

## New Zealand Society of Animal Production online archive

This paper is from the New Zealand Society for Animal Production online archive. NZSAP holds a regular annual conference in June or July each year for the presentation of technical and applied topics in animal production. NZSAP plays an important role as a forum fostering research in all areas of animal production including production systems, nutrition, meat science, animal welfare, wool science, animal breeding and genetics.

An invitation is extended to all those involved in the field of animal production to apply for membership of the New Zealand Society of Animal Production at our website [www.nzsap.org.nz](http://www.nzsap.org.nz)

[View All Proceedings](#)

[Next Conference](#)

[Join NZSAP](#)

The New Zealand Society of Animal Production in publishing the conference proceedings is engaged in disseminating information, not rendering professional advice or services. The views expressed herein do not necessarily represent the views of the New Zealand Society of Animal Production and the New Zealand Society of Animal Production expressly disclaims any form of liability with respect to anything done or omitted to be done in reliance upon the contents of these proceedings.

This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](http://creativecommons.org/licenses/by-nc-nd/4.0/).



You are free to:

**Share**— copy and redistribute the material in any medium or format

Under the following terms:

**Attribution** — You must give [appropriate credit](#), provide a link to the license, and [indicate if changes were made](#). You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

**NonCommercial** — You may not use the material for [commercial purposes](#).

**NoDerivatives** — If you [remix, transform, or build upon](#) the material, you may not distribute the modified material.

<http://creativecommons.org.nz/licences/licences-explained/>

# THE N.Z.S.A.P. STUDY GROUP ON INTERNAL PARASITES AND ANIMAL PRODUCTION

R. V. BRUNSDON

*Wallaceville Animal Research Centre, Upper Hut*

## SUMMARY

Apart from specific recommendations for control of the various internal parasites occurring in sheep and cattle in New Zealand, the overall conclusions of the Study Group are:

- (1) At present, internal parasites remain a very important source of production loss affecting the sheep and cattle industries.
- (2) There is considerable scope for improvement in both the effectiveness and economy of anthelmintic usage.
- (3) On the basis of recent knowledge of the epidemiology of infections, the time is now opportune for a reorientation of the approach to parasite control—*i.e.*, a change from an almost singular dependence on anthelmintic treatment to an integrated system in which a more limited use of anthelmintics is associated with planned stock and pasture management.

In present circumstances, progress towards more efficient parasite control will depend on a clearer understanding by farmers and their advisers of the seasonal patterns of parasite infections and the reasons for their occurrence. It is the hope of the Study Group that the information contained in the published report will assist in achieving this understanding.

## INTRODUCTION

Despite an annual expenditure of some \$12 million on anthelmintics in New Zealand, internal parasites—helminths or worms—remain an important source of production loss in the sheep and cattle industries. The purpose of this paper is to introduce the report of a Study Group established in 1973 to consider the problem.

The Management Committee of the New Zealand Society of Animal Production had been concerned at the apparently conflicting advice on parasite control given to farmers by various agencies—*e.g.*, Ministry of Agriculture and Fisheries, anthelmintic manufacturers, veterinary practitioners, and farm advisers. Accordingly, it invited a group of specialists to consider the whole problem of parasite control and make recommendations.

The specific objectives of the Study Group were:

- (1) To collect and collate information on patterns of infection and on the economic significance of internal parasites of sheep and cattle.
- (2) To review current recommendations and practices for the control of these parasites.
- (3) To show how present knowledge can be utilized in the formulation of more appropriate control programmes.

In addition to published work, the Study Group assembled considerable unpublished trial data. In all, the results of more than 360 anthelmintic trials with sheep, and more than 100 trials with cattle were evaluated, together with recent findings on the epidemiology of the various parasite infections.

At the outset, it was obvious that it would not be possible to make recommendations for all systems of managing sheep and cattle. However, it is hoped that the published report will provide sufficient basic information to enable advisers and farmers to develop suitable control programmes for particular situations. Among the background topics covered are the distribution of parasites, life-cycles, how parasites damage their hosts, how hosts resist their parasites, factors predisposing parasitic disease, the biology of the free-living stages and the influence of climate on seasonal patterns of occurrence.

This report is intended to outline the study group's recommendations and emphasize some of the more important principles of control. The data supporting each of the recommendations, and the exceptions to these, are summarized in the Society's *Occasional Publication No. 4*.

#### GENERAL CONSIDERATIONS

At this point it is appropriate to emphasize the objective of parasite control procedures. Eradication is not practical. Rather, the aim is to maintain parasite populations at levels compatible with economic production.

At present, most parasite control is based exclusively on anthelmintic drugs. Regular anthelmintic treatment (notably monthly drenching of young stock) will usually benefit production and afford protection against serious disease. However, this approach is neither the most effective nor the most economic method of control. While infection rates are low, the anthelmintic is largely wasted: on the other hand, if herbage infestation has risen to a high level, animals will ingest larvae in large numbers and periodic

treatment will only reduce production losses, not eliminate them. Furthermore, if animals are returned to heavily infected pasture after treatment much of the advantage of drenching may be lost. In the control of parasitic disease, prevention is more effective than cure.

In order to achieve rational parasite control it is necessary to understand:

- (1) The seasonal patterns of infection and the reasons for their occurrence.
- (2) How parasites affect the productivity of hosts.
- (3) The economic significance of parasites on farm production.
- (4) The level of control that is both desirable and practicable.

Potentially, the most efficient control can be achieved by integrating *limited* anthelmintic treatments with pasture and grazing management. This can be approached in two ways:

- (1) Whenever possible, by preventing the build-up of dangerous numbers of larvae on pasture.
- (2) By anticipating those periods when large numbers of larvae are likely to occur; at such times animals may be removed from the heavily infected pasture or protected by other measures.

This concept is by no means new but has recently been given greater impetus by advances in the epidemiology of parasite infections and by the improved efficacy of the new, broad-spectrum anthelmintics.

#### TREATMENT RESPONSES

Trial data showed that specific anthelmintic treatment responses can be grouped into three categories:

- (1) Consistent and economically worth while—*e.g.*, a three-drench programme for hoggets.
- (2) Relatively consistent but of doubtful economic importance except in particular instances—*e.g.*, drenching of lambs before and at weaning.
- (3) Inconsistent, but occasionally of economic importance—*e.g.*, pre-lambing drenching of ewes.

It is on these terms, and in the light of advances in understanding of the epidemiology of infections, that broad recommendations have been made by the Study Group. The recommendations also take cognizance of the fact that much of the initial advantage in

TABLE 1: SUMMARY OF RECOMMENDATIONS FOR DRENCHING SCHEDULES IN THE ABSENCE OF CONTROL BY GRAZING MANAGEMENT.

SHEEP		
Lamb/hoggets:		
For gastro-intestinal nematodes	Before weaning	<b>No drench.</b>
	At weaning	<b>No drench.</b>
	After weaning	<b>Three drenches</b> at 4-6 weekly intervals commencing in February.
For lungworm		<b>No drench.</b>
For tapeworm		<b>No drench.</b>
Ewes:		
For gastro-intestinal nematodes	Pre-tupping	<b>No definite</b> recommendation.
	Pre- or post-lambing	<b>No drench.</b>
For liver fluke		Where known to occur <b>treat ewes once</b> in June/July. (Where problem regularly occurs give up to three treatments between March and June.)
CATTLE		
Dairy replacement calves:		
(a) Spring-born calves		<b>Drench in January and three times</b> thereafter at 4-6 week intervals <b>starting in March.</b>
(b) Autumn-born calves		<b>Four drenches</b> at monthly intervals starting one month after being placed on pasture. <b>Note:</b> Spring-born calves in "town supply herds" rearing both spring and autumn-born calves may require an additional drench in November/December.
Intensively reared beef and dairy beef		<b>As for the above;</b> greater frequency may be necessary in highly intensive systems.
Adult dairy cattle		<b>No drench.</b>
Extensively reared beef		<b>Drench once</b> in April/May and <b>again</b> in July/August. No drench if gaining weight satisfactorily.
For lungworm		<b>Treatment at first symptoms.</b>
For liver fluke		<b>No treatment</b> unless liver fluke has been identified as the cause of disease or production loss.
For tapeworm		<b>No drench.</b>

liveweight response to intensive drenching of young animals may be temporary. Trial results indicate that losses of liveweight caused by parasites are often recovered by compensatory growth in the following season.

When assessing the benefits of parasite control, it must be remembered that the economics of a response depend on the current value of animal products and the cost of control measures. The return on investment in a control programme will fluctuate therefore with market values.

### RECOMMENDATIONS FOR CONTROL

Two procedures have been proposed. The first involves drenching schedules alone, the second involves the integration of *limited* anthelmintic treatments with planned stock and pasture management.

#### BASIC DRENCHING SCHEDULES

See Table 1.

#### INTEGRATED CONTROL OF GASTRO-INTESTINAL NEMATODE INFECTIONS IN SHEEP AND CATTLE

##### *General Principles*

In the past, it has been generally accepted that pasture management for parasite control is of secondary importance to efficient pasture utilization. With the recent trend towards diversification of farm management systems, it is appropriate to consider those that can contribute significantly to more economic and effective parasite control.

The essential requirement is the provision of "safe" pasture for susceptible animals at appropriate times. This so-called "safe" pasture is not actually parasite-free but has too few nematode larvae on it to be directly damaging to susceptible animals. Such "safe" pasture can be produced by:

- (1) Pasture spelling (rested pasture, aftermaths remaining after cuts of silage and hay).
- (2) Utilizing new pasture and fodder crops.
- (3) Alternate grazing by different host species, *i.e.*, sheep or cattle.
- (4) Grazing by resistant animals of the same species, *i.e.*, older stock.

The duration of pasture spelling necessary for the larval population to decline to a safe level depends on climatic conditions and ranges from 2 to 6 months.

During periods of high pasture growth, spelling can be achieved by taking a crop of silage or hay; the aftermath is "safe" pasture. When pasture growth is slower it might be possible simply to leave the paddocks free of stock. However, as stocking rates increase this becomes more difficult.

Pasture can also be made "safe" by grazing adult resistant animals. These animals deposit fewer eggs than the number of larvae they ingest. Comparable results can be achieved by the alternate grazing of sheep and cattle as there is little cross-infection by nematodes from the two host species. Thus sheep, especially adults, effectively clean up pastures contaminated previously by calves and similarly cattle following lambs.

Rotational grazing of young animals alone, even with an interval of up to 8 weeks, does not contribute to parasite control and may even increase the risk of serious infection. Such practices may return animals to an excessively high rather than a low level of pasture infection. With a dense stocking of small areas in succession, an abnormally high level of pasture infection may result on those paddocks contaminated under conditions that are extremely favourable for larval development.

#### *The Basis and Advantages of Practical Integrated Control*

The published report suggests integrated parasite control programmes covering the principal types of sheep and dairy farms, namely, sheep farms without cattle, farms with both sheep and cattle, dairy farms with a single, spring-born calf crop and dairy farms with extended calving. The procedure for each programme is given and the rationale explained.

An important requirement for integrated control is that farms should be preferably divided into three sectors for the grazing young stock. One sector to be used August-December, another December-March and the third March-August. Each area may be grazed by older, resistant stock when not occupied by young animals. However, young animals should not be returned to any area they previously grazed in the same season. In order to minimize the build-up of infection on each new "safe" sector, animals should be drenched with a broad-spectrum anthelmintic when they are moved.

The chief benefits of this procedure for nematode control are:

- (1) The use of anthelmintics in the manner described achieves more efficient parasite control.
- (2) The frequency of mustering and drenching is reduced.
- (3) As the young animals are prevented from acquiring heavy infections, the contamination rate of the whole property is reduced.
- (4) The procedures are compatible with current pasture management techniques.

The integrated programmes suggested in the report have not been evaluated fully under farming conditions and, initially, constant surveillance should be maintained. The need for any additional treatments should be determined on the basis of symptoms and/or weather conditions particularly favourable to larval development.