A Trial to Determine the Economic Viability of a Commercial Lick Block

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"Ruby Hills", Walcha N.S.W.

INTRODUCTION

The accurate diagnosis of diseases caused by mineral deficiencies in sheep, involving production losses rather than clinical symptoms is extremely difficult requiring a knowledge of local geology and analyses of plant and animal tissue[1]. Even then it is difficult to determine the appropriate levels of minerals required to correct a problem[2]. Some areas of Australia (e.g. the New England region in N.S.W.) have blood and animal tissue deficiencies of the minerals selenium and copper[3,4] that are related to local geology[5]. Wool production, liveweight and reproductive performance improvements have been achieved with the addition of selenium[6].

The diagnosis of production loss diseases may be achieved by a production response trial to measure response to the introduction of suspected deficient minerals[1]. In the New England region selenium is deficient and has long been administered to livestock on the property where this trial occurred[3,5,7], but the importance of some other mineral additives is not known.

Thus the aim of this experiment was to determine whether a trace element lick block had any effect on (i) production and (ii) profitability of wethers grazing under ideal conditions in the New England area of N.S.W.

Individual consumption of supplements may vary[8,9,10], however a lick block was selected as the best means to administer minerals for these reasons: (i) flock response (rather than individual treatment) is likely to be economically important, and (ii) lick blocks are commercially available. In this trial, a customised version of a standard block was used. The trial was therefore a production response trial which used a "shotgun" mixture to determine whether a commercially useful improvement in performance was achievable using readily available materials.

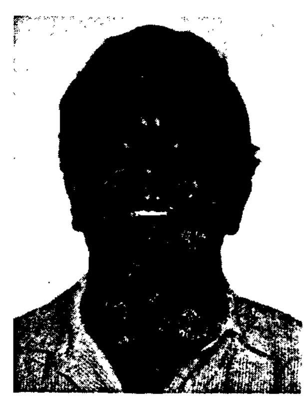
DESIGN AND METHODS

The trial was conducted at "Venter Fair" near Walcha, N.S.W.

The site had been extensively subdivided and sown to provide a dense sward of Demeter Fescue and a mixture of Subterranean and White clovers. During the period of the trial, from September 1988 to August 1989, rainfall was 820 mm, and winter was relatively mild[11] with adequate feed available throughout the season. Phosphate history was limited to 125 Kg single super/ha. in each year for three years prior to the trial.

Four paddocks were set aside for the trial, each with the same source of underground water. Two paddocks were allocated to treatment (T) and two to control (C). The areas of each were: "Jacks" (C) 10.7 ha; "Nut" (T) 12.8 ha; "Long" (T) 10.9 ha; and "Air Strip" (C) 18.4 ha.

Three-year old wethers were drawn from the "Ruby Hills" flock (mean fibre diameter adult fleece wools over last 5 years: 19.7 microns) for the trial. They were under a modified "Wormkill" drench regime, had been treated previously with selenium pellets and had re-



ceived identical treatment for sheath rot. The wethers were shorn in September 1988, identified with numbered eartags, and randomly allocated to each of the four groups. Stocking rate was 7.5/ha. Numbers were: Jacks (C) 81; Nut (T) 95; Long (T) 81; Airstrip (C) 137, totalling 394.

The blocks were prepared as follows: Common Salt 24%, Lime 16%, Bentonite 30%, Christmas Island Phosphate 10%, Molasses 8%, Magnesium Sulphate 4%, Manganese Sulphate 0.04%, Copper Sulphate 1.0%, Cobalt Sulphate 0.02%, Potassium Iodide 0.06%, Zinc Oxide 0.1%, Vitamin A 60000 I.U./kg, Vitamin E 40 I.U./kg, Vitamin D3 50000 I.U./kg, Potassium Sulphate 1.0%, Iron Oxide 1.2%, Balance 4.6% grass seed and carrier. No selenium was included as the sheep had each received selenium pellets prior to commencement of the trial. These blocks were supplied to the sheep on an adlibitum basis at various points around the paddock from 12/10/1988 until 8/08/1989.

Table 1.

Mean (i) Fleeceweights (Kg.) by Group

QUALITY	Treatment Long	Treatment Nut	Control Airstrip	Control Jacks	Mean
AA	4.73	4.58	5.50	5.15	4.88
AA Com M	5.48	5.74	5.42	5.56	5.56
AAA	5.06	5.39	5.31	5.15	5.27
AAA Com	5.78	5.59	5.48	5.74	5.61
Sup AAA	4.99	4.56	5.19	5.02	4.91
Sup AAA M	5.16	5.31	5.31	5.17	5.25
No Record	5.98	5.95	5.16	5.55	5.53
Mean:(kg)	5.35	5.44	5.35	5.44	5.39

(i) Means weighted according to numbers of individuals represented in each cell.

Table 2.

Allocations to Quality Groups as Percentage by Weight

QUALITY	Treatment Long	Treatment Nut	Control Airstrip	Control Jacks
AA	2.3%	1.8%	0.7%	1.3%
AA Com M	9.3%	12.5%	8.1%	16.4%
AAA	12.3%	17.1%	15.9%	7.6%
AAA Com	53.4%	44.2%	50.8%	47.8%
Sup AAA	6.1%	6.3%	4.2%	3.7%
Sup AAA M	13.8%	15.8%	16.6%	16.5%
No Record	2.9%	2.4%	3.5%	6.8%
Total:	100.0%	100.0%	100.0%	100.0%

Table 3.

Mean (ii) Fleece Values in Dollars

QUALITY	Treatment Long	Treatment Nut	Control Airstrip	Control Jacks	Mean
AA	58.36	56.50	67.93	63.60	60.21
AA Com M	59.82	62.69	59.22	60.74	60.70
AAA	66.04	70.35	69.25	67.21	68.76
AAA Com	61.88	59.76	58.61	61.37	60.08
Sup AAA	65.37	59.80	68.02	65.72	64.32
Sup AAA M	63.46	65.36	65.30	63.63	64.64
No Record	65.73	65.45	56.76	61.05	60.81
Mean: ($)	62.72	62.89	61.93	62.32	62.40

(ii) Means weighted according to numbers of individuals represented in each cell.

RESULTS

Sheep Weight

On 7/9/88 the sheep were identified by tag number and weighed using electronic scales incorporating a data collection facility. They were then placed in their allotted paddocks. Initial liveweight was recorded to ensure that no detectable bias had been incorporated in the paddock allocations.

Average initial bodyweights (kg) were:

Treatment		Control	
Nut	Long	Jacks	Air Strip
54.6	52.9	54.3	54.5

There were no significant differences between these groups (F =2.5; 3,390 df) (12).

At the end of the New England growing season the sheep were reweighed (on 10/04/89), as follows:

Treatment		Control	
Nut	Long	Jacks	Air Strip
68.3	66.9	67.8	67.8

Again there were no significant differences between the groups (F=0.96; 3,383 df). The mean weight gain among groups was also non significant (F = 2.5, 3,381 df).

Wool

The sheep were shorn randomly on 10/8/89 and 11/8/89. Unskirted fleece weights and the bins into which each fleece was classed were recorded. An independent classer was employed who had significant experience with fine wools. For the purposes of this trial it would have been economically impractical to have tested each fleece for fibre diameter so we have relied upon the classer's ability to determine major quality differences between fleeces. The following policy was used: (mean fibre diameter (microns) and Schlumberger Dry Yield of these lines appear in parentheses).

AAA =	long and stylish (19.6, 79%);
Sup AAA =	long and fine (19.4, 78%);
Sup AAA M =	creamy line from AAA and Sup AAA (19.8, 79%);
AA=	short and fine (19.4, 75.4%);
AAA Com =	long and brood (20.6, 80%);
AA Com M =	cast (20.1, 76.8%);

The value of each fleece was derived by applying the greasy price to the whole fleece.

Tables 1, 2, and 3 indicate that there were no large differences between the treatment and control groups. The data contained in Table 1 indicate that there were no differences between the groups regarding gross fleece weights. However it is possible that the treatment could have affected the way fleeces were allocated to quality groups (e.g. by an improvement in colour).

Table 2 indicates that there was a very slight movement from lower quality wools to more stylish types in the treatment groups. This appears to be due to an improvement in colour (e.g. the percentages classed into Sup AAA M and AA Com M were less for the treatment than control groups). Likewise the Sup AAA and AAA percentages were slightly higher for the treatment groups, but these differences were small and raise the question: is there any economic advantage from such a result?

Table 3 indicates that the suspected improvement in quality had a gross increase in fleece value of 72c/head. However a 1-way analysis of variance on individual dollar values found no significant differences between the groups (F= 0.28; 3,374 df). Such an improvement could be a consequence of chance as well as of nutrition.

Likewise, if the numbers of fleeces allocated to bright as opposed to creamy lines are examined, 74% of treatment fleeces went to the bright bins as compared to 73% of control fleeces, showing no detectable difference.

Costs

The cost of the blocks can be calculated as follows: $700/tonne x 0.45 tonne consumed = $315. 176 sheep were involved in the treatment giving a cost of materials at $1.78 per head. Disregarding labour costs there was a net loss of $1.06 (i.e. improvement in fleece value less cost of materials).

CONCLUSION

The use of this formulation of salt lick block for wethers grazing in ideal conditions on this property was not indicated. Nevertheless, it could be a matter for further research to determine whether such a result may be of some larger significance in a breeding enterprise or under adverse conditions such as drought.

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