

QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES  
DIVISION OF ANIMAL INDUSTRY BULLETIN No. 159

## PERFORMANCE OF EWES SUPPLEMENTED WITH A HOME-MADE, GRAIN-BASED, PROTEIN SUPPLEMENT

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### SUMMARY

The performance of ewes supplemented throughout the year with a high protein premix compounded with grain to constitute a home-made block was investigated. Consumption of the supplement was greatest in the July to September period, and supplemented sheep were significantly heavier during this period only.

No significant differences occurred in reproductive parameters or survival rate. One control group cut significantly less wool than one of the supplemented groups in 1970; no difference was recorded in 1971.

### I. INTRODUCTION

Paull (1972) suggested that the quality of pastures in the Roma region deteriorates during late winter and spring, thereby reducing the productivity of grazing animals. Supplements of protein or non-protein nitrogen are frequently used in the area in an attempt to alleviate this problem. Marston (1932) fed a supplement of bloodmeal and rock phosphate to sheep in the Emerald area on a year round basis and obtained significant animal production responses mainly in the spring months.

With urea-molasses mixture, Entwistle (1972) obtained a clean wool weight increase for the October–December period. This effect was significant for the whole year. No response to urea-molasses mixture was found by Entwistle and Knights (1974) in northern Queensland and Beasley and McMeniman (1975) in southern Queensland.

This paper describes the effect a nitrogen-grain supplement had on the productivity of ewes in terms of body-weight, reproduction parameters, survival rate and wool production over 30 consecutive months.

### II. MATERIALS AND METHODS

The trial was conducted at a site 20 km south of Surat (149° E, 27° 18' S). For the first 12 months, an area of 1 200 ha, divided into two equal sized paddocks, was used. After 12 months, the area was further subdivided to form four equal-sized paddocks.

The paddocks consisted mainly of treeless downs country with areas of creek flats and red soil carrying poplar box (*Eucalyptus populnea*).

A flock of 1 280 maiden Merino ewes, 18 to 20 months old was allocated at random to four groups after shearing in July 1969, and individually ear tagged. Groups and treatments were:

- Group 1, unsupplemented, mated once a year.
- Group 2, unsupplemented, mated more than once a year.
- Group 3, supplemented, mated once per year.
- Group 4, supplemented, mated more than once per year.

Treatments for groups 2 and 4 were included as district opinion held that sheep supplemented on a year-round basis should be capable of a greater reproductive performance.

The ewes were weighed 19 times during the trial and each time were yarded overnight before weighing. It was intended to weigh monthly except for the lambing period but seasonal and other conditions prevented this.

The ewes were shorn in June 1970 and 1971. Individual wool weights were obtained.

All sheep were mated during the periods of 10 July to 27 August 1969, 12 March to 23 April 1970, and 10 May to 22 June 1971. The late mating period in 1969 was caused by adverse seasonal conditions early in the year and the owner's desire to have a lambing for the year.

In addition, groups 2 and 4 were mated from 15 October to 26 November 1970.

At all matings, oestrus activity was determined by using rams harnessed with mild Sire-sine crayons (Radford, Watson and Wood 1960). Rams were rotated between groups at fortnightly intervals.

Pregnancy was determined by an ultra-sonic foetal blood flow detector\* (Fraser and Robertson 1968 and Lindhal 1969) on 3 December 1969, 23 July 1970, and 2 September 1971. The presence of lambs was determined using the technique of Dun (1963) on 10 February 1970 and 15 October 1970.

The sheep were run as two groups, supplemented and unsupplemented, except for the following occasions: lambing periods 15 July to 15 October 1970; 16 March to 28 April 1971; and 9 August to 8 December 1971; and the joining period 15 October to 26 November 1970. During these periods, the sheep were run as individual groups.

All lambs were removed before they were 6 months old.

At each weighing, the sheep were moved to a paddock which, before that weighing, carried one of the other treatment groups.

Rainfall was recorded at the station homestead 1.5 km from the trial site.

The supplement used was a home-made block. This block consisted of a high nitrogen premix†, salt, water and grain (oats or sorghum) (Tulloh, Watson and Burnell 1963, Campbell and Irvine 1966). The blocks contained 20% protein equivalent. Supplemented ewes were fed *ad libitum* and consumption was recorded.

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\* Sonicaid—Allard International Pty Ltd, Bucks, United Kingdom.

† Rumevite Premix—Rumevite Australia Pty Ltd.

### III. RESULTS

Pregnancy and lactation both affected individual liveweights. These were corrected for by covariate analysis of variance. On this basis, the supplemented sheep were heavier on three occasions: 1 July 1970, 19 August 1970 ( $P < 0.01$ ) and 22 July 1971 ( $P < 0.05$ ). The unsupplemented sheep were heavier on seven occasions: 31 October 1969, 27 November 1969, 10 February 1970, 23 April 1970, 9 June 1970, 7 June 1971 ( $P < 0.01$ ) and 26 November 1970 ( $P < 0.05$ ) (figure 1).

The reproductive data are recorded in table 1.

Unharnessed rams were detected in groups 3 and 4 for the joining period 10 July 1969 to 27 August 1969, and in group 4 for the joining period 10 May 1971 to 22 June 1971. These rams account for the differences in recorded oestrus percentages, as there were no differences in pregnancy or lactation frequencies. One unsupplemented group (group 1) had significantly fewer ( $P < 0.01$ ) lambs at lamb marking of 8 December 1971.

Ewe mortality was high; there was no significant difference between groups (table 2).

TABLE 1  
REPRODUCTIVE DATA\*

	Group 1	Group 2	Group 3	Group 4
<b>Joining 10 Jul to 27 Aug 1969</b>				
Percentage of Ewes mated .. .. .	74.9	69.7	63.4†	68.4†
Percentage of Ewes diagnosed pregnant ..	65.2	58.6	55.4	56.9
Percentage of Ewes judged wet .. .. .	53.9	48.3	48.9	54.0
Percentage of Lambs marked .. .. .	59.1	59.1	54.4	54.4
<b>Joining 12 Mar to 23 Apr 1970</b>				
Percentage of Ewes mated .. .. .	82.5	79.7	85.9	85.4
Percentage of Ewes diagnosed pregnant ..	63.0	61.8	64.4	63.0
Percentage of Ewes judged wet .. .. .	3.4	1.2	3.7	2.3
Percentage of Lambs marked .. .. .	6.7	6.6	8.6	6.6
<b>Joining 10 May to 22 Jun 1971</b>				
Percentage of Ewes mated .. .. .	82.8	86.3	95.4	41.5†
Percentage of Ewes diagnosed pregnant ..	98.2	98.3	98.4	97.3
Percentage of Lambs marked .. .. .	61.5‡	96.7	91.8	87.8

\* No ewes showed oestrus during the joining period 15 October to 26 November 1970.

† Unwanted rams were present before joining.

‡ Feral pigs were shot in the paddock containing group 1 and adjacent paddocks during lambing.

TABLE 2  
MORTALITY RATE OF EWES

	Group 1 %	Group 2 %	Group 3 %	Group 4 %
Jul 1969–Jun 1970 .. .. .	16.0	19.2	15.0	16.6
Jun 1970–Jun 1971 .. .. .	31.3	23.8	24.1	25.0
Jun 1971–Dec 1971 .. .. .	2.2	7.5	6.9	3.1
<b>TOTAL .. .. .</b>	<b>49.5</b>	<b>50.5</b>	<b>45.9</b>	<b>44.7</b>

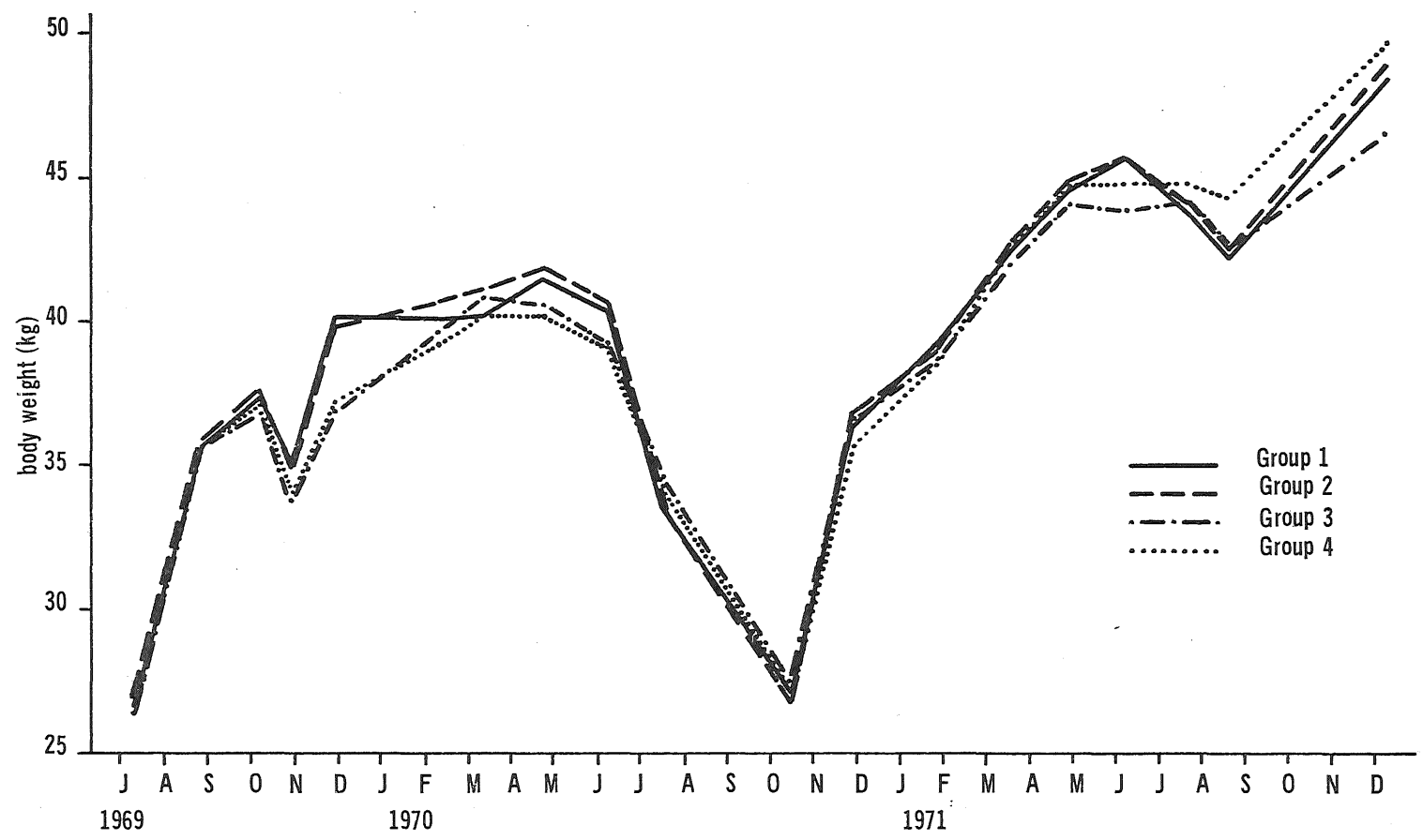


Figure 1.—Average body-weight recordings.

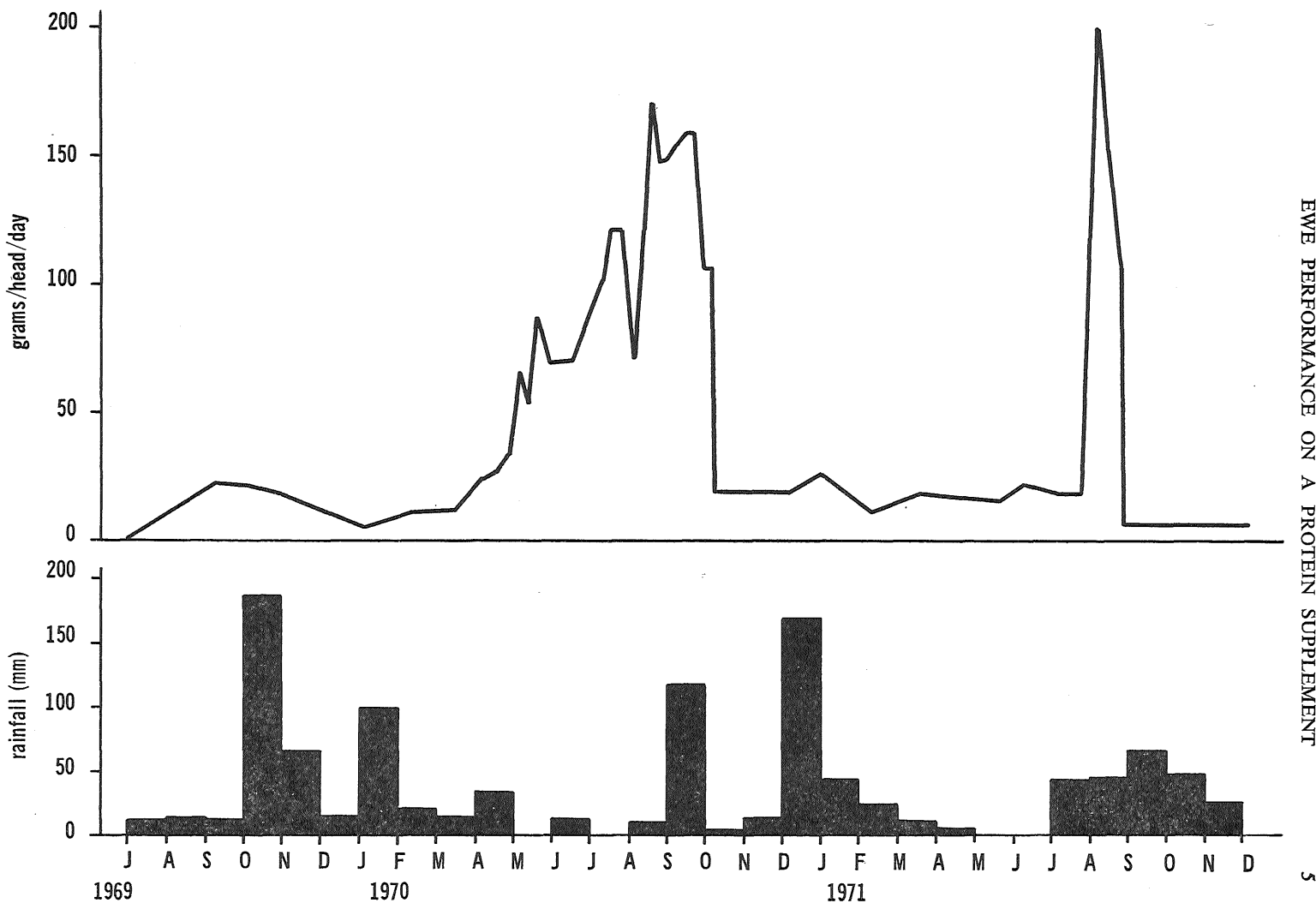


Figure 2.—Variation in supplement consumption by ewes and rainfall incidence.

Average wool production per head is shown in table 3. In 1970, the wool production of group 4 was significantly higher than the wool production of group 1 ( $P < 0.01$ ); no significant difference occurred in 1971.

Supplement consumption and rainfall are shown in figure 2. A total of 17.7 tonnes of supplement was consumed.

TABLE 3  
AVERAGE WOOL WEIGHTS

—	Group 1	Group 2	Group 3	Group 4	S.E.
Weight (kg) 1970 ..	5.06	5.17	5.18	5.21	0.04
Weight (kg) 1971 ..	4.78	4.73	4.68	4.78	0.05

#### IV. DISCUSSION

The body-weight of both groups followed the expected seasonal pattern: loss of weight in the late winter and spring when feed was scarce and green feed not available. When the available pasture was low in quantity and quality, the rate of weight loss was lower in the supplemented groups. The intake of supplement increased during these periods. Entwistle (1972) detected similar patterns in consumption and body-weight change in late spring and early summer. With the onset of storms in spring and the consequent availability of green feed, the intake of supplement declined rapidly.

The unsupplemented sheep gained more weight than the supplemented sheep did in late 1969 and early 1970 when green feed was readily available. This compensatory weight gain is similar to that reported from north Queensland by Entwistle (1972).

Supplementation had no beneficial effect on reproductive performance. This result is similar to those detected by other workers (Entwistle 1972, Entwistle and Knights 1974).

In the Roma region, 1970 was a drought year and the additional joining attempted after the drought was a failure. The ewes failed to exhibit oestrus even though there was a rapid increase in liveweight from 27 kg to 37 kg, during this period. Beasley (personal communication 1975) made similar observations in the Charleville area after the end of the 1965 drought. The low lambing percentage in group 1 in 1971 was attributed to predation by feral pigs as a number of these were destroyed during this lambing period and pregnancy rates at approximately 100 to 120 days of gestation were similar in all groups.

Because of adverse seasonal conditions in 1970, ewe mortality was high. Supplementation which reached a peak of 170 g per head per day did not significantly reduce mortality. Briggs *et al.* (1960) and McInnes and Mangelsdorf (1966) detected a decrease in mortality rate in supplemented adult sheep. The difference may be attributed to the severity of the drought in 1970.

The significant increase in wool weight produced by group 4 in 1970 was small and was not obtained with the replicate group. No significant difference occurred in 1971. This finding is similar to the results of Briggs *et al.* (1960), McInnes and Mangelsdorf (1963) and Greenwood and Lloyd Davies (1966). There was no difference between groups in the average price received per sheep when the wool was sold.

From the evidence obtained, this form of year-round supplementary feeding appears unlikely to be of value in the Roma region. The marked and rapid increase in intake of the supplement in the winter and the rapid decline when green feed is available indicates that sheep voluntarily regulate their intakes of this type of supplement in this area.

### V. ACKNOWLEDGEMENTS

We thank Messrs E. J. McCormack and Company for providing the sheep and facilities. The work was financed in part by the Australian Wool Corporation. The premix supplied by Rumevite Australia Pty Ltd was greatly appreciated. The assistance of Mr P. K. O'Rourke for statistical analysis and Miss R. Grant for technical assistance is gratefully acknowledged.

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(Received for publication 26 June 1975)

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