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The use of *Lespedeza cuneata* for natural control of gastrointestinal nematodes in merino sheep

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INTRODUCTION

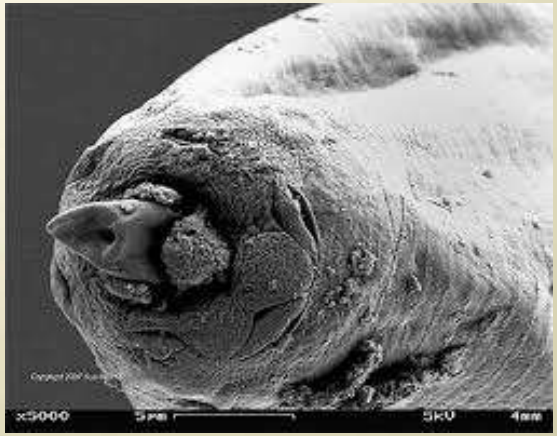
Small stock infestation with gastrointestinal nematodes:

Severe production and animal losses worldwide

Gastrointestinal nematodes/parasites:

- Helminths - different genera, class of Nematodes, living in the digestive tract of their host

- Voracious bloodsuckers: extensive damage to mucosa -increased plasma leakages, losses of endogenous protein (anaemia, bottle jaw and oedema)



- Anaemia results in a restricted oxygen and iron supply to the cells in the body

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INTRODUCTION (cont.)

- **Backbone of control of internal parasites: Anthelmintic chemotherapy/chemical drugs**

But

- **Increased public awareness for drug residues in animal products**
- **Increasing development of resistant strains of parasites**

Resulting in

- **Search for sustainable alternatives**

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INTRODUCTION cont.

In the search for alternatives – Phytotherapy – bio-active forages

Bio-active forages (Rahmann, 2004):

Forages that contain secondary plant substances and metabolites

…. beneficial for animal health,
not necessarily only aimed at optimized nutrition

Added advantage of forages – already established pasture - commercial seed available

New application for planted pastures

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INTRODUCTION (cont.)

But

Lack of verified implementation strategies to exploit these anthelmintic properties at a farm level

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INTRODUCTION (cont.)

Lespedeza cuneata
(Sericea lespedeza,
Poormans lucerne)

Pasture value
+
Anthelmintic properties

Contains:

- Condensed tannins
- Group of metabolites
- Variable data?

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MATERIALS AND METHODS

Treatments

- *Lespedeza cuneata* hay – leaf fraction only
- Medicago sativa hay control

Condensed Tannins!

Lespedeza cuneata? **Yes** (up to 150 g CT kg^{-1} DM)

Medicago sativa? Very low (0.5 g CT kg^{-1} DM)

Rations were balanced

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MATERIALS AND METHODS (cont.)

Animals

- Merino ewes (52 ± 6.18 kg)
- Confinement feeding in partly covered barn
- Grazing prior to trial on rain fed grass pasture - became naturally infected with gastrointestinal parasites
- Ranked accordingly to faecal egg count (FEC) status and randomly assigned to treatments

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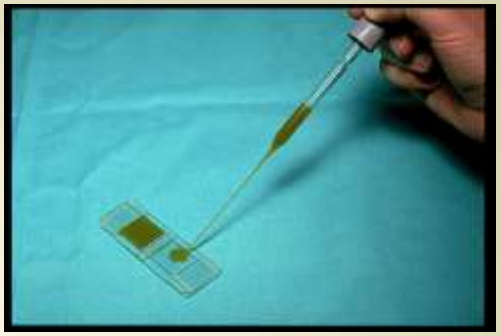
Data collected:



1. **Live Weights**
2. **Weekly Faecal egg count (FEC) ind. sheep**

Modified Mc Master technique

3. **Famacha**

4. **Rectal temperatures**

Digiflash handheld thermometer

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MATERIALS AND METHODS (cont.)

Statistical analysis

Data analysed with Genstat (Payne *et al*., 2014)

Repeated measures Analysis of Variance was used

Log transformations were done on FEC data to stabilize variance

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RESULTS and discussions

Chemical analysis of rations

%	Lespedeza	Medicago
Crude protein	17.2	16.6
NDF	41.9	44.42
ADF	30.5	36.12

1. Live weight

Treatments = no significance (P> 0.05)
Time significant (P< 0.05) – increased live mass in both groups

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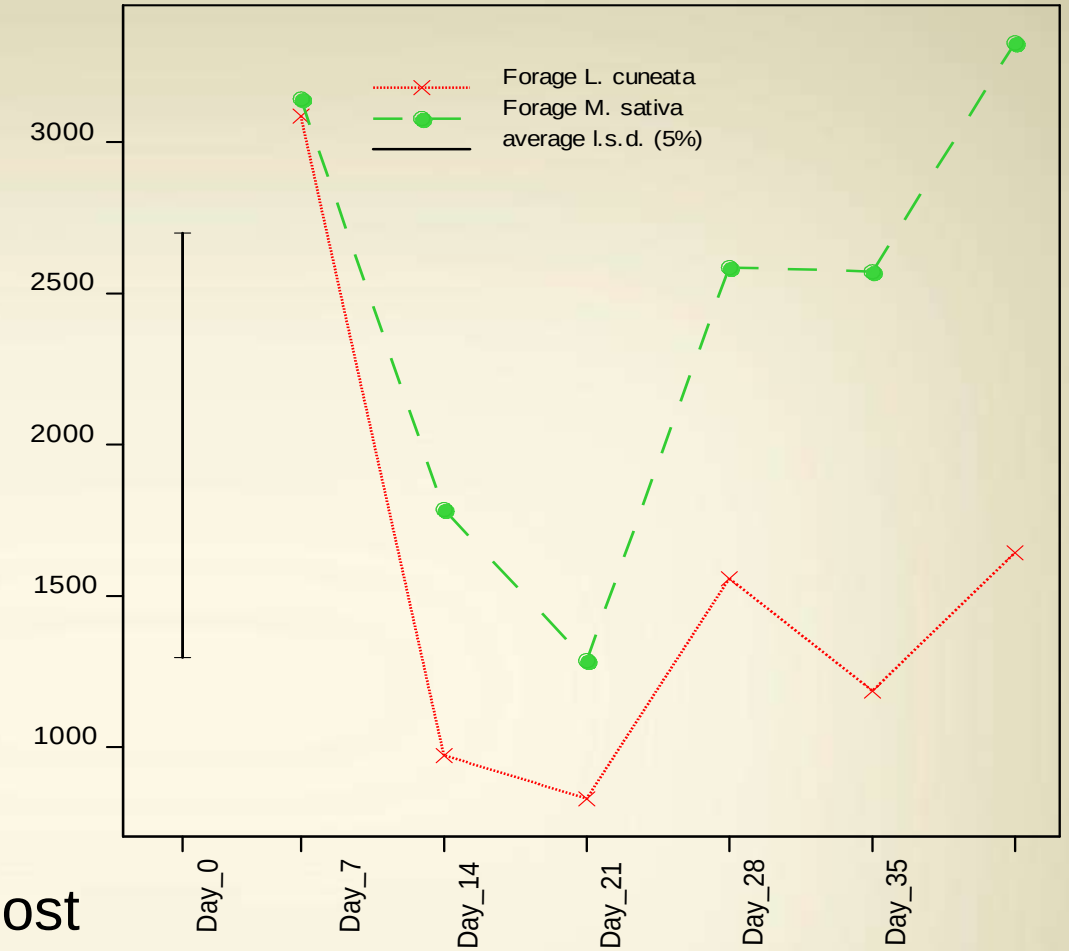
RESULTS (cont.)

2. FEC

- High protein feed-enhances immune response

- EPG count of 1600 – expected blood loss of 10 ml day^{-1} in a parasitized host

- Blood loss in excess of this norm, will result in anaemia (mature sheep).



Mean faecal egg counts (FEC) of merino sheep fed a *L. cuneata* hay ration (leaves only) or *M. sativa* hay.

Treatments = No significance ($P \geq 0.05$) up to Day 28, but become significantly different on Day 35 ($P < 0.05$)

Time = highly significant ($P < 0.01$).

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RESULTS (cont.)

3. Famacha

Treatments = No significance (P>0.05)

Anaemia detection

**Did not pick up the changes in infection, however infection
was relative low (±3000 EPG).
Response of high protein ration?**

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RESULTS (cont.)

4. Rectal temperatures

Parasitism - anaemia

•Anaemia - below normal body temperature.

Mean rectal temperature (ºC) of merino sheep fed a *L. cuneata* hay ration (leaves only) or *M. sativa* hay.

Differences in mean rectal temperature between the treatments became significant on Day 21 ($P<0.007$) and on Day 28 ($P<0.008$).

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CONCLUSION

Results, although some values did not differ significantly, indicated that *L. cuneata hay* can reduce the parasite infestation in sheep with agricultural value.

The possibility of using the hay as dewormer offers exciting possibilities:

- Post-weaned lambs, on veld in spring
- *L. cuneata* bales offered to livestock, grazing pastures, to reduce the contamination of pastures.

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CONCLUSION (cont.)

More Questions:

What % of ration needed to depress internal parasites?

Implementation strategies?

Self medication?

Part of holistic approach towards worm control!

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