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**THE EFFECT OF HOST IMMUNITY
ON THE DEVELOPMENT AND SURVIVAL
OF THE FREE-LIVING STAGES OF COMMON
TRICHOSTRONGYLID PARASITES OF SHEEP**

A thesis presented in partial fulfilment of the
requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Veterinary Science

at Massey University, Palmerston North,
New Zealand.

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2000

ABSTRACT

The effect of host immunity on the free-living stages of common trichostrongylid parasites was studied in a series of experiments, involving both artificially infected housed animals and naturally infected animals in the field.

In Perendale ewes, bred for either enhanced or lowered resistance to nematodes, reduced developmental success of eggs to infective larvae was found in the resistant animals at some times of the year ($p < 0.01$). This was consistent with the hypothesis of an adverse effect of increased host immunity on the development of the free-living stages of gastrointestinal nematodes. In lambs, this effect had been demonstrated previously and again in 1998, whereas results from 1997 were inconsistent.

In fleece-weight selected and control lines of Romney lambs, exposed to the same level of pasture larval challenge, developmental success decreased with time ($p < 0.001$), although the two lines did not differ. This was consistent with an increasing level of host immunity in both lines and provided strong support for the hypothesis of host immunity having an adverse effect on larval development.

Nematode eggs from lambs in the field treated orally with either ivermectin or albendazole, did not differ in developmental success, providing no evidence that host immunity was influenced by the type of anthelmintic used.

A lower developmental success of *O. circumcincta* in an LDA ($p < 0.001$) was found in animals relatively immune to this parasite compared to control animals. In faecal cultures a significant difference was not demonstrated, but group sizes were very small.

An effect of host immunity on the developmental success and infectivity of larvae of *T. colubriformis* could not be demonstrated in trickle-infected groups of lambs that differed in their immunity to this parasite, one group being immunosuppressed with cortico-steroids.

An adverse effect of small intestinal mucus and contents on larval development was demonstrated. This was more potent in intestinal contents than mucus. Although source animals differed greatly in their immunity to *T. colubriformis*, differences between immune and immunosuppressed animals in the magnitude of the effect of intestinal mucus and contents on larval development were not found. The results suggested that the effect of intestinal mucus and contents was not immunological but rather caused by some physical and non-specific properties.

Overall, the results reported in this thesis further support the hypothesis of host immunity having an adverse effect on the development of the free-living stages of

gastrointestinal nematodes of sheep. This was most evident in animals with naturally acquired infections and in housed animals infected with *O. circumincta*. It is suggested that the failure to demonstrate this in experimental infections with *T. colubriformis* may have been due to the use of cortico-steroids to suppress immune responses.

ACKNOWLEDGEMENTS

There are a great number of people without whom this Ph.D. project would not have been possible.

First of all, the late Professor Peter Nansen, to whom I am greatly indebted for many reasons - making me interested in Parasitology as an undergraduate student, helping me get a Ph.D. Fellowship from the Danish Research Academy, being a friend and showing a keen interest in my work.

And my three highly motivated and supportive supervisors who believed in the project (and me) from the beginning. Tony Charleston, as a chief supervisor, had the pleasure of helping me with the major part of the editing of the thesis and generally helped during planning and paperwork stages with great enthusiasm. Bill Pomroy, with his genuine Australian sense of humour, helped to make the field work, lab work and thinking work very enjoyable. Dave Leathwick, a good kiwi, who with his direct and down to earth approach to complex problems, particularly in statistics, was invaluable

This thesis and my life in Palmerston North would have been a lot poorer without the friendships of and help from Barbara Adlington and Shirley Calder, and more recently Sheila Ramsay, in the Parasitology lab at Massey. I would also like to thank Rajesh Gopal and his family, Sabine Przemek, Caroline Twentyman and Miho Minamikawa for good company in and around the Parasitology lab. Also special thanks to Faris Sharpe for his assistance (and great sense of humour) in the PM room and Pat Davey and Pam Slack for their assistance and helpfulness in the preparation of histological sections.

Over the years I've enjoyed the company and help from a great number of people within AgResearch. In the Parasitology group: Dave Leathwick (of course) and Ian Sutherland whose interesting ideas on Parasitology and life in general have been most inspiring over the years. Also a great big thanks to the rest of the helpful team for hanging in there with me on sunny as well as on rainy days: Chris Miller, Sam Atkinson, Tania Waghorn and Ingrid Moen. The friendships of Jill Carter and Tony Parsons made it all more enjoyable too.

At AgResearch Ballantrae, John Napier was an invaluable help in providing animals for some of my trials. At AgResearch Wallaceville, I was confidently guided through the world of ELISA by Richard Green and was given excellent advice on some aspects of my laboratory work by Tony Pernthaner, Alex Vlassoff and Aye Soe.

All experiments for this thesis, involving the use of animals, were approved by the CRI Animal Ethics Committee and the Massey University Ethics Committee.

Money does in many ways make the world go around and I was fortunate enough to receive a great deal of financial support, for which I am very grateful:

- The Danish Research Academy paid the high international Ph.D. tuition fees and supported conference activities
- The Massey Doctoral Scholarship
- Novartis Animal Health
- IVABS travel fund
- Massey University Graduate Research Fund
- Riverside Farm Foundation
- Meat New Zealand

A number of friends from New Zealand and other places in the world made my time here in New Zealand extra enjoyable. Thanks for being there: Gill & Moses, Jill & Adrian, Jörg, Martin, Peter, Michal, Anja, Steffen, Miriam & Andrew, Jörg & Sonja, Brigitte, Anke, Sylvia, Tony, Max, Iris & Shane, Nicole & Christoph, Brendon, Betina & Daniel, Gunhild, Jan & Sarah. See you all again soon!!

I would also like to thank my family in Denmark for their love and support during the last almost 4 years, and last but not least Henning, who stood by my side through it all and made my life here wonderful and special.

I would like to dedicate this thesis to my late grandmother, Laura, whom I miss dearly.

The Road to Wisdom

The road to wisdom? – Well it's plain
and simple to express:

Err
and err
and err again
but less
and less
and less

(Piet Hein)

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