

1964 FEEDING AND BREEDING TEST

Continuous vs. Night Breeding in Producing Fall Born Lambs

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For many years it has been suggested that the breeding efficiency of flocks of ewes might be improved if rams were turned with the ewes only during the night. Thus, during the day the rams could be given extra feed while the ewes were on pasture. Further, rams are not thought to be quite as fertile nor as aggressive in May and June as during the fall months. In earlier work involving cooling rams during the heat of the day, it was observed that the cooled rams were more comfortable and rested quietly during the day as compared to noncooled rams that tended to be restless. The cooled rams were more aggressive and more efficient breeders.

The authors know of no experiment specifically designed to determine if night breeding is more efficient than continuous breeding. This paper summarizes such a test that has been under way at the Ft. Reno Livestock Research Station during the past four years.

MATERIALS AND METHODS

The study involved 550 ewes and 18 rams. The basic design was a paired arrangement wherein a group of ewes was equally divided into two similar pastures. A pair of similar rams were randomly assigned one to each pasture. One of each pair of rams (chosen at random) was left with his assigned group of ewes continuously throughout the 40-day breeding season. The other ram was removed from his pasture each morning and spent the day (about 8:00 a.m. to 5:00 p.m.) in a lot with feed, water and a shade available. The trial involved nine such pairs of rams and paired groups of ewes as shown in table 1.

The ewes were equally divided on the basis of breed, age and the past years performance (reared 0, 1 or 2 lambs). The number of ewes per group varied by no more than one ewe within pairs but varied from 21 to 35 between pairs. Rams of a pair were of the same age, breeding (usually half brothers), type and in similar condition. Different pairs

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Table 1. The composition of the breeding groups used during the 1960-1963 seasons.

Year	Pair	Night Only		Continuous	
		Ram (Ident.)	No. of ewes	Ram (Ident.)	No. of ewes
1960	1	30	32	28	32
	2	27	31	29	32
1961	3	32	35	35	35
	4	34	34	33	35
1962	5	46	23	45	23
	6	44	22	47	21
	7	32	33	34	33
1963	8	50	32	49	33
	9	51	32	52	32

of rams were Dorsets, Suffolks or Hampshires and were from one to three years of age. Rams were fitted with marking harnesses and each morning the ewes were examined. Those ewes with fresh marks were recorded as mated.*

The breeding season started each year on the 20th, 21st, or 22nd of May and continued for 40 days. The ewes were left out in the pastures for the entire breeding season. The two groups of ewes that made up a pair were always treated in the same manner so that in their mating and subsequent lambing performance they should have responded alike. Any difference in breeding efficiency between the groups that made up a pair should have been due to the treatment imposed on the assigned ram or due to chance.

If the treatment imposed on the rams had no influence on the breeding efficiency of the groups, the mean performance of all groups bred at night only should be about the same as the mean performance of all groups bred continuously. Also, if one considered which ram treatment performed best within each pair, each treatment would appear better about half of the time if the treatments had equal influences on breeding performance.

RESULTS

An examination of the first two columns of table 2 reveals that relative to the percent of ewes lambing there was little if any treatment effect. In 5 pairs out of 9 more ewes lambed from night breeding only and in the other 4 pairs more ewes lambed from continuous mating. The overall average difference in percent ewes lambing was 2 percent in

* Mating records obtained in this manner are not perfect. Some ewes are mated and not marked and other ewes are marked but not mated.

favor of night breeding. These are the kinds of results that one obtains when there are small or no differences due to the treatments imposed.

The third and fourth columns of table 2 give the lambing rate of the ewes that lambed. This characteristic appears to have been influenced by the treatments. In 7 pairs out of the 9 the ewes that mated only at night had more twins. In one pair the twinning rate was the same and in only one pair of the nine did more twins result from continuous mating. Overall, 40 percent of the ewes that mated at night only had twins as compared to 26 percent for the continuously mated ewes. Such results as these would occur rarely due to chance and we would, therefore, conclude that somehow the night breeding treatment caused more twins to be born.

The last two columns of table 2 show the ratio of lambs born per ewe in the breeding flock or if each quantity is multiplied by 100, the percent lamb crop. This, of course, is an overall measure of reproductive performance combining the figures for ewes lambing (columns one and two) and lambing rate (columns three and four). The advantage shown in columns five and six for the night breeding treatment is a reflection of the higher twinning rate previously discussed.

DISCUSSION

It is not normally thought that the ram, provided he is fertile, has much, if any, influence relative to whether a ewe has twins or a single lamb. The number of eggs ovulated by the ewe basically determines the maximum number of embryos that can develop. The ram furnishes millions of sperm, only one of which is necessary to fertilize each egg.

Table 2. The reproductive performance of rams used at night only vs. continuous use (presented by pairs.)

Pair	% ewes lambing		Lambing rate ¹		Lamb/ewe ratio ²	
	Night	Continuous	Night	Continuous	Night	Continuous
1	81	91	1.38	1.38	.12	.125
2	94	88	1.45	1.39	1.35	1.22
3	89	77	1.39	1.37	1.23	1.06
4	76	77	1.58	1.30	1.21	1.00
5	78	65	1.11	1.13	.87	.74
6	82	95	1.22	1.00	1.00	.95
7	88	82	1.31	1.15	1.15	.94
8	100	91	1.50	1.30	1.50	1.18
9	81	94	1.50	1.13	1.22	1.06
Av.	86	84	1.40	1.26	1.20	1.06

¹ Average number of lambs born per ewe lambing.

² Average number of lambs born per ewe in the breeding flock.

These results suggest that the ram may influence (by some unknown mechanism) the number of eggs that are ovulated by the ewe or that there is a differential rate of fertilization of the eggs or of embryo survival. Fertilization rate or embryo survival differences should be reflected in the number of ewes lambing. Either a higher fertilization rate or a higher embryo survival should result in more ewes lambing. The small difference found in this study does not suggest that this is a valid explanation.

In an attempt to determine what influence the rams might have had on other characteristics associated with breeding and subsequent lambing, the records were studied in more detail. Several studies have been conducted by other workers to determine if teaser rams used prior to the breeding season will influence the breeding performance during the breeding season. Many of these trials have yielded inconclusive results but in some instances a modification of the usual breeding pattern has been suggested. Thus, the presence of a ram may alter the breeding pattern of ewes under some conditions. Rams that can rest during the day may be more aggressive while with the ewes at night and thus cause different breeding patterns as compared to rams used continuously. Such an alteration might be reflected in the average date of breeding. The nature of this data is such that breeding dates are not as accurate for all ewes as are lambing dates.

The first two columns of table 3 show the average lambing dates (day of year) for the various breeding groups. Although the difference is only two days with the night bred ewes lambing earlier, the difference is probably real and not due to chance. In 8 of the 9 pairs the night bred ewes lambed earlier. If this is real, it suggests that the rams involved influenced the breeding date.

Table 3. The reproductive performance of rams used at night only vs. continuous use (presented by pairs.)

Pair	Av. lambing date ¹		s lambing date ²		First Sv. concep. ³	
	Night da.	Cont. da.	Night da.	Cont. da.	Night %	Cont. %
1	304.1	305.5	9.9	7.7	73	59
2	304.5	306.4	8.6	8.1	81	80
3	306.0	308.5	7.9	7.2	68	74
4	302.0	303.6	7.1	7.8	70	85
5	307.6	312.7	6.7	6.3	50	43
6	307.9	309.3	8.4	6.8	67	45
7	306.1	305.8	7.6	8.4	58	53
8	302.8	303.2	7.2	7.8	94	78
9	299.1	302.6	6.6	5.6	87	81
Av.	304	306	7.8	7.4	73	68

¹ Day of the year.

² s is a measure of variation. Smaller values indicate more uniformity.

³ Percent of the ewes conceiving during their first recorded estrus (heat).

The middle two columns of table 3 show the variability in lambing date for the groups. (s is a mathematical symbol for a measure of variation. The smaller the value the more uniform the characteristic measured.) The night bred ewes were more variable (overall) for lambing date but this may have been due to chance. In 6 pairs the night bred ewes were more variable and in 3 pairs the continuous bred ewes were more variable.

The last two columns give the first service conception rate (percent of ewes settling during their first recorded estrus) for the various groups. In 7 of 9 pairs the night bred ewes exhibited a higher conception rate. Such results would occur less than one time in fifty due to chance if there were truly no treatment effect. Therefore, the night breeding treatment probably results in a higher first service conception than does continuous breeding under conditions similar to these. Such results would be expected if the higher twinning rate shown in table 2 resulted from a higher ovulation rate for the night bred ewes. If other factors are equal, a higher ovulation rate automatically leads to higher conception rate.

The higher first service conception rate should have led to an earlier average lambing date. If a higher percentage of the ewes in a group conceive at their first estrus, this will automatically cause the group to have an earlier average lambing date than a group where more of the ewes conceive at a second or later estrus as did the continuously bred ewes in these trials. The records (such as they are) indicate that there was essentially no difference between the treatment groups in the first mating date.

The higher conception rate at first estrus should have led to a higher percent of the ewes lambing among the night breeding ewes if all ewes were in a proper physiological condition to conceive. There was essentially no difference in percent ewes lambing because more continuous bred ewes conceived to later services. It may be that there were about equal numbers of ewes in each treatment group that were not in a proper physiological condition to conceive and the imposed treatment had no beneficial effect on these conditions.

The mating records of the ewes not lambing were studied. There were 82 ewes of the 550 that did not lamb. This included 39 night mated and 43 continuously mated ewes. These ewes that mated but did not lamb had a later average first mating date than did the ewes that conceived and lambed. Ten ewes of the night mated group and 11 of the continuously mated ewes did not show any matings. There was nothing in the records to explain why these ewes did not mate and/or lamb.

SUMMARY

A trial has been conducted during the 1960-63 May-June breeding seasons to determine if mating at night only results in any improvement in breeding efficiency as compared to continuous mating. A total of 550 ewes and 18 rams were involved in a paired design involving 9 pairs of rams and 9 paired pasture mating groups.

There was little difference in the percent of the ewes lambing. The ewes that were mated at night only lambed two days earlier and produced more twins than the ewes that were mated continuously. It is believed that resting the rams during the day caused them to be more aggressive while they were with the ewes. The increased twinning of ewes bred to rested rams could have resulted from a higher ovulation rate by the ewes or a higher fertilization and/or embryo survival rate. The data is not adequate to determine which explanation is correct, but irrespective of how it happens, the evidence is very conclusive that resting rams during the day is a beneficial practice when the breeding season is during late May and June.

Effect of Feed Level Before and After Calving on The Performance of Two-Year-Old Heifers

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The vital importance of properly developing the beef heifer intended to be a replacement in the herd has long been recognized. However, considerable differences of opinion still exist among producers in regard to the best nutritional level for this development. Extremes in levels used have ranged from the creep-fed heifer that is placed on full feed following weaning, to the poorly mothered, non-creep fed heifer that is provided a mere survival ration following weaning.

A number of experiments have been conducted at several experiment stations to study the effect of nutrition on the development and subsequent performance of beef heifers. While many of these studies are still in progress, the evidence that has been obtained shows fairly conclusively that either extreme is undesirable. Extremely high levels reduce the life span and impair the milking ability of the beef female as well as being excessively costly. Extremely low levels results in poor reproductive performance, poor milking and light weaning weights.