**Dietary tannins acting as anthelmintic agents?**

N.L. Butter, J.M. Dawson, D. Wakelin & P.J. Buttery

School of Biological Sciences, University of Nottingham, Sutton

Bonington Campus, Loughborough, Leicestershire LE12 5RD, UK.

**Introduction**

- Browse plants often contain condensed tannins.
- Gastrointestinal nematode infections in sheep have been shown to be reduced after feeding diets containing condensed tannins (CT).
- CT could reduce nematode infections by increasing post-ruminal protein supply or by exerting toxic effects against the worm.
- The objective of these studies was to determine if Quebracho tannin (QT) was toxic on contact with intestinal nematodes.

**Materials and Methods**

- **Rat Trial.** 48 male Wistar rats fed a low protein diet (100g casein/kg) ± 4% QT.
- 4 groups (2x control & 2x QT-fed) of 8 rats were orally infected with 1000 T. spiralis larvae.
- 2 groups (1 control & 1 QT-fed) were subcutaneously injected with 2500 N. brasiliensis larvae.
- Worm burdens were recovered on days 2 or 5 post infection (pi) for T. spiralis infected rats and on day 5 only for N. brasiliensis infected rats.
- **In vitro.** Adult N. brasiliensis worms were recovered from an infected rat & incubated in vitro (x3) in Hanks balanced salt solution (HBSS) containing 0, 0.01, 0.05 & 0.125% QT ± 0.1% polyethylene glycol (PEG).
- The motility of the worms was used as an index of survival & assessed over 10h.

**Results and Discussion**

- **Rat Trial.** Feeding QT did not significantly affect T. spiralis worm burdens (p>0.1) but significantly reduced (p<0.001) N. brasiliensis worm burdens (table 1). QT appears to only affect parasites present in the intestinal lumen (table 1).
- The activity of QT was compromised at all levels of QT (Fig 1). Time taken for 50% mortality to be seen is shown in table 2. Nematode survival was higher in the presence of 0.1% (w/v) PEG at all QT levels. QT may increase parasite mortality by either affecting the cuticle or the digestive system of the worm.

**Conclusions**

- Quebracho tannin and possibly other condensed tannins found in forages, may reduce nematode infection through a direct effect against the worm.
- Further work is required to identify which parasites are susceptible and the mechanism through which toxicity occurs.

**Acknowledgements**

This work was jointly supported by DFID and the University of Nottingham.