# THE MILK PRODUCTION OF MERINO EWES FROM FLOCKS SELECTED FOR HIGH AND LOW WEANING WEIGHT

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## I. INTRODUCTION

The milk production of Merino ewes, under a variety of grazing conditions, has been studied by Davies (1963). As with other breeds, nutritional status and fecundity had important effects on milk production. Barnicoat, Logan and Grant (1949) found much individual variation in the milk production of Romney ewes after all known environmental effects had been accounted for and they suggested that genetic variation was important. Slen, Clark and Hironaka (1963) observed breed differences in milk production; but no comparisons have been published of the milk production of different strains of the one breed.

This report presents observations made on the secretion rate and chemical composition of the milk of Merino ewes from an unselected genetic control flock and two flocks which have been selected for high and low body weight of lambs at weaning.

TABLE I

***Average daily milk production*** of ***the ewes*** for ***each flock, during the ten week period.***

| Flock | | Milk Production (kg/day) | |
|---|---|---|---|
| Ewes | Rams† | Mean | S.E. |
| W+ | W+ | 1.96 | 0.12 |
| | W— | 2.12 | 0.20 |
| R | R | 1.85 | 0.08 |
| W— | W+ | 1.66 | 0.12 |
| | W— | 1.67 | 0.10 |

W+ .... .... Selected for high weaning weight
R .... .... Random flock
W— .... .... Selected for low weaning weight

† Rams to which ewes were mated in the current season.

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## II. MATERIALS AND METHODS

The ewes were drawn from the three flocks described by Pattie ( 1964). In March 1963 some reciprocal matings were made between the high and low weaning weight flocks, as well as normal matings within the flocks. The milk production of 30 ewes, 10 from the control and 5 from each sub-group of reciprocally or normally mated ewes was studied during Spring 1963. The ewes, aged between three and seven years, lambed between August 1 and August 27; all reared twin lambs. The ewes from each flock were balanced for age and date of lambing.

The milk secreted during a four hour period was measured once each week for ten weeks, using the oxytocin method of McCance (1959). At each collection, individual samples of milk were taken for analysis. Percent fat was

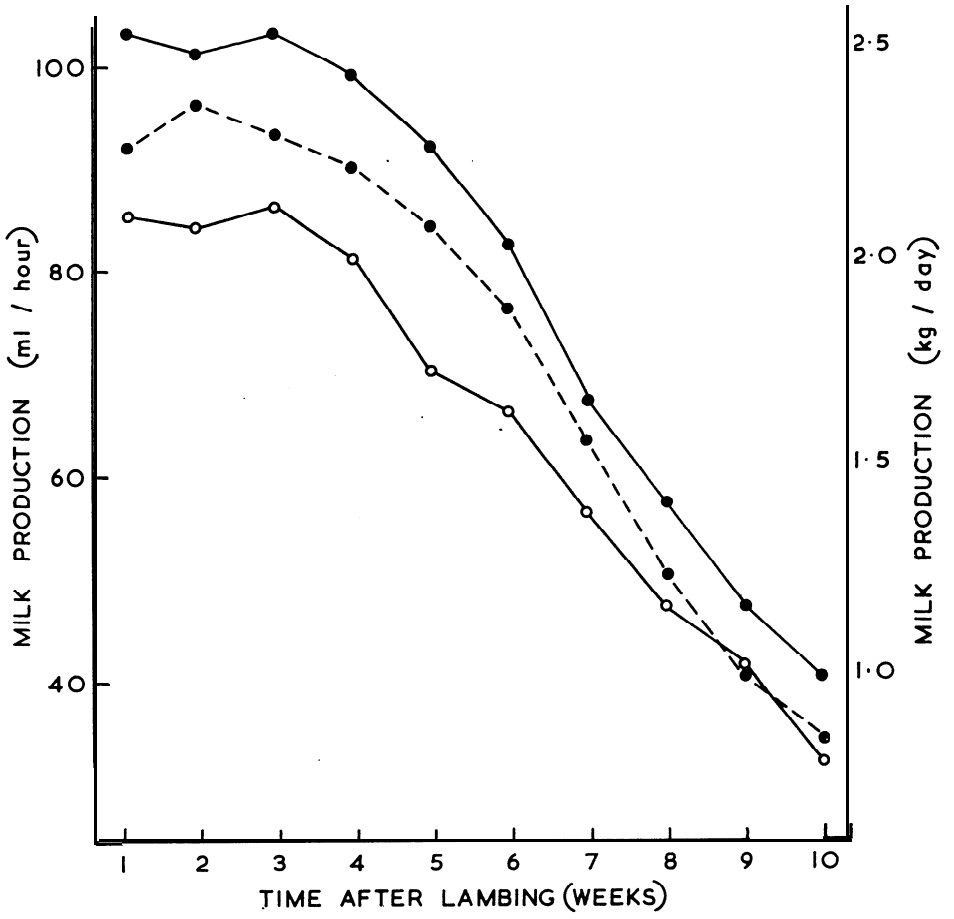


Fig. 1.—Mean lactation curves of twin-bearing ewes from flocks selected for high weaning weight (●———●), low weaning weight (o———o), and from a random control flock (●– – –●).

determined by the Babcock method, percent solids-not-fat by evaporation and percent protein by the dye-binding method of Vanderzant and Tennison (1961).

## III. RESULTS AND DISCUSSION

Table 1 gives the average daily milk production, over the ten week period, of the ewes in each sub-group. As there were no significant differences in milk production between normally and reciprocally mated ewes within each flock the results from these ewes were pooled for comparisons between the selection flocks.

Over the ten weeks of lactation, ewes from the flock selected for high weaning weight produced 10% more milk than ewes from the random flock. These in turn produced 10% more milk than did ewes from the flock selected for low weaning weight (Figure 1). Analysis of variance showed that these differences were significant ($P<0.05$).

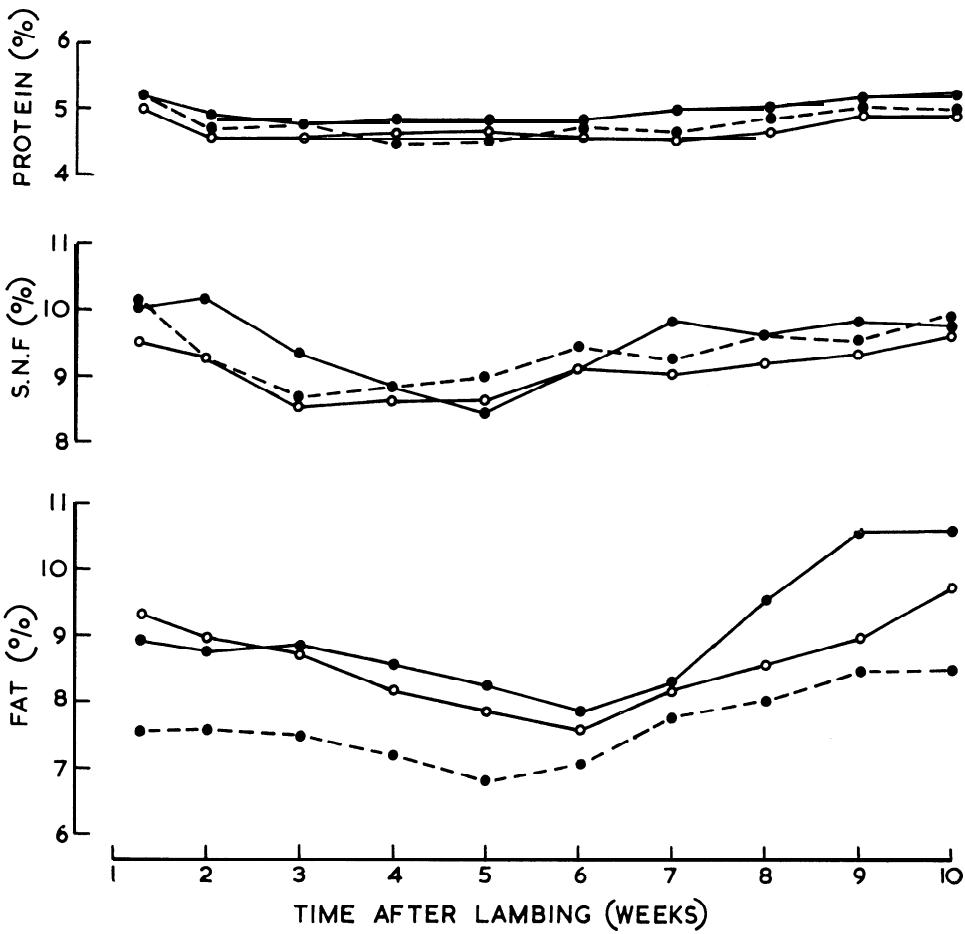


Fig. 2.—Mean percentages of fat, solids-not-fat (S.N.F.) and protein in the milk of ewes from flocks selected for high weaning weight (●———●), low weaning weight (o———o), and from a random control flock (●– – –●).

The average production levels for each flock were higher than those previously reported for Merinos, British breeds and their crosses (Davies 1963, Slen et al 1963), but the differences are confounded by the effects of nutrition, technique of measurement and number of lambs reared.

Mean percentages of fat, protein and solids-not-fat for each flock are given in Figure 2. There were no significant differences in milk composition between any of the flocks.

Barnicoat et *al* (1949), Coombe et *al* ( 1960) and others have published correlations between lamb growth and milk production, which are phenotypic correlations and give no information on the response of milk production to selection for lamb growth. However the present results show that there is a genetic correlation between weaning weight and milk production and that selection for high weaning weight will automatically increase milk production, without reducing the nutritive value of the milk.

## IV. ACKNOWLEDGMENTS

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