

THE RELATIONSHIP BETWEEN LIBIDO SCORE AND FERTILITY  
IN MERINO RAMS

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Summary

The proportions of strong wool South Australian Merino rams which failed to serve in pen libido tests were 16/49(33%), 6/47(13%) and 6/43(14%) over 3 years respectively. Of the rams that served at least once, 25 were singly mated to groups of approximately 9 or 27 ewes in each of three years. For these, the total number of serves in the pen libido tests and number of ewes lambing were not correlated.

The incidence of inhibited rams suggests that rams chosen for single sire matings should be screened; however, selecting between rams which serve does not seem warranted when rams are mated individually with relatively small groups of ewes.

I. INTRODUCTION

Mattner, Braden and George (1973) have suggested that 20 to 50% of inhibited rams in a group can markedly depress flock fertility. Cahill et al (1974) also have implicated ram mating performance as a cause of reproductive wastage in flocks in which overall reproduction rate is high. Thus, ram mating performance may be important in syndicate matings.

Identification of rams that fail to serve is even more important in single sire matings which are used extensively in the sheep industry. Dolling (1970) has described a parent South Australian Merino stud in which approximately 20 single sire mating groups were used. An analysis of stud book records of British breeds in Australia revealed that a large proportion of flocks (mean overall breeds 24%; range 9 to 60%) use one ram only (Mullaney, P.D. pers. comm.)

Pen libido tests, as described by Mattner, Braden and George (1971), can be used to classify rams as 'workers', 'mounters' or 'non-workers' on the basis of the number of mounts and services achieved. For single sire matings a choice may have to be made between rams achieving at least one service.

Cahill, Blockey and Parr (1975) paired Corriedale rams of high and low serving capacity and found no differences in their fertility when mated to maiden Merino ewes. Wiggins, Terrill and Emik (1953), using individually mated rams of four breeds, found significant correlations between ram libido and percentage of ewes lambing, but Hulet et al (1962) observing the same sire breeds continuously for 7 days found no relationship. Merino rams have been studied in flock matings by Mattner, Braden and George (1973), but to our knowledge, no data have been published on the relationship between libido and fertility for singly mated Merino rams,

This paper reports the incidence of poor mounting and serving ability in strong wool South Australian Merino rams and examines the relationship between total number of services achieved in pen libido tests and individual ram fertility as reflected by ewes lambing per ewe joined.

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## II.. MATERIALS AND METHODS

The observations were made at Turretfield Research Centre, Rosedale, South Australia. The sheep were from three-flocks in a selection experiment; a control, and two flocks selected for number of lambs weaned and adjusted weaning weight respectively. There have been no consistent differences in the number of ewes lambing per ewe joined in these flocks (Walkley, unpublished data).

### (a) Rams and ewes

Forty nine rams aged  $1\frac{1}{2}$  years, 47 rams aged  $2\frac{1}{2}$  years and 43 rams either  $1\frac{1}{2}$  or  $2\frac{1}{2}$  years old were pen libido tested in November or December in 1972, 1973 and 1974 respectively. Except for 24 observed in 1973, all rams were virgins when tested.

The ewes in the mating groups were aged  $1\frac{1}{2}$ - $3\frac{1}{2}$ ,  $1\frac{1}{2}$ - $4\frac{1}{2}$  and  $1\frac{1}{2}$ - $4\frac{1}{2}$  years in each year respectively; the groups contained similar proportions of ewes of each age.

### (b) Pen libido and semen tests

Oestrus was induced in spayed ewes by injections of progesterone and oestradiol as described by Mattner, Braden and George (1971). Groups of four or five ewes in oestrus were placed in pens and rams introduced singly for 20 minutes. The number of mounts. and services were recorded for each test. Each ram was tested twice in 1972 and three times in 1973 and 1974. Libido score was defined as the total number of services achieved in a series of tests in a particular year.

Before mating, semen samples were collected from the rams by electro-ejaculation and these were scored for consistency and microscopic motility. The testes of all rams were palpated for detection of morphological abnormalities,

All rams achieving at least one service in the pen libido tests and having satisfactory semen and testes were eligible for selection as sires,

### (c) Mating groups

In January-February each year, 25 rams were penned singly with groups of ewes for 6 weeks. Ten of these rams were mated to groups of approximately 27 ewes (range 22-30, 3 year mean 27.4) and 15 rams were mated to groups of approximately 9 ewes (range 7-10, 3 year mean 8.9).

### (d) Lambing observations

Prior to lambing in June-July each year, all ewes were individually branded and the three flocks separated for lambing. Lambs were identified with their dams daily. From the mating and lambing records the number of ewes lambing per ewe joined was determined for each ram mated.

## III. RESULTS

In 1972, 16 of the  $1\frac{1}{2}$  year-old rams tested ( $n=49$ ) failed to serve and nine of these also failed to mount. For the 'worker' rams ( $n=33$ ) the mean and standard error for libido score was  $2.1 \pm 0.2$  and the mount to serves (m/s) ratio  $17.2 \pm 3.1$ . Of the same group of rams ( $n=47$ ) tested as  $2\frac{1}{2}$  year-olds in 1973, six failed to serve and five of these also failed to mount in either year. The mean libido score and m/s ratio for the 1973 tests were  $3.7 \pm 0.3$  and  $13.7 \pm 1.7$  respectively ( $n=41$ ). Six of the 43 rams tested in 1974 failed to serve and 2 failed to mount or serve. The

mean libido score and mean m/s ratio were  $4.9 \pm 0.3$  and  $9.9 \pm 1.1$  resp.

Correlation coefficients ( $r$ ) for libido score and ewes lambing per ewe joined were calculated, within years, after angular transformation of the lambing data, for the 10 rams mated to groups of approximately 27 ewes and the 15 mated to groups of approximately 9 ewes. Pooled correlation coefficients were then calculated for all rams, within years. The relationship between libido score and the transformed lambing data for individual  $2\frac{1}{2}$  year old rams tested in Nov. - Dec. 1973 and mated in January, 1974 is shown in Fig. 1.

For  $1\frac{1}{2}$  year-old rams tested in December 1972 and mated in January 1973 the correlation coefficients were  $r_8 = 0.167$ ,  $r_{13} = -0.010$  and  $r_{23} = 0.014$ . The corresponding values for  $2\frac{1}{2}$  year-old rams were  $r_8 = -0.015$ ,  $r_{13} = -0.275$  and  $r_{23} = -0.230$ . For the December 1974 libido test and January 1975 mating the values were  $r_8 = 0.336$ ,  $r_{13} = -0.093$  and  $r_{23} = -0.002$ . In no case was the observed correlation coefficient significantly different from zero.

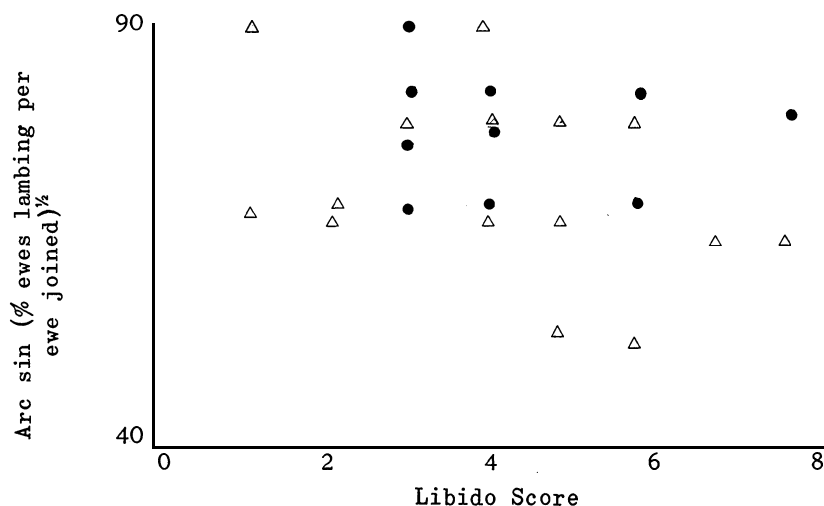


Fig. 1 The relationship between libido score and arc sin (% ewes lambing per ewe joined)<sup>½</sup> for individual  $2\frac{1}{2}$  year-old rams tested in Nov.-Dec. 1973 and mated January 1974.

Δ Rams mated to average 8.9 ewes    ● Rams mated to average 27.4 ewes

#### IV. DISCUSSION

The proportion of  $1\frac{1}{2}$  and  $2\frac{1}{2}$  years-old strong wool South Australian Merino rams which failed to serve in two or three pen libido tests in three years' observations ranged from 6/47 (13%) to 16/49 (33%). Mattner, Braden and George (1973) reported that 0, 10% and 44% of medium wool Peppin Merino rams, from three studs, failed to mount or serve a ewe in pen libido and 48-hour field tests; with fine wool Merino rams the proportion was 17%.

Since inhibited rams have now been recorded in three strains of Australian Merinos, such rams will probably be found in any Merino flocks. Libido testing 'rams to be used in single matings would therefore seem worthwhile. As many British breed studs use only one ram (Mullaney, P.D. pers. comm.), there is a need to study the incidence of inhibited rams in these breeds too. Although Mattner, Braden and George (1973) have

observed that a large proportion (14/17) of inactive rams begin to mount ewes at some stage during a 5 week joining period, their fertility was generally lower than that of their active counterparts.

The low correlation coefficients between total number of services in tests and number of ewes lambing per ewe joined determined here for South Australian Merinos, suggest that selecting between 'worker' rams on libido score is not warranted when rams are individually mated to small groups of ewes. This conclusion is supported by the findings of Cahill, Blockey and Parr (1975) and Hulet *et al* (1962). It is, however, inconsistent with Wiggins, Terrill and Emik (1953) who found ram libido and fertility were significantly correlated.

However, further investigation of the libido score-fertility relationship may be justified. Firstly, in this study and those cited in the preceding paragraph, the number of ewes per ram may not have been high enough to extend to the limit rams with even the lowest libido scores, since Hulet (1966) found that individual rams could, on average, impregnate 160 of 300 ewes, to which they were mated, in less than 3 weeks. Secondly, as suggested by Wiggins, Terrill and Emik (1953), more precise measures of fertility, such as percentage of ewes pregnant to first service or number of services per conception, may reveal a relationship. For example, Blockey (quoted in Paterson, 1974) found no difference in the overall pregnancy rate of groups of heifers after 10 weeks\* mating, with bulls of either high or medium serving capacity, but there were differences (58.5% vs. 78.5%) in conception rate to first service.

#### V. ACKNOWLEDGEMENTS

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