

OBSERVATIONS ON LITTER SIZE AND REPRODUCTIVE WASTAGE USING ULTRASONIC SCANNING

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Most studies on reproductive wastage in sheep involve sampling the flock at various times to make estimates of viable or potential offspring. Observations made after ovulation are usually destructive to the foetus. Real Time ultrasound technology (Fowler and Wilkins 1982) overcomes the need for sequential sampling by allowing repeated observations on the same animals using a non-invasive and non-destructive technique. The ovine foetus can be observed using ultrasound at 30 days or less post conception (p.c.) but determination of the number present is difficult at early stages. Edey (1969) reviewed prenatal mortality and concluded that loss after 30 days p.c. was small. However, we considered that wastage beyond that stage may be greater in flocks with high ovulation rates. We also wished to examine the use of ultrasound for determining litter size at various stages in a highly fecund flock. The flocks of Fowler and Wilkins (1982) rarely carried more than two foetus/ewe.

A group of 33 Booroola Merino ewes was joined to fertile rams on the second cycle after oestrus synchronisation. Numbers of ova shed by each ewe were determined by laparoscopy. Ewes were examined with an ultrasonic scanner (A.D.R. 2130) at mean stages of 30, 40, 47, 54, 61, 73, 82 and 93 days p.c. (range, mean \pm 2 days). On each occasion the numbers of viable foetus were determined. The ewes were lambed under constant supervision indoors to determine the number of lambs carried to term. Two ewes lambed early in the paddock and their litter sizes were unknown.

All ewes were raddled over a period of five days from 24.4.1981 to 28.4.1981 and 201 ova were shed. There were at least 69 foetus present at 30 days p.c. (possibly 77). The numbers estimated thereafter were 67, 61, 61, 61, 60, 60 and 60 at mean stages of 40, 47, 54, 61, 73, 82 and 93 days p.c. respectively. Fifty nine lambs were born (assuming no late loss in the two ewes unobserved). The greatest wastage occurred between ovulation and 30 days p.c. with approximately two thirds of ova shed failing to develop. At 30 days p.c. there was no indication of conception in five ewes. They had probably suffered total fertilization failure or total loss of embryos before implantation. Two ewes had evidence of pregnancy at 30 days but no distinguishable foetus and were found non-pregnant subsequently. They may have conceived and been in the process of resorbing when observed at 30 days. One ewe had at least one viable foetus at 30 days but was non-pregnant thereafter. Another ewe had indications of three foetus at 30 days but only one remained subsequently. Between the 40 and 47 day observations, one ewe lost 1 of 2 foetus, three ewes lost 1 of 3 and one ewe lost 2 of 3. Loss of one foetus was also found in one ewe between 61 and 73 days and in another between 93 days and term. These latter two ewes had mummified or resorbed foetal remains present at term.

These data indicated loss of 14-23% of potential foetus between 30 days p.c. and term. Overall accuracy of diagnosis was 92% from 40 days onwards. Least errors occurred at 61, 82 and 93 days but scanning was easier from 54 to 73 days. Experiments are in progress to further investigate the wastage reported here and to compare it with loss in flocks with 'average' ovulation rates.

EDEY, T. N. (1969). Anim.Breed.Abstr. 37 : 173.

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