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THE BREEDING BEHAVIOUR OF TWO-TOOTH EWES

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IN STUDIES OF FERTILITY in the Romney, much emphasis has been laid on the lower level of reproduction of the two-tooth. In the field it has been observed that well-reared hoggets are more fertile as two-tooths than poorly reared ones, that there are breed differences in two-tooth fertility, and that, under certain conditions, woolly faced two-tooths are less fertile than open faced two-tooths. In physiological studies, it has been shown that two-tooth ewes have more irregular oestrous cycles than mature ewes, that oestrus is shorter, and that their implantation rate is lower.

The results of two experiments (1), (2), suggest that two-tooth ewes, normal in all other respects, are not mated because of certain characteristics of their breeding behaviour.

In 1952, at Massey College, an experiment was initiated in which several phases of reproduction in Romney and Romney-Cheviot halfbred ewes were compared. Sixty two-tooth ewes of each breed were run together with raddled vasectomized rams from February 20 until May 30. The ewes were examined daily until the first ewe was marked by the teaser, and thereafter examinations were made at eight-hour intervals.

At each observation period, the whole flock was yarded and any ewes marked in the preceding eight hours were removed from the main flock. These ewes, together with any others in oestrus at the previous observation period, were then tested for oestrus with a teaser in a small yard. This procedure was followed primarily to determine the duration of oestrus and the length of the oestrus cycle, but at the same time the intensity of heat or the willingness of the ewe to accept service from the ram was recorded.

At each observation, intensity of oestrus was graded into one of the following:

High Grade: The ewe would urinate when the ram entered the pen and generally remain still as it approached her. Occasionally a ewe would approach the ram. The teasing process was short and the ewe would stand still and accept service readily.

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Medium Grade: The ewe would urinate when the ram entered, and generally move away a few yards as it approached. The ewe would be restless during the teasing process and often move a step or two when the ram attempted to mount. However, such ewes showed considerable interest in the ram.

Low Grade: The ewe would urinate when the ram entered and then move rapidly round the pen when he approached. Prolonged teasing and several attempts at mounting were required before the ewe would accept service. Frequently it was necessary to try several rams before ewes with oestrus of this intensity grade could be persuaded to stand.

The first obvious breed differences which this experiment revealed were in the proportion of ewes showing oestrus, and in the distribution of the times of first oestrus. All the half-breds experienced their first oestrus within a period of six weeks, while in the Romneys only 90 per cent. of the ewes experienced oestrus over a period of fifteen weeks.

Altogether, 1,290 observations were made on the intensity of oestrus and the lengths of 321 oestrous periods were measured. There was a significant difference between breeds in the duration of oestrus, the mean duration of the Romneys being 20.4 hours (with 27 per cent. of the periods of 8 hours and under) and that of the halfbreds 28.0 hours (with only 10 per cent. of the periods of 8 hours or less). Significant differences in the peak intensity of oestrus and the level of intensity throughout an oestrous period were also revealed. At least one high intensity rating occurred in 79.5 per cent. of the halfbred oestrous periods and in only 68.3 per cent. of those of the Romneys. There was also a significantly greater proportion of halfbred oestrous periods which began with a high-intensity rating.

The measurements made in this experiment will considerably over-estimate the situation in the field. At eight-hour intervals, the entire flock was yarded for about half an hour and during testing the ewes were confined in a pen of 10 by 4 yd. and a squad of rested, enthusiastic teasers was available to test them.

Estimates of the duration of oestrus in the field under fairly intensive conditions have been made by Lambourne (3). His limited data showed that, on average, two-tooth ewes would accept service for only 3.3 hours with a range of 1 to 6 hours, while for mature ewes the mean period was 15 hours with a range of 2 to 23 hours. Even if these figures underestimate the average situation, they do suggest that, under hill country conditions, ewes with short oestrous periods and those with heats of low intensity have reduced chances of meeting a ram and being served by it at the optimum time for conception.

During the three seasons, 1954-56, an experiment was carried out at Ruakura to test whether the management of ewes at mating had any effect on lambing performance. The treatments were as contrasting as they could be made under the conditions at the hill station and were designed, on the one hand, to promote the frequent intermingling of ewes and rams, and on the other, to promote undisturbed dispersal of the flock. The two treatments were as follows:

Intensive Flock: This flock was run in small paddocks (25 to 49 acres) of fairly easy contour and each day during tupping was mustered and held in a corner for about ten minutes.

Extensive Flock: This flock was run in a paddock of 105 acres which was rough and divided by deep gullies with few crossings. Except for two musters when the rams were interchanged with those of the intensive flock, the ewes and rams were left completely undisturbed.

Ewes from a mixed age flock of Romney ewes were allotted at random to each treatment. Each flock had the same number of rams (2½ to 3 per cent.) and the rams were interchanged between flocks twice during the mating season. As soon as the rams were withdrawn (after 10½ weeks), the two flocks were combined and wintered and lambed as one group.

Analyses were made on the time pattern of lambing in each flock and on the percentages of ewes which failed to lamb.

Table 1 shows the three-year averages of the percentage of ewes lambing and the average date of lambing in the two flocks.

TABLE 1: EFFECT OF TUPPING MANAGEMENT ON LAMBING.
(Seasons 1954-56)

	Two-tooths		Mature Ewes	
	Intensive	Extensive	Intensive	Extensive
No. of ewes mated	151	132	242	245
Ewes dry (percentage)	26.5	43.9	19.0	15.5
Mean date of lambing	Sept. 9	Sept. 14	Sept. 6	Sept. 10

The intensive treatment greatly increased the percentage of two-tooth ewes which had lambs and the difference was of about the same order in each of the three seasons. The treatment had no significant effect on the lambing rate of the mature ewes, however. This finding suggests that the breeding behaviour of mature ewes is such that they will be successfully served by the ram irrespective of the size and topography of the paddock in which they are tupped.

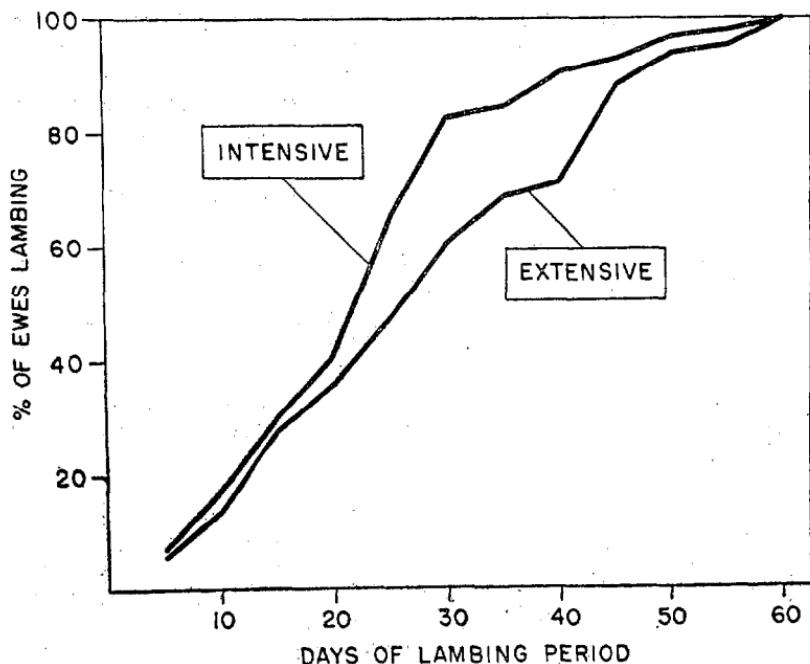


Fig. 1: A comparison of the effects of intensive and extensive tupping management on lambing.

The difference between treatments in mean date of lambing was significant for both age groups of ewes, but the age-treatment interaction approached significance.

Figure 1 shows the pattern of lambing in the two-tooths. While lambing continued for the same period in both flocks, it was concentrated earlier in the intensive flock. Thus, it appears that the intensive treatment had an effect on all age groups in enabling the ewes of that flock to meet the ram earlier than the ewes of the extensive flock.

These extreme treatments at mating had a profound effect on the lambing percentage of two-tooths but not mature ewes, presumably because of the differences in their breeding behaviour. The design confounded the effects of several factors, however, and the differences could have been produced by one or more of the following agents acting singly or together:

Paddock Effects: Was the difference between the lambing rates of the two flocks a reflection of the size of the paddocks in which they were mated (that is, an effect of sheep concentration) or was the topography of the paddocks the more important feature?

Mustering Effects: Was the difference produced a result of the daily mobbing of the flock, or of the fact that the sheep were held together each day for ten minutes in a concentrated mob? If mustering is important, how frequently should it be performed, and at what time of the day is it most efficient?

Other questions which are worthy of investigation are these:

- (a) Are two-tooths better tupped on their own or in association with mature ewes?
- (b) Would some form of pre-treatment, such as running teasers with ewe hoggets, have any effect on their breeding behaviour as two-tooths?
- (c) Would higher ratios of rams to ewes produce better results and would young vigorous rams cover the ewes better than older rams.

Conclusions

At least part of the difference between two-tooths and mature ewes in reproductive efficiency may result from differences in breeding behaviour. It has been demonstrated that management methods at mating which increase the chances of ewes with short, weak oestrus periods being served by the ram can lead to improved fertility. Further improvements in two-tooth fertility might be expected from nutritional or hormonal treatment which increase the intensity and duration of oestrus.

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References

- (1) INKSTER I. J. (1953): M. Agr. Sc. Thesis. Massey Agric. College.
- (2) ————— (1956): *Proc. Ruakura Farmers' Conf.*, p.20.
- (3) LAMBOURNE L. J. (1956): *Proc. Ruakura Farmers' Conf.*, p.16.

DISCUSSION

Q.: *Have you made any observations on the effect of time of shearing in relation to tupping and the subsequent breeding behaviour of the ewes?*

A.: Last year a group of two-tooth ewes was shorn before tupping. These ewes had a lower lambing percentage than the controls which were shorn in the previous October. However, the groups were small, and more work is required.

DR. D. G. EDGAR.: Concerning the treatment of ewes to increase the intensity of oestrus, I carried out one small experiment in which a group of ewes were treated to bring them in oestrus and to ovulate during an oestrus. I found, in fact, that only a proportion of these ewes actually

came into oestrus. In an attempt to increase this proportion, small injections of oestrogens were administered. None of the ewes treated in this way actually came in heat.

Q: : I would like to ask two questions. First, could the higher conception rate of the group which was mustered be accounted for by the matings which took place during the ten minutes they were held in a corner, or do most of the matings take place afterwards? Secondly, what is the reason for so many dry ewes in mature sheep?

A: : There was no way of measuring which was the more important factor. I think that the chief function of mustering was the establishment of liaison between rams and ewes in season. I cannot explain why there were so many dry mature ewes.

Q: : Have you noticed any tendency for ewes which are shy breeders in one year to continue to be difficult to get in lamb in subsequent years?

A: : Not from this experiment. Mr. Clarke may care to comment on the information he has available from the Hill Station.

E. A. CLARKE: : From a mob of fifteen hundred ewes, 30 failed to produce a lamb in two consecutive seasons. When these were mated in small paddocks, 80 per cent. of them were successfully mated. Of the remaining 20 per cent., most of these had some defect which made them permanently infertile.

MR. MCFARLANE: : Mr. Inkster has been investigating one of the most important problems of our sheep-breeding country and from the work he has done he has produced one of the most effective answers to this problem. We have been able to confirm Mr. Inkster's findings by running the two-tooths separately from the main mob and tupping them in paddocks round the homestead. We have obtained a much improved lambing performance by adopting this practice. I would like Ruakura workers to continue this type of work with rams, to give us the type of information we require to weed out the inefficient ram. Concerning the percentage of dry sheep, I find there is a big variation between properties. About 90 per cent. of two-tooth ewes which rear a lamb get in lamb again the following year.