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# Development of an In Vivo Exsheathment Assay of Infective L3 Haemonchus contortus Larvae in Fistualated Sheep

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Gastrointestinal nematodes (GIN) hinder the sustainable production of small ruminants on pasture and parasite resistance to chemical dewormers is becoming a growing concern. Condensed tannin containing legume forages are being tested to evaluate their anti-parasitic properties and potential contribution to an overall parasite control program for small ruminants such as sheep and goats. One of the most pathogenic GIN of small ruminants is *Haemonchus contortus* (Figure 1). The final step to full infectivity of *H. contortus* third stage larvae (L3) is exsheathment (Figure 2) in the rumen. The objective of this study was to establish an *in vivo* exsheathment assay in fistulated sheep (Figure 3) as a tool to evaluate the ability of several varieties of birdsfoot trefoil, a condensed tannin containing forage, to inhibit the exsheathment of *H. contortus* L3.

Three different methods of containment of the infective L3 within the rumen were evaluated: histology cassettes fitted with 8 micron mesh, polypropylene sample jars fitted with 8 micron mesh, and dialysis tubing with a 300 kDa molecular weight cut off. The percentage of viable and exsheathed infective L3 larvae were determined by microscope. Criteria used to evaluate the efficacy of containment were the percent of recovered L3 from the containment device and the percent of total L3 exsheathed.

We concluded that histology cassettes fitted with nylon mesh are not a viable containment method and may result in infection of the sheep due to a low recovery of the larvae. Dialysis tubing was also not a viable containment method, as it did not provide adequate flow of rumen fluid through the container to allow exsheathment to occur. While we attained a very high percentage of exsheathment using the sample jars with both ends open, further research should be done to perfect the recovery of the larvae from the jars. In addition, further research also needs to be done to determine the optimal exsheathment time in the rumen using freshly harvested L3 larvae.