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THE EFFECT OF UREA-MOLASSES SUPPLEMENTATION ON LIVEWEIGHT, WOOL PRODUCTION AND REPRODUCTIVE PERFORMANCE OF MERINO EWES GRAZING POOR QUALITY NATIVE PASTURE

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SUMMARY

Urea-molasses supplementation had no effect on liveweight, growth rate, wool production or reproductive performance of sheep grazing poor quality native pastures in the Maranoa district of southern Queensland.

I. INTRODUCTION

Protein can be synthesized by the ruminal flora from non-protein nitrogen (McDonald 1968). Pen feeding studies with sheep have shown that liveweight loss can be reduced by supplementing low quality roughages with non-protein nitrogen (Clark and Quin 1951; Morris 1958; Briggs, McBarron, Grainger and Franklin 1960; Beames and Morris 1965).

The results of grazing trials using urea as a non-protein nitrogen source are, however, not conclusive (McDonald 1968). Willoughby and Axelson (1960) sprayed poor quality pasture with urea or molasses or both and noted an increase in feed consumption and a decrease in liveweight loss of sheep. Entwistle (1972), working in north-west Queensland, reported increased clean wool production but no increase in liveweight when sheep grazing dry Mitchell grass (*Astrebla* spp.) pastures were supplemented with urea. In earlier north-west Queensland work, Pierce, Moule and Jackson (1955) were unable to demonstrate any liveweight or wool growth response to thrice-weekly urea supplementation. Sheep grazing wheat stubble in Western Australia showed no response to urea supplementation (Anon 1970).

The growth rate, wool production and reproductive performance of sheep provided with an *ad libitum* supplement of urea and molasses while grazing poor quality native pastures in the Maranoa district of south-west Queensland are presented in this paper.

II. MATERIALS AND METHODS

ANIMALS. One hundred and eight, 8-month-old ewes were allocated to two groups (supplemented and control) on the basis of random selection within each of 54 liveweight pairs. The mean initial liveweight were 24·39 and 24·52 kg ± S.E. 0·68 respectively.

LOCATION AND TIME OF EXPERIMENT. The experiment was conducted in two adjoining 80 ha paddocks on a property south of Mitchell (148°E, 27° 30'S). Each paddock on visual examination appeared to be similarly vegetated with *Eucalyptus populnea* (poplar box) and *E. melanophloia* (silver-leaf ironbark), *Aristida* spp. (wire grass) and numerous forbs which emerge after rain.

The trial began on 3 July 1968 and continued for 26 months, ending on 28 August 1970.

TREATMENTS. Supplemented group—urea-molasses supplement. Control group.

Initially the urea-molasses supplement was 2·5% w/v urea in a molasses water mixture composed of molasses 54·5 kg, water 54·5 kg, urea 2·7 kg. During the first 6 weeks of the experiment, this mixture was gradually altered until it contained 5% urea (w/v) and 33% molasses (v/v) and it was offered to the supplemented group at the rate of 80 litres per week.

The mixture was fed in straight-sided troughs equipped with wooden floats to restrict intake. No measurements were made of the group intake of the urea molasses mix.

MANAGEMENT AND MEASUREMENTS. Immediately after allocation, the two groups were grazed separately and without supplement in the two trial paddocks for a 4-month adjustment period.

Throughout the experiment, the stocking rate was 1·5 ha per sheep. Thus grazing pressure increased as the trial progressed because of the growth of the sheep, pregnancy and lactation.

The groups were rotated from one paddock to the other at intervals of 2 months in an attempt to minimize paddock differences. At these times, all sheep were weighed and 14 animals from each group were dyebanded.

These dyeband samples were later clipped for clean wool production, fibre diameter, and linear rate of wool growth determinations (Chapman and Wheeler 1963).

The ewes were mated with 4% rams for a 6-week period in December 1969 to January 1970, 18 months after the start of the experiment. The rams were rotated at fortnightly intervals during mating in an attempt to minimize ram differences. Rams were equipped with harnesses and crayons (Radford, Watson and Wood 1960) and oestrus was recorded fortnightly.

Rainfall was recorded daily.

STATISTICAL ANALYSES. The liveweight and wool growth data were analysed by analysis of variance. Liveweights were corrected for initial liveweight using covariance analysis. The reproductive data were analysed by the chi square method.

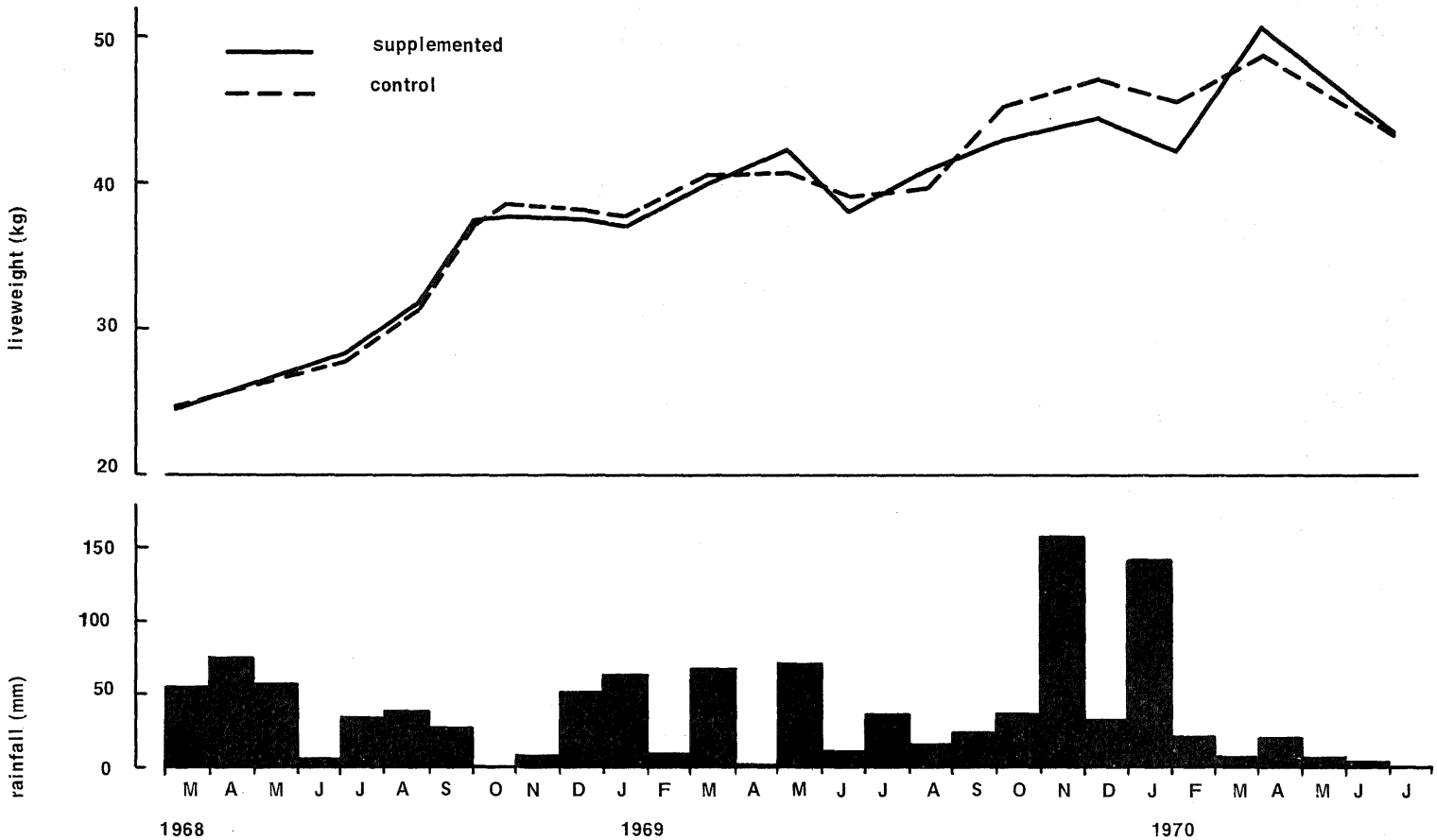

Figure 1.—Body-weight variations and rainfall recorded at trial site.

III. RESULTS

LIVEWEIGHT. No significant differences in liveweight were recorded during the first 7 months of the trial. During the period 6 May 1969 to 2 April 1970, however, there were differences in liveweight with paddock changes. The sheep coming from paddock 1 were always significantly heavier than those from paddock 2, irrespective of treatment.

Liveweights were corrected for initial liveweight and also for pregnancy during the final stages of the trial. These with rainfall data are presented in figure 1.

WOOL PRODUCTION. Urea-molasses supplementation did not influence clean wool production, fibre diameter, or linear rate of wool growth (table 1).

TABLE 1

WOOL GROWTH PARAMETER OF SUPPLEMENTED (1) AND UNSUPPLEMENTED (2) SHEEP

Date of Clipping	Fibre Diameter		S.E. of diff.	Linear Wool		S.E. of diff.	Clean Wool		S.E. of diff.
	1	2		1	2		1	2	
				cm day^{-1}			mg cm^{-2} day^{-1}		
3–7–68	19·96	19·39	0·73	..	..	..	..	..	..
20–8–68	21·18	20·27	0·73	0·284	0·279	0·008	..	..	..
1–10–68	22·42	22·19	0·73	0·309	0·318	0·008	..	..	..
14–1–69	20·14	20·59	0·76	..	..	..	..	..	..
11–3–69	21·43	20·41	0·76	0·266	0·266	0·008	1·004[a]	0·792[b]	0·055
6–5–69	21·17	20·49	0·76	0·271	0·266	0·008	0·914[a]	0·749[b]	0·055
17–6–69	18·32	19·49	0·76	0·187	0·186	0·008	0·648	0·745	0·055
12–8–69	19·48	19·51	0·76	0·270	0·255	0·008	0·896	0·936	0·055
6–10–69	20·08	21·97	0·76	0·291	0·306	0·008	0·871[b]	1·011[a]	0·058
10–12–69	21·51	22·66	0·66	..	..	..	..	.. *	..
4–2–70	22·23	22·85	0·66	0·264	0·280	0·008	1·218[b]	1·387[a]	0·058
2–4–70	21·04	21·04	0·66	0·258	0·255	0·008	1·078	1·157*	0·058
3–7–70	18·89	18·04	0·66	0·236	0·222	0·008	0·700	0·668	0·058
28–8–70	16·62	16·10	0·66	0·230	0·226	0·008	0·495	0·470	0·050

* Paddocks not changed.

Values on the same line with different superscripts are significantly different, $P < 0·05$.

REPRODUCTIVE PERFORMANCE. There were no significant differences between groups in the number of ewes served, the number of lambs marked, or the number of lambs reared. The average lamb-marking percentage was 47·7%.

IV. DISCUSSION

No biologically significant response was obtained by supplementing with urea-molasses. The reason for the lack of response is not evident. It may have been due to the type of herbage available to the sheep. Dry grass was available at most times during the experiment while forbs and herbs were also present. It is possible that the sheep selected a diet of adequate nitrogen content from the available vegetation.

All the treated animals had molasses stained muzzles and it was considered that they were eating the supplement. Considerable wastage of the supplement was encountered during the hotter months owing to fermentation in the troughs and consequent unpalatability to the sheep. Experimentation showed that a molasses to water ratio of 2:3 reduced this problem. For the above and other reasons, an attempt to estimate the intake of urea-molasses mixture was abandoned.

The unexpected changes in liveweight associated with different paddocks highlights the difficulty in detecting between-paddock differences which are likely to influence an experiment. A more frequent interchange of sheep may have minimized this effect.

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