

Integrating ecological perspectives into anthelmintic resistance management

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Despite the large body of research on anthelmintic resistance (AR) in parasitic nematodes of livestock, the interactions between AR and parasite ecology are poorly understood. The relative costs and benefits of resistance could be influenced both by environment and parasite life history traits. This project aims to investigate how interactions between environment, life history traits and ivermectin treatment could influence AR in *Haemonchus contortus*, an economically important gastrointestinal nematode of sheep.

Donor sheep were orally infected with either a multidrug resistant (MHco18) or susceptible (MHco3) isolate of *H. contortus*. Based on faecal egg counts, MHco3 infections reached patency earlier than MHco18. Sheep were treated with a standard dose of ivermectin (0.2mg/kg; MHco18), a low dose of ivermectin (0.012mg/kg; MHco3) or left as untreated controls. Adult worms were collected at post-mortem. Adult worm body size showed no significant difference associated with isolate or treatment, but the effect of the donor sheep was significant, implying that host-parasite interactions impact size. Faecal eggs were collected pre- and post-ivermectin treatment, with egg hatch and larval development assays conducted across a range of temperatures. There was no significant effect of isolate or treatment on egg hatch and larval development success. However, over the course of the experiment egg hatch and larval development rates varied at the temperature limits, suggesting time to patency can influence larval survival.

The presentation will highlight the complex interaction of factors influencing adult size and larval survival, highlighting possible mechanisms by which ecological factors could be utilised in AR management.