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# LIVE WEIGHT AND OVULATION RATE IN YOUNG MAIDEN EWES

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*Summary*

The relationship between live weight and ovulation rate was investigated in 955 young maiden Merino and Merino-Corriedale ewes. The relationship between live weight and ovulation rate differed between breed and season of observation. In general the ovulation rate rose steadily from 1.00 at a live weight of 27 kg to a maximum of 1.23 at 50 kg. Comparisons between young and mature ewes in terms of the live weight and ovulation rate relationship are discussed.

## I. INTRODUCTION

The relationship between live weight and ovulation rate in young maiden ewes is not well documented. Numerous studies of mature ewes have shown that ewes with a higher live weight produce more ova than lighter ewes (Wallace 1961; Allen and Lamming 1961; Killeen 1967; Edey 1968; Cumming 1972). Edey (1968) found in mature Merino ewes that there was an increase of 5% in ovulation rate with a 2.5 kg increase in live weight between the range of 37.5 and 53.5 kg. This paper reports on the change in ovulation rate over this range of live weight in young maiden Merino and Merino x Corriedale ewes.

## II. MATERIALS AND METHODS

Live weight and ovulation rate data of seven flocks comprising 955 maiden Merino (Mer) and Merino x Corriedale (XB) ewes, aged between 18 and 27 months was collected from two properties in Western Victoria in late summer and autumn during 1969 to 1972. All ewes were weighed within 12 days of service and subjected to laparotomy and ovarian examination to count the numbers of corpora lutea. In each of the seven flocks, ewes were assigned to seven equal sized classes to provide 49 figures of mean live weight (L) and ovulation rate (OR). From these flocks, five groups of flocks were formed which differed in age, breed and time of mating (Table 1).

TABLE 1

Pseudovariables used in the analysis

| Group | Breed | Age (months) | Time of mating† | No. of Classes | Coding of variables A | B | C | D |
|---|---|---|---|---|---|---|---|---|
| 1 | XB | 18-24 | late-season | 7 | -5 | -1 | 0 | 0 |
| 2 | XB | 18-24 | mid-season | 7 | -5 | 1 | 0 | 0 |
| 3 | Mer | 18-24 | late-season | 14 | 2 | 0 | -2 | -1 |
| 4 | Mer | 24-27 | late-season | 7 | 2 | 0 | -2 | 2 |
| 5 | Mer | 18-24 | mid-season | 14 | 2 | 0 | 3 | 0 |

† Mid-season extends from January to March inclusive.
Late-season extends from April to May inclusive.

An unweighted stepwise regression analysis was conducted which took the form of $OR = (a + bL + cL^2)(d + eA + fB + gC - hD)$, and only those regression coefficients significant at the 5% level were retained in the final equation.

## III. RESULTS AND DISCUSSION

The regression analysis showed $OR = 0.958 + 0.0000735(\pm 0.0000189)L^2 + 0.0000123(\pm 0.0000026)CL^2$. This regression was significant ($P < 0.05$) and 58.8% of the variation in the ovulation rate was associated with a change in live weight. The relationship between live weight and ovulation rate for the cross-bred ewes (C = 0), Merino ewes mated in late-season (C = -2) and Merino ewes mated in mid-season

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(C = 3) is shown (Figure 1). The range in ovulation rate between 1.00 and 1.23 for all groups, agrees with the low ovulation rates found in 1½ year old maiden Romney ewes by Edgar (1962) and Wodzicka-Tomaszewska and Welch (1969), and with the ovulation rate reported by Giles (1969) in 1½ year old maiden Merino ewes.

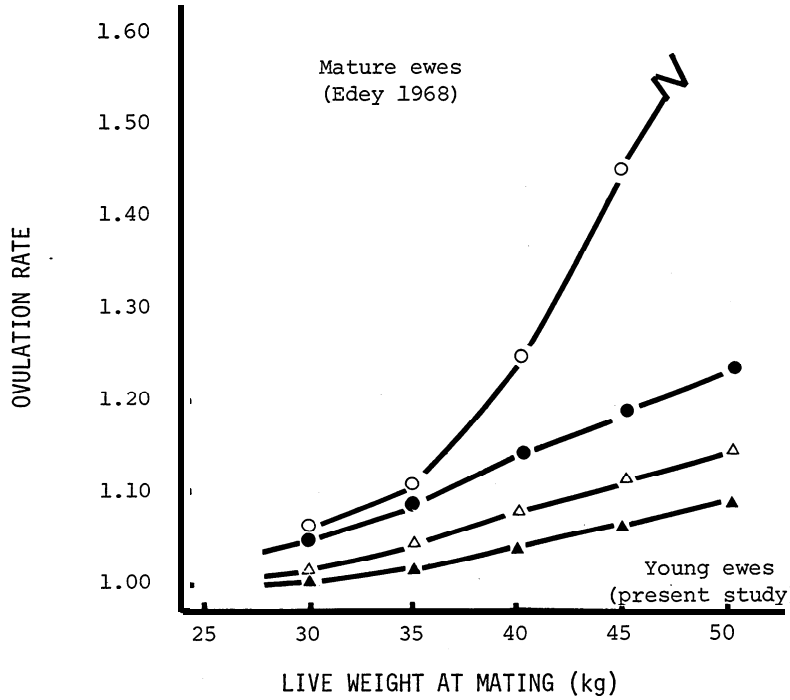


Fig. 1. Relationship between live weight and ovulation rate in young maiden Merino and Merino-Corriedale ewes compared to that in mature Merino ewes.

△——△ Regression line for XB ewes OR = 0.958 + 0.0000735$L^2$

▲——▲ Regression line for Mer ewes mated in late-season OR = 0.958 + 0.0000489$L^2$

●——● Regression line for Mer ewes mated in mid-season OR = 0.958 + 0.0001104$L^2$

Edey (1968) showed that the ovulation rate of mature Peppin Merino ewes during autumn is most responsive to change in live weight between approximately 37 and 50 kg. However, the extent of change in ovulation rate with change in live weight differs greatly between the mature Merino ewes studied by Edey and the young maiden Merino ewes of the present study (Figure 1). Edey (1968) found that the maximum increase in ovulation rate due to live weight change occurred between 40 and 49 kg where a 2.5 kg increase caused a 10% increase in ovulation. In our study however, within this live weight range for a young maiden ewe an increase of 2.5 kg only caused a 2.3% increase in ovulation rate for Merino ewes mated in mid-season, a 1.5% increase for the crossbred ewes and a 1.0% increase for the Merino ewes mated in late-season.

Our results indicate that supplementing young maiden Merino ewes solely to increase the proportion of twin bearing ewes at their first lambing may be questionable. Reardon and Lambourne (1966) found that under-nutrition of young Merino ewes till 15 months of age had a long term effect by decreasing the proportion of ewes producing twins at the third, fourth and fifth lambings. Thus the supplementing of young ewes may have little effect on the proportion of twin bearing ewes in the short term but may be beneficial in the long term.

McLaughlin (1966) Reardon and Lambourne (1966) and Lax and Brown (1968) found that the incidence of twin births was not affected by the live weight of young ewes which differs from the findings presented here. However Gunn, Doney and Russel(1969) found with 2½ year old Scottish Blackface ewes that body condition at mating does influence the proportion of multiple births. Each of these reports defines the effect of live weight or body condition on lambing percentage which confounds ovulation rate, fertilization rate and embryo survival rate. This may explain the conflict between these results and the results presented here.

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