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*Brief communication*

OESTRUS AND OVARIAN ACTIVITY OF BOOROOKA  
MERINO CROSSBRED EWE HOGGETS

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INTRODUCTION

Dyrmundsson (1973) reviewed the importance of liveweight and breed as factors influencing the number of hoggets which exhibit oestrus in their first autumn. However, information on ovulation rate and the number of oestrous cycles which hoggets experience is limited.

The technique of laparoscopy enables repeated observations of the reproductive tract to be made and thus ovulation rate can be recorded throughout the breeding season.

In view of the interest in the fecundity of the Booroola merino and its crosses, a trial using laparoscopy was initiated with Booroola crosses, Coopworth, Romney and Coopworth x Romney ewe hoggets.

MATERIALS AND METHODS

Ewe hoggets (342) of mixed Booroola, Coopworth and Romney breeding, born between August 14 and September 25 and weaned in the first week of December 1978, were constituted in six breed groups randomly divided within breeds into two groups of comparable mean liveweight. These groups, High Plane (HP) and Low Plane (LP) were grazed separately on ryegrass/white clover dominant pastures to establish a liveweight difference of about 5 kg by the time of first oestrus.

Vasectomised, harnessed rams were used to detect oestrus and the ovulation rate was determined by laparoscopy within five to twelve days.

RESULTS AND DISCUSSION

Liveweight differences between the nutritional groups were not significant until February 1979 but then remained so until the end of the trial (Fig. 1).

A high proportion of the hoggets (93.6%) reached puberty with a significant difference between HP and LP.

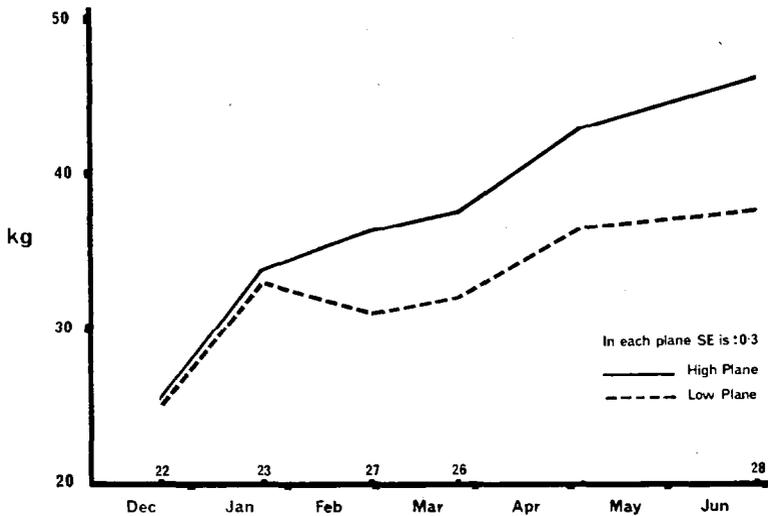


FIG 1: Mean monthly liveweight (kg).

Many factors appeared to influence the date of first oestrus, breed and plane of nutrition being highly significant. There was a significant positive correlation between date of birth and date of first oestrus and a significant negative correlation between liveweight on March 12 and date of first oestrus.

TABLE 1: ATTAINMENT OF PUBERTY AND LIVWEIGHT AT FIRST OESTRUS

Treatment	No.	Percentage Showing oestrus	Liveweight (kg)	Liveweight (kg)	
				Single ovulating	Multiple ovulating
HP	180	96.7*	40.07 ± 0.3*	39.15	40.12
LP	162	90.1	36.3 ± 0.3	35.65	37.21

The mean dates of first oestrus April 18 ± 1 day (HP) and April 26 ± 1 day (LP) differed significantly.

The effect of breed was highly significant in the case of the Booroola x Coopworth group with a mean date of first oestrus April 8 ± 2 days compared with the ¾ Coopworth x Booroola April 18 ± 2 days, Coopworth April 18 ± 1 day and ¾ Romney x Booroola April 23 ± 1 day.

Booroola crossbred hoggets reached puberty at a lower mean liveweight than the other breeds and crosses. The first hogget oestrus occurred on March 10 and the last on June 22, the main oestrous activity extending from April 20 to June 22 during which period approximately one third of the total flock were cycling.

The duration of the breeding season and number of cycles were significantly greater in the Booroola x Coopworth than the other breed groups. The different nutritional planes also brought about a significant difference in number of cycles and duration of the breeding season on a total flock basis (Table 2), but not within the Romney and Coopworth x Romney breed groups.

TABLE 2: DURATION OF BREEDING SEASON, NUMBER OF OESTROUS CYCLES AND OVULATION RATE

<i>Treatment</i>	<i>Duration of breeding season (d)</i>	<i>Number of oestrous cycles</i>	<i>Ovulation rate</i>	
			<i>All cycles mean</i>	<i>First oestrus</i>
HP	81 ± 2**	4.3 ± 0.1**	1.55 ± 0.5*	1.76 ± 0.6**
LP	66 ± 2	3.6 ± 0.1	1.39 ± 0.5	1.47 ± 0.6

Silent heats were experienced by a majority of the hoggets, 56% having one, 25.6% having two or more and the remainder showing oestrus and ovulation for the first time simultaneously. Plane of nutrition did not affect the occurrence of silent heats.

Ovulation rate was significantly affected by breed with the ¾ Romney x Booroola ( $1.72 \pm 0.08$ ) and Booroola x Coopworth ( $1.70 \pm 0.11$ ) being higher than the other breed groups. The effect of plane of nutrition on ovulation rate was less marked than that of breed, the HP ovulation rate exceeding that of LP by 11.5% ( $P(0.05)$ ).

The peak ovulation rate occurred at first oestrus in both nutritional groups. The progressive decline in ovulation rate during the breeding season (Fig. 2) was in marked contrast to that of mature ewes which normally rise to a peak later in the breeding season.

Positive correlations were found between ovulation rate and the duration of the breeding season in both flocks (HP,  $r = +0.17$   $P(0.05)$ ; LP,  $r = +0.25$   $P(0.01)$ ). Breed groups with the highest mean ovulation rates exhibited the most oestrous cycles.

The repeatability of ovulation rate between successive cycles was highest in the three Booroola groups (+0.65) and lowest in the Coopworth, Romney and Coopworth x Romney groups (+0.30).

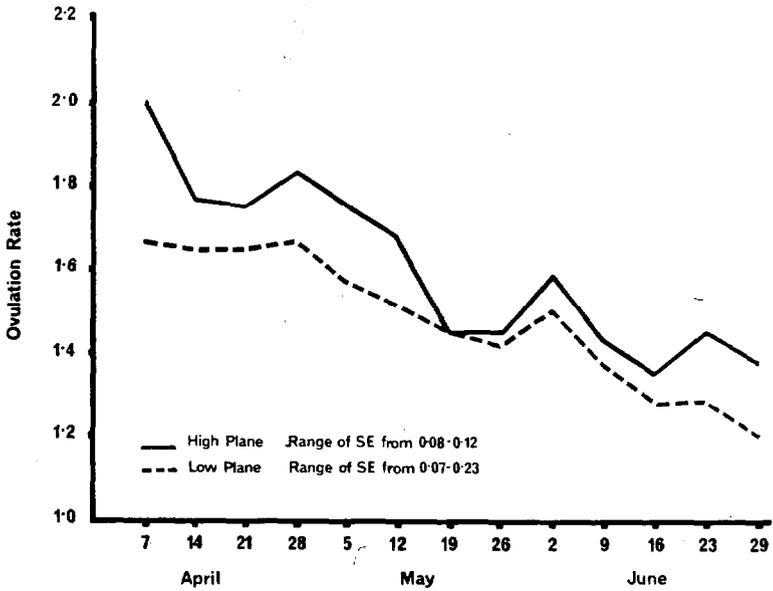


FIG 2: Mean ovulation rate.

#### REFERENCE

Drymundsson, O. R., 1973. *Anim. Breed. Abstr.*, 41: 273.