

final report

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Mineral Worm Control

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Abstract

This producer research site sought to evaluate the efficacy of oral mineral supplement (OMS[™]) for worm control in prime lambs. Two sites ran control and treated mobs. The dry season encountered on property one resulted in low worm burdens and led to the mobs being combined to manage supplementary feeding. There were no significant differences in live weight. Property two experienced a better season resulting in higher worm burdens. The growth rates of the OMS treated mob was significantly higher that the control mob. However, it must be noted that the control mob were un-drenched providing no comparison with a standard worm management program. The OMS drench is mineral based so it may influence animal productivity by addressing a subclinical mineral deficiency. With one year's data from two sites the impact of OMS is inclusive; however, the host producers' were sufficiently interested to continue to the trial the product.

Project Objective

To evaluate the efficacy of oral mineral supplement (OMS[™]) for worm control in prime lambs.

Methodology

The project commenced with drenching the ewe mob, from which the lambs for the treatment group were to be derived, immediately prior to lambing with the mineral treatment known as Oral Mineral Supplement (OMS[™]). Each co-operator then applied distinguishing ear tags to at least 100 lambs at random to form the treatment group and similarly to at least 100 lambs to form the control group. The treatment group subsequently received 3 drenches with OMS at bimonthly intervals commencing at lamb marking 6 weeks after lambing. The control group was drenched according to normal practice on the property based on worm egg count (WEC) results. August drop Merino ewe lambs were used in the trial on property 1 and May drop crossbred mixed sex lambs were used on property 2.

Property 1 was located near Langkoop on the SA/Vic border south east of Naracoorte. Here the control and treatment groups were run together due to severe feed shortage. Property 2 was located near Beachport in the mid south east of SA and the control and treatment groups were run separately. All other animal health treatments, supplements and management procedures were the same for both groups for the duration of the study. Worm egg counts and body weights for each group were monitored bi-monthly from August until May. The study was originally intended to run for 2 years on six properties, but delays in importing the OMS from New Zealand; a sequence of dry years leading to low WEC results; and difficulty in finding co-operators lead to the inclusion of only two properties for 1 year of complete results in the trial.

Results

Property 1:

Date	Group ID	Procedure	Body Weight (kg)	WEC (eggs/gm faeces)
6/8/08	Treatment	OMS drench to ewes pre- lambing	-	-
	Control	Cydectin drench to ewes pre-lambing	-	-
3/11/08	Treatment	OMS drench lambs at lamb marking	17.3	-
	Control	No drench to lambs at lamb marking	17.7	-
18/12/08	Treatment	OMS drench at weaning	21.0	0 T/O, 0 N
	Control	No drench at weaning	22.0	10 T/O, 20 N
6/3/09	Treatment	Weigh & WEC	26.2	20 N
	Control	Weigh & WEC	26.9	110 N
27/5/09	Treatment	Weigh & WEC	29.2	30 T/O, 40 N
	Control	Weigh & WEC	29.8	10 T/O, 30 N
Weight gain	Treatment	11.9 kg / 205 days	58 g/d	ns*
Weight gain	Control	12.1 kg / 205 days	59 g/d	ns*

T/O = Trichostrongylus spp &/or Ostertagia spp of internal parasites

N = Nematodirus spp of internal parasites

* Difference not significant

Property 2:

All lambs received a lupin supplement @ 50g/head/day from 20 January & ad lib hay supplement from 16 February due to a feed shortage on offer in the paddock.

Date	Group ID	Procedure	Body Weight (kg)	WEC (eggs/gm faeces)
23/8/08	Treatment	WEC	-	640 T/O, 70 N
	Control	WEC	-	1040 T/O, 130 N
13/10/08	Treatment	OMS drench	-	-
	Control	No drench	-	-
27/11/08	Treatment	Shorn + OMS drench	32.2	280 T/O, 20 N
	Control	Shorn + no drench	34.9	290 T/0, 10 N
9/1/09	Treatment	WEC	-	330 T/O, 20 N
	Control	WEC	-	180 T/O
19/2/09	Treatment	OMS drench	40.7	400 T/O, 40 N
	Control	No drench	43.7	300 T/O, 20 N
4/5/09	Treatment	Weigh & WEC	45.4	50 T/O
	Control	Weigh & WEC	44.2	310 T/O
Weight gain	Treatment	13.2 kg / 158 days	84 g/d	***
Weight gain	Control	9.3 kg / 158 days	59 g/d	***

T/O = Trichostrongylus spp &/or Ostertagia spp of internal parasites;

N = Nematodirus spp of internal parasites.

*** Difference statistically significant

No supplements or other animal health treatments were given to lambs during the trial. The control lambs were not drenched on this property as the lambs are sold as organic.



Graph 1: Property 1 - Drench time and lamb body weight (kg) with worm egg count (WEC as eggs / g faeces) for Control and Treatment groups in 2008-09.

Graph 2: Property 2 - Drench time and lamb body weight (kg) with worm egg count (WEC as eggs / g faeces) for Control and Treatment groups in 2008-09.



Discussion

The effect of improved parasite control and enhanced disease resistance, combined with reduced chemical costs and drench resistance has wide spread potential benefit for all lamb producers. Similarly, the opportunity for improved growth rates and earlier turnoff of lambs may have a large impact on the profitability of all lamb producers. Access to the organic lamb market would be especially beneficial to the producers who seek the predicted \$1/kg live weight premium for the estimated market of 50,000 organic lambs annually in Australia. The opportunity for improved worm control without the need or reduced need for synthetic chemical treatments to control worms, as well as reduced drench resistance, would be hugely beneficial across Australia and overseas.

The results of this study on property 1 reveal relatively low worm egg counts (WEC) in both the control and treatment groups for the duration of the trial. This was a result of three sequential dry years limiting the opportunity for worm burdens to develop in the sheep flock and so pastures remained remarkably uncontaminated or relatively worm free. The treatment and control groups were run together due to the prolonged need for hand feeding and the shortage of paddock feed limiting the number of paddocks available for the trial. The very low pasture contamination meant that the co-grazing of the two groups had negligible impact on the trial result as neither group had high enough WECs to have cross contaminated each other. While the WEC did rise toward the end of the sampling period it was still less than the minimum of 100 epg considered necessary before a conventional drenching program would be instigated to control the rising worm burden.

The similarity or lack of significant difference in the body weights and weight gain between the lambs in the control and treatment groups most likely reflects the same supplementary feeding regime rather than the minor difference in WECs between the two groups. The need to hand feed the lambs for an extended period due to the feed shortage is likely to have masked any potential impact that the OMS drench had on the limited worm burdens in this trial.

The results on property 2 contrast markedly to those on property 1 and reveal significant worm burdens during the 5 month study. This outcome is most likely a product of both better seasonal conditions in this area and the absence of worm drenching in the control group due to the desire to produce organic lamb. The fall in worm burdens between August and November without treatment most likely reflect the health and nutrition of these lambs allowing their immune system to limit worm development in their gut. The OMS treatment appears to have influenced the worm burden by May when the lambs have reached 12 months of age. However, a longer term study with more properties involved would be necessary to evaluate this observation further.

Body weights were significantly different between the treatment and control groups on property 2 further supporting the observation that the OMS treatment had a marked benefit on worm control. This equated to a 25 g/day difference in weight gain over a 5 month period between the control group receiving no worm control and the treatment group receiving three OMS treatments at bimonthly intervals. As the OMS treatment is essentially a mineral drench, it is postulated that the improved worm control apparently afforded by this treatment is at least partially in response to better mineral nutrition in the treated lamb. A more detailed study including monitoring trace element nutrition in the treated lambs would be required to investigate this further.

The two properties that participated in this trial were satisfied with the outcome and stimulated to pursue the use of OMS further. Both participants were particularly frustrated by the difficulty in using the OMS due to its propensity to clog the specially provided drench gun. Despite thorough

mixing of the solution it still caused numerous blockages to drench guns to the extent that the start of the trial had to be delayed on property 2 until another drench gun and OMS was supplied. These observations have been conveyed back to the New Zealand manufacturer.

The improved growth rate on property 2 with the use of OMS has encouraged the co-operator to trial the OMS again in next season's lambs to see if similar results can be achieved. It has the potential to provide a substantial improvement in growth rate and hence profit – especially in an organic lamb enterprise. Improved weight gain of 25 g/d in this trial has the potential on average to finish lambs at least 20 days earlier providing greater marketing opportunity and reduced costs. In contrast, the outcome on property 1 was that lambs were grown organically using OMS without any sacrifice in weight gain or extra cost. However, it would be desirable to repeat this trial when conditions are more favourable for worm burdens to develop and supplementary feeding is much reduced. The co-operator is keen to try this drench under these more testing and realistic conditions.

The limited duration and number of participants in this trial meant that the specific outcomes originally set down were only partially achieved. They were:

- Improved internal parasite control in sheep through mineral supplementation and organic treatments;
- Increased lamb production through improved immunity and disease resistance;
- Development of best practise for organic lamb production;
- Reduction in drench resistance and chemical usage for internal parasite control; and
- More profitable lamb production through reduced chemical costs and improved growth rates.

However, the results were sufficiently encouraging to prompt the two co-operators to repeat the trial again in the following year's lambs.

Interim findings from this study were presented to the wider member group known as the Mid South East Beef & Lamb group during 2008-09. The full findings are to be presented at their next meeting in late July 2009. It is anticipated that other producers in this group will be encouraged to try OMS as an option for worm control in their lambs this coming spring allowing wider evaluation of the product. Once wider evaluation has been achieved, the opportunity to advise the wider farming community about this product can be undertaken.

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