REAL TIME ULTRASOUND FOR DIAGNOSING LITTER NUMBER IN NATURALLY MATED FLOCKS

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Real Time ultrasound scanning has been shown by Fowler and Wilkins (1982) to be an accurate and feasible method for determination of litter number in sheep. Those experiments were designed to establish the basic accuracy of the technique and to determine the optimal stage at which the scanning procedure should be carried out. The flocks used had synchronised dates of conception which gave a small range in stage of gestation within groups when scanned. The minimum stage of gestation at which an accurate diagnosis is possible and the maximum stage of gestation at which scanning is easily done both restrict the time span that is available for scanning a flock with a range in conception dates. We are currently in the process of determining the best approach for scanning flocks which are naturally mated and which therefore have an unknown distribution of dates of conception. The accuracy of diagnosis in three such flocks is now discussed.

Experiment 1 used a flock of 521 Merino ewes with a low twinning rate which were joined in the paddock for six weeks.They were scanned at a time which gave a possible range in pregnancy of 43-88 days. Experiment 2 used a flock of 802 Border Leicester x Merino crossbred ewes with a high twinning rate which were joined in the paddock for six weeks. These ewes were scanned when stage of gestation ranged from 61-101 days. Experiment 3 used a flock of 330 ewes (248 Merino and 82 Border Leicester x Merino) in which the dates of joining were manipulated so that there were 72% of the pregnant ewes in the first 17 days, 32% in the second 17 days and 6% thereafter. A large proportion of non-pregnant ewes was also included. This flock was scanned on three occasions, when the ranges of gestation were 32-73 days, 47-88 days and 60-101 days. Experiments 1 and 2 were supervised during lambing to determine numbers of lambs born to each ewe.Pregnant ewes in experiment 3 were slaughtered to determine litter size.

In experiment 1 the diagnoses at scanning showed 85% and 7% of ewes carrying one and two foetus respectively with the balance non-pregnant. There were no discrepancies between scanning and lambing results in either the twin bearing or non-pregnant ewes. Seven of the 441 predicted single bearers were not observed to lamb. We consider there was a strong possibility of wastage in these ewes between scanning and term since most errors in scanning are failure to observe foetus present. Low levels of wastage in mid-late pregnancy have been observed in other experiments (Wilkins et al ., 1982). Nevertheless, there was a maximum error rate of 1.3%. In experiment 2, we predicted proportions of 3, 29, 64 and 4% for non-pregnant, single, twin and triplet bearing ewes respectively. Non-pregnant ewes were all diagnosed correctly. There was a total of 6.1% with discrepancies between scan and lambing results, the majority involving triplet bearing ewes diagnosed as having twins. There was also the possibility of wastage between scan and term in this experiment. Diagnosis of multiple pregnancy was 97% correct. In experiment 3, accuracy of diagnosis was over 99% when scanned on the latter two occasions. On the first occasion (32-73 days), the ewes least advanced in pregnancy presented some difficulty which would have resulted in an error of 2.7% if these were not scanned again later.

These experiments have shown that we can maintain high levels of accuracy when scanning flocks with a range of gestational age from 47-101 days. In these flocks the stage of pregnancy of any given ewe was unknown to the operator. Scanning could be carried out later than done here but this would detract from the advantages of altering the management of the ewes between diagnosis and lambing.

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