

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

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In any type of sheep enterprise where lambs are produced, the ewes need adequate and high quality feed during the last month of pregnancy for fetal development and also during the first two months after lambing for the production of milk. At other times of the year, the ewes are producing wool but otherwise are essentially being maintained, yet they still consume the equivalent of three pounds of air-dry feed daily. If these ewes could be made to lamb twice yearly or three times every two years, their efficiency would be greatly increased in terms of productivity per unit of feed consumed. Stockmen with a limited amount of feed could invest relatively more labor and management into such an enterprise and thus increase their productivity per acre and income per unit of capital investment.

Before such an enterprise can be properly evaluated, it is necessary to know what breeds or crosses would be most suitable for this type of program. Since twice-yearly lambing will involve at least one breeding season that is not normal for seasonal breeding ewes, those breeds and crosses that have been shown to exhibit the seasonal tendency least should be used in the initial studies. Ewes of Rambouillet and Dorset breeding are known to breed over a longer period of the year than other breeds. Previous information obtained from the Fort Reno Livestock Research Station indicates that Dorset x Rambouillet ewes conceive during May and June more readily than the Rambouillet ewes. Also, many observations suggest that many Dorset ewes will conceive during this period.

This is a preliminary report on a study being conducted at the Fort Reno Station to determine the genetic and environmental factors influencing twice-yearly parturition of Dorset, Rambouillet and Dorset x Rambouillet ewes.

Experimental Procedure

In the spring of 1964, a twice-yearly (fall and spring) lambing project was initiated at the Fort Reno Livestock Research Station in order to determine:

1. The performance of Dorset, Rambouillet and Dorset x Rambouillet crossbred ewes under twice a year lambing conditions when the breeding seasons center around May and November.
2. The average and variation in time from parturition to first estrus for the various breed groups and the two seasons involved.
3. The conception rates for the conditions listed under 2.

4. If the first year's performance will be maintained or improved during the second and third years of production as the ewes mature.
5. If breeding results are different when ewes are bred first for spring versus fall lambing.

Twenty 1963 spring-born, 1963 fall-born and 1964 spring-born ewes each of Dorset, Rambouillet and Dorset x Rambouillet (hereafter referred to as crossbred) breeding were obtained during 1963 and 1964. These ewes were obtained from flocks that customarily lamb their ewes both during the fall and late winter or early spring. All ewes were bred first when approximately one year of age, thus part of each breed group was bred first during the fall and the remainder during the spring. The following breeding, lambing and management procedures were and are practiced:

1. Fall breeding extends for 60 days beginning on October 20 and continues through December 19. Thus the spring lambing season begins about March 15 and extends until May 15.
2. Spring breeding also extends for 60 days beginning on April 20 and continues through June 19. This puts the fall lambing from about September 15 to November 15.
3. Ewes lambing more than 10 days before the next breeding season are exposed to a vasectomized teaser ram daily to detect estrus until the breeding season begins, after which they are exposed to a fertile ram. Later lambing ewes are exposed to a fertile ram approximately 10 days after lambing. Both marking harness and visual observation are employed to detect the ewes that are in heat.
4. All lambs are weaned at about 9-10 weeks of age in order that the ewes may recover sufficiently for their next parturition and lambing.
5. The ewes are weighed and scored for fat covering prior to each lambing season and at the end of each breeding season to aid in maintaining the ewes in a moderate condition relative to fatness.
6. The fall lambing ewes are supplemented with approximately one pound of grain per day plus alfalfa hay and are allowed to graze on wheat pasture together with their lambs.
7. The spring lambing ewes are also supplemented with about a pound of grain per day and permitted to graze on a bermuda-grass-alfalfa pasture combination. The ewes are let out to pasture twice daily since their lambs are not permitted to leave the lambing barn area. This practice is followed in an effort to reduce internal parasite infestation as much as possible in the spring-born lambs.

8. The ewes are shorn approximately one week before the spring lambing begins. Also, they are tagged and crutched about one week before the fall lambing starts.

Results and Discussion

This is a preliminary report. All of the objectives of the study have not been attained at this time. However, certain trends are apparent and this discussion will be confined to a comparison of these breed groups and related observations when the ewes are given the opportunity to lamb twice-yearly under natural conditions.

The information presented in Table 1 summarizes the performance of the three breed groups for the two fall seasons (1964-65) and the two spring seasons (1965-66).

Fall Performance

The data presented (Table 1) indicates that a higher percentage of the crossbred ewes lamb in the fall than either the Dorset or Rambouillet ewes. On the average, these crossbred ewes lamb about the same time as do the Dorsets; whereas, the Rambouillets lamb about a week later than the other two breed groups. An examination of the percentage of ewes that lambed, rebred and conceived indicates a slight advantage for the Rambouillets compared to the other two breed groups. All ewes that lambed, rebred and conceived had an average conception date that was very similar. An interesting point to note is that the Rambouillet

Table 1.—Preliminary Performance of Dorset, Rambouillet and Dorset x Rambouillet Ewes Involved in a Twice-Yearly Lambing Program.

Breed Group ¹	Season					
	Fall (1964-65)			Spring (1965-66)		
	D	DxR	R	D	DxR	R
No. Ewe Seasons ²	76	80	74	93	98	94
Av. Age of Ewes (mo.)	22	22	22	25	25	25
No. Ewes Lambing	33	45	32	72	81	84
% Ewes Lambing	43	56	43	77	83	89
Av. Lambing Date	Oct. 7	Oct. 9	Oct. 16	Apr. 4	Apr. 10	Apr. 6
No. Ewes Lamb., Rebred, Conc.	21	33	27	23	24	19
% Ewes Lamb., Rebred, Conc.	64	73	84	32	30	23
Av. Conc. Date ³	Nov. 20	Nov. 23	Nov. 22	May 27	May 30	May 12
Av. Int. Lamb. to Conc. ³	45	47	38	58	63	49
No. Lambs Born	42	58	37	108	128	107
Lambing Rate ⁴	1.27	1.29	1.16	1.50	1.58	1.27
No. Lambs Reared	29	45	31	97	119	100
% Lambs Reared	69	78	84	90	93	93

¹D = Dorset; DxR = Dorset x Rambouillet; R = Rambouillet.

²No. of records available for the fall and spring seasons.

³Based on the ewes that lambed, rebred and conceived.

⁴Lambs born per ewe lambing.

ewes had a shorter average interval (38 days) from lambing until the next conception occurred than either the Dorset (45 days) or the crossbred (47 days) ewes.

With regards to lamb production, the crossbred ewes were superior in number of lambs born as evidenced by their higher lambing rate. Further examination of the three breed groups reveals that the Rambouillet ewes reared a higher percentage (84 percent) of their lambs born followed by the crossbred (78 percent) and the Dorsets (69 percent). Even though the Rambouillets reared a higher percentage of their lambs, it is well to keep in mind that these ewes gave birth to fewer lambs than the other two breed groups.

Spring Performance

Table 1 indicates that approximately 12 percent more Rambouillet (89 percent) ewes lambed than did the Dorsets (77 percent); whereas, the crossbreds (83 percent) were intermediate between the two parental breeds. The average lambing date was similar for all breed groups. The percentage ewes that lambed, rebred and conceived was just the reverse of that indicated for the fall seasons. A higher percentage of the Dorsets (32 percent) lambed, rebred and conceived followed by the crossbred (30 percent) and Rambouillet (23 percent) ewes. It is worthy to mention that the figures are similar for all three breed groups, and based on these data should perhaps be interpreted as being quite similar. Of those ewes that lambed, rebred and conceived, the Rambouillet ewes had an average conception date 16 days earlier than the Dorsets or crossbreds. As was evident in the fall, the Rambouillet ewes had a shorter average interval (49 days) from lambing to conception followed by the Dorsets (58 days) and the crossbreds (63 days).

The crossbreds are superior, in the spring as they were in the fall, with respect to lamb production. The crossbred ewes that lambed produced about .16 of a lamb more per ewe than the Dorset or Rambouillet ewes. The percent lambs reared were similar for all breed groups, being slightly less for the Dorsets.

Discussion

Although certain trends are apparent with respect to the three breed groups, it is well to mention that none of the breed groups have performed very well under this type of management system. It was anticipated that the principal problem would be that of early resumption of estrual cycling and conception by the lactating ewes. All ewes must conceive 35 days post parturition if twice yearly lambing is to be accomplished and maintained without the lambing dates becoming later each season. It is evident from the information presented that the ewes have on the average not conceived with any degree of regularity 35 days after lambing.

Mortality for the three ewe breed groups has been slightly higher for the Dorsets. Seven Dorsets, four Rambouillet and two crossbred

ewes have died during the period covered by this report. Four of the Dorset ewes have died from complications arising as a result of a prolapsed uterus. Death losses among the crossbred and Rambouillet ewes can be attributed almost entirely to freak accidents (broken legs, etc.)

The information presented in Table 1 also indicates a difference in the survival rate of lambs born in the fall compared to those born in the spring. The combined performance of the three breed groups, within each season, indicates that the ewes reared approximately 77 percent of all lambs born in the fall and about 92 percent of the spring-born lambs. With these figures in mind, one might logically ask the question—why is there about a 15 percent advantage in survival rate for lambs born in the spring compared to those born in the fall?

Unfortunately, the answer to this question is not known but observations made on those lambs failing to survive during the fall suggests that low birth weights is associated with this high rate of mortality. During both fall lambing periods, several light weight lambs were born and the survival rate on these lambs has been rather low.

Figure 1 illustrates two types of lambs (with respect to birth weight) born during the fall. The small lamb is typical of the light weight lambs and the larger lamb is considered to be typical of those having a normal birth weight. The large lamb weighed 10.3 lb. at birth; whereas, the small lamb weighed 2.1 lb. In most all cases, these light weight fall-born lambs have been extremely small at birth but otherwise appear to be normally developed. Many of these small lambs are alive at birth but usually die within a few hours.

The light weight lambs are susceptible to the elements of nature and their chances for survival are greatly reduced. The larger more vigorous lambs at birth are those whose chances of survival are greatest and respond more favorably to an optimum environment throughout their growth period. These lambs are better able to utilize their dam's milk and make more rapid growth during the preweaning period.

A comparison of the birth weights of all lambs born in the fall (6.1 lbs.) with those born in the spring (9.2 lbs.) indicates about a 3 lb. advantage in birth weight for the spring-born lambs. Of the 343 spring-born lambs, 27 failed to survive. Those that did not survive had an average birth weight of 7.6 lbs. compared to 9.3 lbs. for the remaining lambs. A more extreme picture is evident after examining the birth weights of all fall-born lambs. The surviving lambs had an average birth weight of 6.8 lbs.; whereas, the 32 lambs failing to survive had an average birth weight of 3.7 lbs. A comparison of the average birth weights for fall-born lambs suggests that low birth weights very likely is a contributing factor to this high mortality observed.

No definite explanation can be given for these light weight fall-born lambs. However, some speculation into this matter appears to be in order. It is believed that high environmental temperature has some influence on the birth weight of these lambs, but just how this elevated



Figure 1. Comparative size at birth of two fall-born lambs. The large lamb weighed 10.3 lbs. at birth; whereas, the small lamb weighed 2.1 lbs. Most of these small, underdeveloped lambs are born during the first two weeks of the lambing season (last two weeks of September). Note the vigor of the large lamb.

temperature operates on an unborn fetus is not known. Where the ewes are maintained on pasture, as they are in this study, high environmental temperatures could perhaps bring about a reduced forage intake, which in turn may have an effect on the fetal growth. This condition should be repeatable by limited feeding if this explanation is correct. Such attempts have not given these results. Also the ewes should not be fat at lambing time. These ewes were fat.

As the environmental temperature increases, there may be an increased peripheral blood circulation as a means of eliminating the increased body heat. This in turn could create a nutritional deficiency to the fetus due to a reduced blood flow to the uterus. This explanation seems more plausible, but it may not be correct.

The ewes involved in this study are mated for fall lambing beginning on April 20 and continues through June 19. Consequently, the ewes that become pregnant are exposed to the hot months of July and August during much of their gestation period. This would be especially true for the ewes that conceive early in the breeding season. An interesting point to note is that of the fall-born lambs failing to survive, 56 percent were born during the first week and 62 percent during the first two weeks of the lambing season.

Summary

Twenty 1963 spring-born, 1963 fall-born and 1964 spring-born ewes each of Dorset, Rambouillet and Dorset x Rambouillet breeding were obtained during 1963 and 1964 to determine the performance of these three breed groups under twice a year lambing conditions when the breeding seasons center around May and November. All ewes were bred first when approximately one year of age, thus part of each breed group was bred first during the fall and the remainder during the spring.

Only preliminary conclusions can be drawn at the present time. In general the performance of the three breed groups had been superior in the spring to that in the fall. A higher percentage of all ewes lambed in the spring, gave birth to more lambs and reared a greater percent of the total lambs born. However, the percentage of ewes that lambed, re-bred and conceived has been considerably lower in the spring than for the fall. This is to be expected since the normal breeding season occurs during the fall and consequently more of the ewes should lamb in the spring.

With respect to the individual breed groups, a higher percentage of the crossbred ewes have lambed in the fall; whereas, about an equal number of crossbred and Rambouillet ewes have lambed in the spring. The percent ewes that lambed, rebred and conceived has been in favor of the Rambouillets during the fall and similar for all breed groups in the spring. The Rambouillet ewes have consistently had a shorter average interval from lambing to conception followed by the Dorsets. The crossbred ewes require a longer interval from lambing until conception, but they have been superior to the Dorsets and Rambouillets in the number of lambs produced per ewe lambing. The Rambouillet ewes have produced less lambs per ewe lambing, both during the fall and spring seasons.

Neither of the three breed groups has performed in what might be considered as an optimum manner under this type of management system.

There appears to be about a 15 percent advantage in survival rate for the spring-born over the fall-born lambs. A comparison of the average birth weights of fall and spring-born lambs suggests that low birth weights is probably a contributing factor to this high mortality rate observed among fall-born lambs.

Studies will be continued with the original ewes until it is decided that a normal level of performance has been reached without any artificial treatments being imposed. Once this co-called normal performance is established and if this proves to be unsatisfactory, then it may be necessary to employ the use of certain hormones to induce estrus and ovulation in the lactating ewes.