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Oestrus activity in Booroola Merino, New Zealand fine wool Merino and Poll Dorset ewes from October to February.

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INTRODUCTION

Earlier lambing and even autumn lambing is becoming an important attribute of a breed or strain of ewe especially on summer dry hill country. In Australia, merino ewes are mated from October to December (Knight *et al.*, 1975; Oldham and Cognie, 1980) but their New Zealand counterparts do not appear to have this ability. Kelly *et al.* (1976) found a mean onset of oestrus of 7 March for Merino ewes at Invermay Agricultural Research Station while Smith *et al.* (1989) found no oestrous activity before late January in Australian fine wool merinos and New Zealand medium to strong wool Merinos at the Tokanui Research Station. Selection for autumn lambing has been shown to be successful in Dorset and Dorset x Romney flocks (Andrewes, 1983; McQueen and Reid, 1988).

The experiment reported here compares the onset of oestrus activity in New Zealand fine wool Merino (NZM) and Booroola Merino (BM) ewes, and of a spring lambing flock of Poll Dorset (PD) ewes with a flock of Poll Dorset ewes (ALPD) which had been selected for five years for autumn lambing.

MATERIALS AND METHODS

Twenty five ewes of each genotype were randomly selected from flocks at the Levin Horticultural Research Centre ($40^{\circ}\pm 37'S$; $175^{\circ}\pm 16'E$). Intravaginal devices (CIDR, type G, Carter Holt Harvey, Hamilton, New Zealand) were inserted for 12 days and six vasectomized PD rams were introduced at CIDR removal. After six days marked ewes were recorded and the rams removed. First CIDR removal was on 14 October and the procedure was repeated with the same ewes every 23 to 28 days until 11 November for ALPD ewes and 27 January for the other genotypes. ALPD ewes were required for mating as part of an autumn milking flock. Ewes were weighed at the dates shown in (Table 1).

Liveweights were analysed by analysis of variance and the proportions of ewes exhibiting oestrus at each date were analysed by Chi Squares.

RESULTS

There were differences in liveweight ($P < 0.001$) be-

TABLE 1 Liveweights of the ewes (mean \pm SEM)

Breed/strain of ewe	Date of weighing				
	3 Oct	20 Oct	17 Nov	15 Dec	10 Jan
NZM	43.8 \pm 0.2	46.1 \pm 0.2	56.3 \pm 0.4	50.4 \pm 0.2	51.6 \pm 0.3
BM	42.6 \pm 0.1	45.2 \pm 0.2	54.5 \pm 0.2	50.5 \pm 0.3	53.3 \pm 0.2
PD	73.5 \pm 0.4	72.7 \pm 0.4	76.9 \pm 0.5	74.0 \pm 0.4	77.7 \pm 0.4
ALPD	70.2 \pm 0.2	72.9 \pm 0.2	79.3 \pm 0.3	-	-

tween genotypes and liveweight increased ($P < 0.001$) over the experimental period (Table 1).

The percentage of ewes exhibiting oestrus is shown in Figure 1.

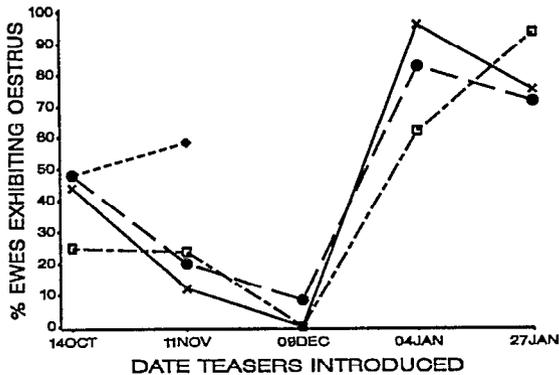


FIG 1 Percentage ewes exhibiting oestrus after CIDR removal. x—x Booroola Merino; ●—● New Zealand Fine Wool Merino; ○—○ Autumn Lambing Poll Dorset; □—□ Poll Dorset.

More ALPD than PD ewes exhibited oestrus in November (58% vs 24%; $P < 0.001$). Oestrous activity in NZM, BM and PD ewes decreased ($P < 0.01$) from October to a low in December. There were no differences at anytime in percentage ewes exhibiting oestrus between BM and NZM ewes. In early January, more merino ewes exhibited oestrus than PD ewes (90% vs 62%; $P < 0.05$) but by late January there were no differences.

DISCUSSION

Failure of a high percentages of BM and NZM ewes to exhibit oestrus before early January confirms the inability of merino ewes in New Zealand to mate from October to December (Kelly *et al.*, 1976; Smith *et al.*, 1989). It is not known if this difference between merinos in New Zealand and in Australia (Knight *et al.*, 1975; Oldham and Cownie, 1980) is environmental or genetic. Onset of oestrous activity without the use of CIDR pretreatment would be at least three weeks later than indicated in Figure 1.

Onset of oestrous activity in PD ewe in early

January is constant with previous observations on the onset of ovulatory activity in PD ewes at the Levin Horticultural Research Centre (Knight *et al.*, 1989). Screening and selection of PD ewes for early lambing rapidly increased the flock's ability to exhibit oestrus in November. This confirms earlier reported successes for selection for autumn lambing in PD ewes (Andrewes, 1983) and PD x Romney ewes (McQueen and Reid, 1988). While more work is needed on the heritability of early oestrus, these results suggest that early lambing flock can be developed by selection.

The decline from October to December in percentage of ewes exhibiting oestrus in PD, BM and NZM ewes is similar to the decline in ovulatory activity in ovaries of PD ewes at the Levin Horticultural Research Centre over the same period (Knight *et al.*, 1989). A similar decline in oestrous activity from October to December has been reported for strong wool merino ewes in Western Australia (Oldham and Cownie, 1980). This raises the question of whether selection for autumn lambing has been a selection for an earlier onset or a later end to the breeding season?

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