REPRODUCTIVE RATE IN A NATURAL FLOCK OF MERINO SHEEP

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SUMMARY

A flock of medium peppin Merinos comprising ten ewes and three rams was established in 1965 and has been run as a natural flock with no control of breeding and no separation of the sexes. Stocking rate is maintained by annual culling at 60% above the field station average, to keep the flock to 180 sheep.

The average age for a ewe to have its first lamb is 1.8 years and subsequent lambs are at an average interval of 284 days. A ewe averages seven lambs in a lifetime. A quarter of the ewes lamb twice a year and lambing is spread throughout the year but with a peak in May and June. The ewes that are over two years old have produced 1.2 lambs per year, with only 4% of births being twins. No changes in reproductive rate have developed over time.

Lamb mortality in the first 20 days is 8%, including 3% of lambs being born dead.

INTRODUCTION

The conventional pathway to increase lambing rates in Merino sheep is to seek increased twinning by mating at the time of highest ovulation rates, through improved nutrition and through the use of high fertility strains such as the Booroola. However, many farmers dislike a high proportion of twin lambs because they have a higher neo-natal mortality and require better nutrition than single born lambs during their first year of life.

The alternatives are to increase the frequency of lambing and to breed ewes at an earlier age. These alternatives have received scant attention in Australia. Examples of Merinos lambing twice a year come from Russia, Hungary, Brazil, South Africa and Australia (Hunter, 1968). The ability to achieve more frequent lambing depends on the length of lactation anoestrus and occurrence of seasonal anoestrus. Smith (1964) found that the interval from lambing to first oestrus is short after an autumn lambing (45 days), but long after a July lambing (189 days). The proportion of ewes that are anoestrus varies in controlled breeding systems. In W.A., Oldham (1978) found that the proportion of ewes ovolating falls continuously from April to a low of 5% in December. By contrast, at Trangie, N.S.W., Dun et al. (1960) obtained a minimal value of 64%. The success of more frequent lambing will depend on a low level of anoestrus.

Yearlong presence of rams might feasibly stimulate oestrus, and if ewe lambs are not separated from the flock to be "weaned", reproduction might begin at an earlier age. These possibilities were examined in a flock of medium peppin Merinos maintained as a natural flock for the purpose of studying natural selection on production characteristics. This is a progress report on reproduction in this flock.

MATERIALS AND METHODS

In March 1965, ten medium peppin Merino ewes of varying ages from the Trangie Random Selection Flock and three rams from the same flock were put to

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together as a flock. The basic management of this flock is limited to annual shearing, tail docking and flystrike control. The sheep graze at a stocking rate 60% above the normal rate of the Yalanbee Experiment Station, Bakers Hill W.A.. This is to push selection pressure towards sheep that will survive harsh conditions. The area available to the sheep was increased until the flock reached 180 sheep. Thereafter, an annual cull is made at random from the current year’s lambs to reduce the numbers entering the flock to 20 females and ten males.

The flock is checked twice weekly for lamb births and for deaths. New lambs are eartagged, weighed and their dams identified. Records of births, birthweights, and deaths are kept in a databank using a FORDATA SYSTEM (Adam and Trotter 1977).

RESULTS

The data presented exclude that for foundation ewes and covers the period 1965-1979. The average age at first lambing (676 days) varies considerably (Fig. 1) but 73% have lambed by the time they are two years old. The interval between lambings varies widely (average 284 days) (Fig. 2), with 75% of lamblings being within a year of the previous one: 50% of ewes conceive within 100 days of parturition. As a consequence 25% of the ewes lamb, on average, twice a year, but the proportion fluctuates with seasonal conditions being low in seasons 1971, 1972, 1977, 1978, and 1979.

Lambing has occurred in every month of the year (Fig. 3), but there is a pronounced peak in May and June mainly due to the past three years. Prior to this, lambing was evenly distributed over the year. This may be associated with nutritional status which is only high in spring, a feature accentuated in poor seasons such as those in 1977-1979. Only 4% of births are multiples.
The number of lambs born per ewe per year, for ewes more than two years old at the beginning of a year, has been 1.19, 1.12, 1.36, and 0.97 for the three-year periods 1968-70, 1971-73, 1974-76, and 1977-79 respectively. Lambing performance changes with age (Fig. 4) with a peak of 1.32 in the sixth year. There has been no evidence of a change in this pattern with time. The maximum number of lambs born to a ewe in her lifetime is 18, with an average, for cohorts in which all ewes are now dead, of seven.

- Fig. 4. Lambs per ewe per year at different ages

- Fig. 5. Distribution of deaths
Three percent of the lambs are born dead but of those born alive approximately 95% survive to 20 days and 88% to 100 days old. The average lifespan of females born alive is 3.0 years; there is a high mortality during the first two years (Fig. 5). The age structure for females is: 16% 1 year; 33% 1-5 years; and 51% >5 years old. Sixty-six per cent of the flock are female.

**DISCUSSION**

Under a system of natural breeding this flock of Merinos has a higher than normal reproductive rate which has occurred through more frequent lambing and early breeding. This has been achieved at a higher than normal stocking rate. The average number of lambs born is well above that in husbanded flocks lambing in autumn or spring (eg. Davies 1964; Arnold and Charlick 1976). Most ewes, even those lambing after an adverse period of nutrition in pregnancy raise their lambs.

Changes in the number of lambs born with age of ewe were obtained with Merino ewes by Mullaney and Brown (1969) in Victoria and with peppin ewes in Queensland by Turner and Dolling (1965). Our ewes perform better than those of Mullaney and Brown, and Turner and Dolling in the first five years of life and worse thereafter. However, the average lifetime production of seven lambs must compare favourably with that of ewes in most husbanded flocks.

Our results to date pose a number of questions about why the flock behaves as it does and the potential of the approach as a simple cheap management option. The disadvantages are that the potential presence of lambs at any time of the year makes the planning of other husbandry practices such as lamb marking, mulesing and shearing more difficult. The high mortality in the first year of life can be avoided by improved nutrition but this itself may pose practical problems. It could be that restriction of lambing to ten months of the year would ease these problems and allow mulesing and shearing to be done in a two-month period. Creep feeds could be used to improve nutrition when necessary.

Clearly, our ewes do not follow the pattern of anoestrous obtained by Oldham (1978) in W.A. Possibly other strains of Merinos will perform differently, and this we are testing currently. If they do, the role of the rams in influencing anoestrous must be questioned. Their role in stimulating early sexual maturity must also be raised because in husbanded flocks sexual maturity at 15 months of age is reached only in well grown animals whereas our ewes averaged only 30 kg at first conception. Pheromonal stimulation may be operating, but has never been studied in sheep.

**REFERENCES**