OPTIMUM PRODUCTION FROM PARASITE CONTROL

GROSS MARGINS IN A MERINO WEANER SHEEP ENTERPRISE WITH DIFFERENT LEVELS OF PARASITE CONTROL

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Summary

Experiments were conducted to determine the economic justification for various levels of internal parasite control in weaner sheep in the Western District of Victoria.

In 1972, four-groups each of 100 weaners in four replicates of 25 sheep were grazed on. rye grass/white clover pasture at 16 per hectare and given four different parasite control programmes: "suppressive" (11 treatments with thiabendazole); "preventive" (3 treatments); "curative" (3 treatments); and "salvage" (individuals drenched to prevent death).

Greasy wool weights and midside samples for objective appraisal were obtained from each sheep and gross returns calculated on the basis of yield, AWC type and minimum reserve prices for 1975. Variable costs including a labour component for mustering and drenching, were deducted to provide the gross margin per sheep for each programme. The gross margin per sheep widened as the level of parasite control increased to the maximum programme used.

1. INTRODUCTION

The loss of production which results from the acquisition and presence of a parasite population in sheep has seldom been adequately measured either in physical terms of wool production or in financial returns per sheep or per hectare. Most estimates have beenbased on observations in which sheep have been treated with anthelmintics to remove parasite populations but then grazed on the same pasture with untreated sheep. In this circumstance of continuing cross infection, the damage caused in the interval between drenches still operates in both treated and untreated sheep, and treated sheep are unable to fully express their production potential. The effect of cross infection when separate paddocks are not used can be inferred from the observations of Donald (1974) who has demonstrated the decreased production which occurs in lambs weaned onto "contaminated" pastures.

For many years, authorities recommended a regular annual schedule of preventive drenches (Gordon, 1948), usually anticipating periods of maximum parasite challenge. More recently, Butler (1967) has advocated preventive treatments during the dry season when reinfection is at its lowest. Graziers, however, have sometimes preferred to defer drenching until parasite disease becomes apparent and this "curative' approach has been advocated by Cole (1967).

The primary objective of these experiments was to test these alternative strategies, in an applied situation, over a full year of production, with particular reference to wool production.

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II. MATERIALS AND METHODS

An experiment was conducted on Clover Park, the Applied Rural Research Station of Merck Sharp and Dohme (Australia) Pty. Limited, near Hamilton in the Western District of Victoria. Five to seven month old fine woolled Merino wethers were randomised on live weight rank order to 16 paddocks of 1.56 hectares.

(a) Experimental Design

In February 1972, four paddocks of 25 sheep were allocated to each of four parasite control programmes based on the broad spectrum thiabendazole, designated as:

SUPPRESSIVE - Eleven drenches given monthly
PREVENTIVE - Three drenches given on a preplanned calendar basis in January, July and September
CURATIVE - Treatments given when there was visual evidence of a parasite effect. Three drenches were given in April, July and October
SALVAGE - Only individual sheep were treated to avert death.

(b) Management and Measurements

Except for the parasite control programme, all sheep were managed in exactly the'same way. They were all crutched and vaccinated once, jetted or hand treated with diazinon when appropriate and given two injections of testosterone paste in autumn and spring to prevent sheath rot disease. When deaths occurred, replacement sheep were added in order to maintain the same grazing pressure.

At shearing, greasy weights of individual fleeces were recorded. Individual midside samples were taken to determine yield, fibre diameter, staple length, tenderness and for classification of each fleece into Australian Wool Corporation (AWC) types. The wool recovered from skirtings, pieces and belly wool was aggregated separately on a replicate basis and weighed, and a sample used to determine yield and AWC type.

Live weights and parasitological data were collected at monthly intervals but do not relate specifically to this paper.

(c) Income

From the gross income from wool based on 1975 AWC minimum reserve prices for the several components of the total fleece, selling costs at 23 cents per kg including the wool levy and freight to store at $2-00 per bale were deducted to give a return for wool at the farm gate.

(d) Costs (1975 Rates)

-Materials:

Medicines, etc. were costed on the recommended retail price.

-Labour:

Opinions in relation to costing labour vary from the situation where permanent labour is regarded as a resource available for use on all farm tasks and therefore an overhead cost, to the situation where all labour is considered a variable cost. In this study, labour has been costed in two components, viz., mustering and treatment. Mustering, when associated with a treatment not carried out at shearing, crutching, weaning, etc., was costed at two cents per head, while the labour for each anthelmintic and disease prevention treatment was costed at one cent per head.

-Deaths:

The penalty for deaths varies in relation to the type of enterprise. The management practice assumed in this case is one retaining, after classing each year, a complement of weaners to maintain the wether flock and selling the rejects. In this system, deaths result in a smaller number of reject weaners and hence a loss of income. This loss was brought to account at $5-00 per head.

III. RESULTS

Wool production, mortalities and gross wool value resulting from the four parasite control programmes are shown in Table 1.

TABLE1
Deaths, wool production and wool value in 1972

	Parasite Control Programme			
	Suppressive	Preventive	Curative	Salvage
Initial sheep	100	100	100	100
Deaths to shearing	1	4	9	18
Wool cut per head (kg)	3.59	3.11	2.90	2.46
Gross wool value per sheep shorn ($)	6.92	5.81	5.40	4.86

The items brought to account in calculating the gross margin per head based on initial numbers are shown in Table 2.

TABLE 2
Gross margin analysis ($), 1972

	Parasite Control Programme			
	Suppressive	Preventive	Curative	Salvage
Income				
Gross wool value	6.85	5.58	4.92	3.98
Less selling costs	0.82	0.69	0.61	0.46
Less freight	0.05	0.04	0.04	0.03
Wool receipts: farm gate	5.98	4.85	4.27	3.49
Variable costs				
Materials - thiabendazole	0.46	0.12	0.13	0.01
vaccine	0.05	0.05	0.05	0.05
testosterone	0.28	0.27	0.27	0.26
diazinon	0.01	0.01	0.01	0.01
wool packs, etc.	0.06	0.06	0.04	0.04
Total materials	0.86	0.51	0.50	0.37
Labour - shear, crutch	1.39	1.35	1.29	1.18
drench	0.27	0.05	0.07	0.01
disease prevention	0.04	0.04	0.04	0.04
dag	-	0.03	0.02	0.08
Total labour	1.70	1.47	1.42	1.31
Deaths	0.05	0.20	0.45	0.90
Total variable costs	2.61	2.18	2.37	2.58
Gross margin	3.37	2.67	1.90	0.91

IV. DISCUSSION

In the 1972 year, gross wool production and wool returns per sheep decreased with decreasing levels of anthelmintic usage and at 1975 wool values, this loss in production was valued at $2.06 when no parasite control was adopted.

One of the original objectives of the experiment was to compare the efficacy of preventive versus curative drenching of weaner sheep on an economic basis. The more intensive suppressive programme of monthly treatment was introduced to demonstrate the maximum potential of the weaners and to indicate the loss of production which could occur from parasite damage. The results have shown that the gross margin between increased returns and additional costs was still widening when the suppressive programme was applied at a stocking intensity of 16 Merino weaners per hectare.

The cost of drench increased from 0.05 to 17.7%, while the cost of deaths declined from 34 to 2% of total costs. Deaths were the most sensitive component of the cost structure and labour for drenching did not show up dramatically compared with labour for shearing or crutching. Under the conditions of this trial, a monthly treatment programme was economically sound.

The differences between programmes were marked and reflect the increase in production which is possible in field experiments where cross infection between treated and untreated sheep is avoided. Also the trial emphasises the importance of avoiding deaths and hence questions the economic viability of programmes which permit mortalities to occur.

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