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OESTROUS ACTIVITY AND LAMB PRODUCTION OF THE N.Z. ROMNEY EWE

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AN EXPERIMENT which examined the effects of farms, age of ewe and time of mating on patterns of oestrous activity, variation in "returns" to mating, incidence of barren ewes and lamb production was described. The experiment was of an exploratory nature and forms part of an overall programme aimed at investigating the reproductive performance of the New Zealand Romney ewe.

On each of 5 farms situated at 0, 500, 1,000, 1,500 and 2,000 ft above sea level, in the Rangitikei district of the North Island, 720 ewes (equal age-groups, 1½-4½ yr) were studied. Separate groups of 80 ewes (20/age group) on each of the 5 farms were joined with harnessed, semen-tested rams for 9 consecutive 17-day periods from January 18 to June 19, 1968. Each group of 80 ewes was inspected for fresh matings on Days 8 and 17 of each observation period. At the conclusion of each 17-day period, these ewes were withdrawn and a further group of 80 introduced. The lambing information was recorded.

The patterns of oestrus followed that of a sigmoid curve and probit values of the proportion of ewes which exhibited oestrus in each farm-age-time cell were taken. Analysis of the estimated times when 50% of the ewes in any one farm-age group were exhibiting oestrus showed significant differences between farms. The first ewes exhibited oestrus on Farms 1, 2 and 3 (situated at 0, 500 and 1,000 ft) between February 12 and 29, and on Farms 4 and 5 (at 1,500 and 2,000 ft) between February 29 and March 9. Maximum oestrous responses (95% plus of the ewes available) were first observed on Farms 1, 2 and 3 between March 26 and April 4 and on Farms 4 and 5, between April 4 and 12. The proportions of 1½-yr-old ewes which exhibited oestrus were consistently lower than the other age groups. Considerable variation in activity was noted from the time when maximum oestrous responses occurred until June.

The data on reproductive performance provided some basic information on the dynamics of reproduction in the

ewe; these were mainly related to changes attributable to the time of mating. The findings can be summarized as:

- (1) Of the ewes mated, 10.6% returned to service within a normal cycle length of their initial mating. Analyses of these data showed a significant linear decrease in the incidence of ewes which returned to service with time of mating.
- (2) A total of 2.5% of the ewes mated returned to service beyond a normal cycle length. There were no significant differences between the times of mating, farms or ages of ewes in their incidence.
- (3) Of the ewes which had apparently conceived to a single mating (which did not return to service) 6.5% failed to lamb. A significantly greater number of those ewes mated near the end of the breeding season were barren when compared with those mated earlier.
- (4) A total of 118.4% of lambs were born to the ewes which lambed. Analyses showed a linear decrease in the total lamb production relative to the time of mating. This decreased from 140% (from those ewes mated late February-early March) to 109.7% (from those ewes mated in June). The percentage of total lambs born to each age group of ewes was: 1½ yr — 107.7; 2½ yr — 116.5; 3½ yr — 123.3; 4½ yr — 124.7.

Because of the larger numbers of ewes which returned to service following matings at the beginning of the breeding season, there was a significant linear increase in the number of total lambs born to the ewes actually mated.

Overall, the percentage of lambs alive to the ewes mated was 83.5, and to those lambing 103.2. Of the lambs born, 12.8% died within 3 days of birth. Significantly more lambs died from those ewes which were mated earlier in the breeding season than from those mated later.

These results suggest that a period of maximum reproductive efficiency exists within the breeding season. This is characterized by a maximum oestrous response, a minimum return rate to service and incidence of barren ewes, a higher total lamb drop, and a period of minimum lamb loss. The data showed that this period lies between the end of March and the beginning of May.

The data will be published in full elsewhere.