Effect of different sources of condensed tannins on gastrointestinal nematodes burden in sheep under grazing conditions, in Uruguay.

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- In Uruguay, the lack of efficacy of the majority of the anthelmintic drugs available in the market is jeopardicing sheep production systems.
- The main gastrointestinal nematode (GIN) is *Haemonchus contortus* and multiresistant strain are widespread among the sheep farms.
- The aim of this study was to evaluate the effect of a bioactive forage or an extract of Quebracho (Schinopsis balanceae) rich in condensed tannins as sustainable GIN control method, in sheep under grazing conditions.

METHODS

- 2 Field trials (Trial 1 Spring 2015; Trial 2 Winter 2016)
- Completed randomized factorial design:2 legumes x 3 treatments

2 Legumes

Lotus uliginosus cv INIA E-Tanin (LU) (treatment)

Trifolium repens cv Estanzuela Zapicán (TR, control)

Area=1.33Ha each legume subplot. Rotational grazing, moving each 14 days

Animals: Trial 1, 60 male wethers Texel-Milchaf-Corriedale crossbreed. Trial 2, 60 Australian Merino wethers (n=10 per treatment).

Animal measurements and samplings:

Body weight, body score condition and fecal samplings every 14 days

Pasture measurements:

Dry matter, crude protein, condensed tannins and pasture L3 infectivity.

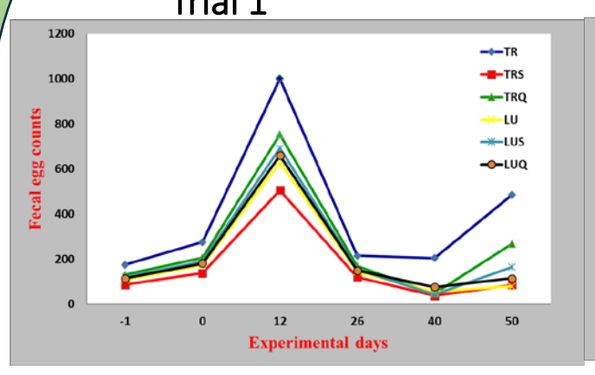
Laboratory work

Fecal egg counts (FEC); coprocultures & L3 classification. At the end of the trials the lambs were sent to the slaughterhouse and parasitic necropsies were performed to count and classify adult GIN and L5.

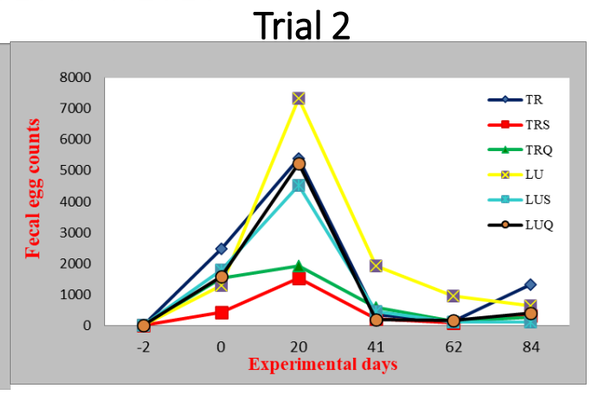
RESULTS

FEC mean distributions during experimental period by treatments during 2015 and 2016

Trial 1

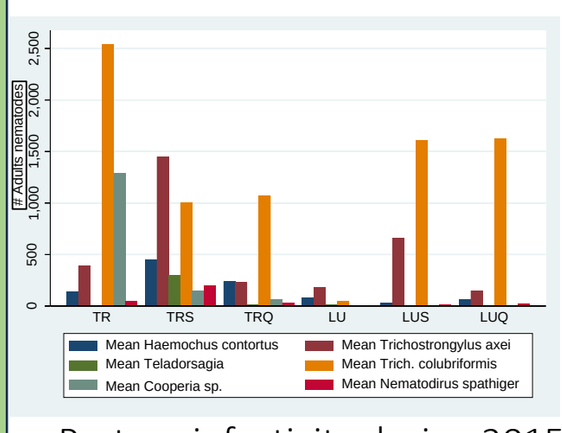


Trial 2

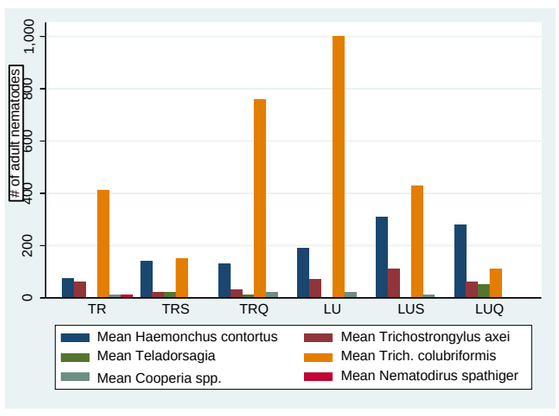


Mean adult worms recovered at the end of the trials

Trial 1



Trial 2



Pasture infectivity during 2015. # of L3 recovered per samplings and by treatement

Treatment	Day 0	Day 12	Day 26	Day 40
TR	22ab	21b	294 a	0c
TRS	0b	21b	109c	73bc
TRQ	71a	0b	231 a	14c
LU	19b	0b	40d	221 a
LUS	24ab	92a	0d	109b
LUQ	0b	21b	176b	40c

Different letters between rows indicates significant differences among treatment (p<0.05)

The inicial body weigth of the T1 lambs were 38.6 kg and at the end 49.2 with no difference by treatment. For T2, lambs mean initial weight was 28.5 and ended with 41.9 kg and during the whole trial the lambs form treatment TRQ were heavier than TR, LUQ, LUS and LU (p<0.05).

Trial 1

- Least square means analysis showed geometric mean FECs higher for TR in comparison with TRS, LUS and LUQ (p<0.05) with reductions of 70%, 77%, 66% & 77% respectively.
- The FECs peaked at day 12 and then dropped till the end of the trial without drenching.

Trial 2

- FECs showed a main peak at day +16 and 30 lambs needed to be drenched (8,2,3,6,5,6 from treatments TR,TRS, TRQ, LU, LUS and LUQ, respectively).
- There was a significant interaction between "treatment & sampling date" (P=0.014).

Adult worms

- The main GIN species prevalent were *Trichostrongylus colubriformis* & *axei* (T1), followed by *Haemonchus contortus* (T2), with low proportion of Teladorsagia and Nematodirus spatigher.
- Non significant difference between GIN species, treatments (P>0.05) for both Trials.

Legumes quality at the beginning and end of Trial 1

	Start	End	Start	End
	Lotus uliginosus		*Trifolium repens*	
DM (Kg/Ha)	2270	2256	3149	3542
PC (%)	15.0	14.0	17.0	18.0
TC (%)	3.6	3.6	Trace	Trace

Legumes quality at the beginning and end of Trial 2

	Start	End	Start	End
	Lotus uliginosus		*Trifolium repens*	
DM (Kg/Ha)	1676	2225	1729	2686
PC (%)	15.0	14.0	24.0	20.0
TC (%)	6.7	6.7	0.16	0.16

CONCLUSIONS

- The lambs grazing a legume with high CT content (LU, LUS or LUQ) or supplemented with CT extract, had fewer FEC than those grazing a legume with low CT content during Spring 2015 (Trial 1). All lambs were able to reach the fattening weight without receiving chemical treatment.
- The FEC during the second year (Trial 2) were variable and the lambs grazing the legume without CT had Good performance, probably due to the high crude protein and dry matter content.
- Further Research is necessary in order to determine the chemical structure of the condensed tannins present in *Lotus uliginosus* spp. This will allow the design of future *in vitro* and *in vivo* field experiments.