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Contract introduction: the problem of anthelmintic resistance.

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Anthelmintic (drench) resistance in New Zealand's ruminant livestock is arguably the biggest single threat to sustainable future pastoral production. Clinical and sub-clinical parasitism impacts not only on animal health, but on animal welfare, and hence the image of pastoral production systems, total production and production efficiency and has a marked impact on the economic bottom line for both farmers and the country as a whole. In 2001 it was estimated for the relatively small NZ deer industry alone (worth \$311 million in export earnings) that parasitism cost \$12.8 million per annum in production losses due to parasitism and parasite control (Mackintosh and Wilson, 2002).

There are only three broad-spectrum anthelmintic groups available for control of ruminant nematodes. These are Group 1, the benzimidazoles (BZ's or white drenches), Group 2, the imidazothiazoles (levamisole LVS or clear drench) and hydropyrimidines (pyrantel/ morantel) and Group 3, the macrocyclic lactones (ivermectins and milbemycins, ML) (Coles *et al.*, 2006). No new anthelmintics with different modes of action are expected on the market in the near future (Coles *et al.*, 2006).

The Landcorp Lecture (van Wyk, 2006) will hopefully make those involved in animal production pull their heads out of the sand and face the facts about anthelmintic resistance. Be

prepared for a shock. The problem is now entering the final phase where on some farms no anthelmintics remain with which to control worms whilst maintaining profitable animal production (van Wyk, 2006). Last year in Scotland the first report was published of a sheep farm closing due to failure of the final resort, moxidectin (ML), to adequately control the abomasal parasite *Teladorsagia circumcincta* (Sargison *et al.*, 2005).

In this contract session, van Wyk (2006), Rhodes *et al.*, (2006) and preliminary results from Bates *et al.*, (2006) will outline the current level of anthelmintic resistance both in New Zealand and the World. Pomroy (2006) will address the implications of, and what lessons can be learned from, the results obtained from New Zealand's largest and most comprehensive survey of drench resistance undertaken to date (Rhodes *et al.*, 2006).

Clearly action is urgently required to address the problem of drench resistance. Both van Wyk (2006) and Pomroy (2006) will offer some suggestions for the way forward to manage drench resistance. Justification for research into alternative control solutions such as bioactive plants (Hoste *et al.*, 2006) is now enhanced, but these alternatives must be considered as components of a holistic integrated approach towards sustainable control of nematode parasitism, which will probably always rely to some extent on anthelmintics.

A profile of anthelmintic resistance and parasite control practices in New Zealand – results from a 2005 survey

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INTRODUCTION

The development and spread of internal parasite resistance to anthelmintics continues, as evidenced by submissions to animal health laboratories, practice surveys and field observations. The spectre of resistance in parasites of sheep was initially highlighted in New Zealand in 1980 (Kemp and Smith, 1980). Through the 2 decades since then farmers have been encouraged to limit excessive use of anthelmintics, drench-test,

develop annual drench-family rotations, adopt preventive-drenching practices, use faecal egg counts and trigger drenching, and quarantine management as tactics for reducing the rate of development of resistance on their farm. However, over the same time period, resistance has gone from being an oddity to being common place. Submissions to animal health laboratories over a decade or more have been tabulated and published giving perhaps our strongest indication of the progress in resistance development. The most

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