THE EFFECT OF COTTONSEED MEAL AND UREA SUPPLEMENTATION ON THE REPRODUCTIVE PERFORMANCE OF EWES IN CENTRAL AND SOUTH WEST QUEENSLAND

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SUMMARY

On four properties in central and south west Queensland the influence of urea and cottonseed meal supplements fed to lactating ewes consuming drought affected pastures was examined. In four instances out of five, cottonseed meal supplements increased lamb marking percentages and/or lamb liveweight at marking and in one experiment it increased ewe liveweight at lamb marking. Urea supplementation increased ewe liveweight at lamb marking. Urea supplementation increased lamb liveweight at marking on one property whereas on the other it had no significant effect.

INTRODUCTION

Increased death rates in lambing ewes and depressed lamb marking percentages are commonly experienced when ewes are forced to lamb into drought affected pastures in central and south west Queensland. Results from north west Queensland (Stephenson *et al.* 1981) have demonstrated that supplementing lactating ewes that are grazing Mitchell grass pastures containing 1.2% N with 10 g/hd/d urea improves lamb growth rate and reduces lamb mortality. However, the effects of improving the protein status of ewes by providing true protein supplements have not been documented. This paper presents the results from four field trials which were conducted in central and south west Queensland during 1979 and 1980 to examine the effects of urea or various levels of cottonseed meal (CSM) supplementation on the reproductive performance of ewes grazing drought affected pastures.

MATERIALS AND METHODS

The experiments were carried out in the Blackall, Augathella, Charleville and Surat districts of central and south west Queensland. The pastures in the experimental paddocks at Augathella and Charleville were typical Mitchell grass associations while *Aristida*, *Bothriochola* and *Chloris* spp. predominated in the open woodland association at Surat. At Blackall the control, urea and CSM supplementation paddocks (see Table 1) contained Mitchell grass, Mitchell with 20% Buffel grass and Buffel grass respectively. Drought conditions prevailed on each of the study sites during the supplementary feeding periods.

Blackall

Nine hundred maiden Merino ewes were joined in March 1980, randomly allocated to three groups and placed in separate paddocks. One group was supplemented with urea through the drinking water (10 g/hd/d urea), a second was offered CSM (50 g/hd/d) and the third was an unsupplemented control. Supplementation commenced three weeks prior to lambing and continued for 13 weeks. Midway through the supplementation period, 50 ewes and their lambs from the control group got through

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the fence into the CSM treatment and stayed there until the termination of the experiment. This could have favoured the response recorded in the control group and reduced the response in the CSM treatment as the rate of CSM supplementation was not increased in response to the increased number of animals in that treatment.

Auaathella

Thirteen hundred and fifty-five mixed age Merino ewes were joined in February 1979. Two weeks prior to the start of lambing, supplementation with CSM (30 g/hd/d) and a molasses based mineral block* (10 g/hd/d) was commenced and continued for 14 weeks. A group of 895 similar but unsupplemented ewes was run in an adjoining paddock.

Charleville

A flock (1507) of mixed-age April joined Merino ewes was randomly allocated to three treatment groups in September 1979. Two groups were offered CSM supplements, one at the rate of 50 and the other at 100 g/hd/d. The supplements were offered to the sheep one week prior to start of lambing but consumption did not commence in the 100 and 50 g/hd/d treatments for a further five and seven weeks respectively.

Surat

A flock of 505 six year old April joined Merino ewes was randomly allocated to two treatment groups in mid-September 1979; one group received urea in the drinking water (10 g/hd/d) while the other was an unsupplemented control. A further 102 seven year old ewes were allocated to a third paddock and offered CSM at 100 g/hd/d. Both supplements were offered from 1 week prior to 8 weeks after the commencement of lambing.

In the experiments at Blackall and Surat, urea was supplemented via the drinking water using a granular urea dispenser (Stephenson et al. 1981). The CSM supplements were mixed with 20 to 50% salt to control intake and fed in open troughs. The molasses based mineral block fed in the Augathella experiment was placed directly on the ground. At all sites lamb marking was carried out at the end of the supplementation period. Lamb marking and survival data were analysed using the chi squared test while all other data were analysed by analysis of variance.

RESULTS

The results of all experiments are shown in Table 1. Urea supplementation significantly improved live weight of the lambs at marking at Surat but appeared to have no significant effect on any of the parameters measured at Blackall.

Ewe survival rates were not improved by feeding the combined CSM and molasses based mineral lick at Augathella or 100 g CSM/hd/d at Charleville; the survival rate in the 50 g/hd/d treatment at the latter site was lower than in the control group. Ewe liveweight at lamb marking was only improved by the CSM treatment (50 g/hd/d) at Blackall.

Lamb marking percentages were significantly improved by feeding the combined supplement at Augathella and CSM at the rate of 100 g/hd/d at Charleville. The CSM supplement fed at 100 g/hd/d improved the liveweights of the lambs at marking (Charleville and Surat) but when it was fed at the rate of 50 g/hd/d there was no improvement (Charleville and Blackall).

* Barastoc No. 2 block.

TABLE 1 The live weights (kg) of ewes pre-lambing and at lamb marking and of lambs at lamb marking together with ewe survival and lamb marking percentages

	No. of ewes	Ewe live weight pre-lambing	Ewe live weight at lamb marking	Ewe survival percentage	Lamb marking percentage	Lamb live weight at marking
Blackall, 1980						
Control	200 (1:2)†	37.9	32.9^{b*}	ND	61	11.7^{ab}
Urea, 10 g/hd/d	350 (1:1.3)	37.9	33.2^{b}	ND	49	11.3^{b}
CSM, 50 g/hd/d	350 (1:1.3)	37.9	35.4^{a}	ND	59	12.1^{a}
Augathella, 1979						
Control	895 (1:1.3)	ND††	36.1	80.5	17^{b}	7.0
CSM, 30 g/hg/d plus molasses block, 10 g/hd/d	1355 (1:1.1)	ND	36.8	86.1	34^{a}	7.4
Charleville, 1979						
Control	560 (1:2)	53.4	43.1	94.5^{a}	79^{b}	14.5^{b}
CSM, 50 g/hd/d	585 (1:2)	54.2	45.4	89.6^{b}	77^{b}	14.6^{b}
CSM, 100 g/hd/d	362 (1:2)	52.4	46.8	97.5^{a}	92^{a}	16.5^{a}
Surat, 1979						
Control	255 (1:1)	46.0	39.4	ND	71	10.1^{b}
Urea, 10 g/hd/d	250 (1:1)	46.0	38.7	ND	77	11.8^{a}
CSM, 100 g/hd/d	102 (1:1)	ND	37.4	ND	78	12.1^{a}

* For any location, values in the same coloumn with different superscripts are significantly different (P < at least 0.05)

† Stocking rate (sheep/ha)

†† ND = not determined

DISCUSSION

Even though none of the experiments in this report was replicated and comparison between experimental sites is difficult, the results indicate that supplementation with CSM enhanced reproductive performance under drought conditions; in four of the five instances where CSM was supplemented either lamb marking percent or lamb liveweight at marking was improved. Further, it has been found that the superiority of the CSM supplemented group at Blackall carried over to the weaner shearing when the lambs from this group were significantly heavier, and cut more wool than their counterparts in the other two treatments (N. O'Dempsey, unpublished data). The depressed ewe survival and the lack of response in the lambs in the 50 g/hd/d CSM treatment at Charleville may have been associated with the ewes' delayed acceptance of this supplement and/or to a paddock difference.

Urea supplementation at Surat produced similar results to those obtained with CSM fed at 100 g/hd/d while at Blackall there was no response to the urea. This latter result may have been associated with the difference in stocking rates in the control and urea supplemented paddocks or, what is more likely, indicated that at this site dietary N concentrations were not low enough to permit a response to supplemented non protein nitrogen.

These experiments give no indication whether the effects of urea and CSM supplementation are additive. Theoretically they should be as urea supplementation should increase the flow of microbial protein from the rumen (Ørskov 1977), while the mechanically extracted CSM, which is apparently largely undergraded in the rumen (McMeniman et al. 1981) should supply additional protein that could be absorbed in the small intestines and further stimulate lactation (Robinson et al. 1979). Work is continuing in this area. Until this information is available however, decisions as to whether to use protein or NPN supplementation will be influenced by the availability and cost of suitable protein sources and the practicality of and dangers associated with urea supplementation.

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