter weight immediately following live counting. The carcasses were counted and then cut into standard wholesale cuts; the right side was separated into lean, fat, and bone.

Correlation coefficients between first and second K⁴⁰ counts were determined on the live animals and the carcasses to determine how well counts taken at different times agreed. Correlations between first and second carcass K⁴⁰ counts were in closer agreement than those obtained

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