

Quebracho (*Schinopsis quebracho-colorado*) tannin for the treatment of sheep gastrointestinal parasites. Effect on faecal egg counts and lamb growth

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Introduction Farmers have become heavily reliant on anthelmintics for the control of nematode parasites. Due to the widespread development of anthelmintic resistance, alternative approaches for control of nematode parasites are needed. Cruden and Hovell (2008) reported that commercial lambs treated with quebracho tannin had reduced faecal egg counts and improved lamb growth. This paper reports a second *in vivo* study with quebracho tannins at higher dose rates in lambs.

Materials and methods Sixty male and female Suffolk cross lambs, of 7 to 8 months were chosen randomly from a group that had shown symptoms of internal parasites 14 days prior to the start of the experiment. They were kept in an 11 acre field, and were free to graze on grass, or kale. No concentrates were fed. They had free access to clean water at all times. Exactly one week before the first dosing, the lambs were brought inside to the sheep handling system where all husbandry activities were carried out. Lambs were individually weighed, and randomised to one of 5 groups with 12 lambs in each. The following week (20/10/07), all lambs were weighed, the first administration of wormer was given, and faecal samples taken from 3 identified lambs from each group. Lambs were weighed and faecal samples taken (same 3 lambs) at 1 week intervals and until 01/12/07. The Quebracho Tannin was the same as used by Cruden & Hovell (2008), and was mixed with water at 40°C, and orally administered by conventional dosing gun. The 5 treatments were:- 1) Dosed once 60g tannin. 2) Dosed twice with 60g tannin, the second dose given a week after the first. 3) Dosed once with 90g tannin. 4) Dosed once with a conventional anthelmintic. 'Zermex' active ingredient Moxidectin which belongs to the Ivermectin group. 5) Untreated Control.. Faecal samples were stored at 4°C until they were examined in the laboratory, and the number of nematode eggs per gram of faeces determined using the Improved Modified McMaster Technique (Mairiead MacLennan, personal communication). The effect of treatment on faecal egg counts (FEC) was analysed by one-way analysis of variance at each separate sampling time. Data were transformed ($\log(x+1)$) to stabilise the variance.

Results Lambs dosed with Zermex had a lower faecal egg counts (FEC) than the Control – although not always significant statistically (Table 1). There were no significant effects of quebracho tannins on FECs, although there was the suggestion of a decline in FECs of Trichostrongyloidea. Treatment with Zermex gave the best ($P<0.05$) weight gain of 12.5 kg, (Table 2). There was a clear growth response to the tannin ($P<0.05$) despite there being no clear effect on FECs.

Table 1 Back transformed means and ranges of faecal egg counts per g fresh faeces. (n=3)

Treatment		Control	Tannin 60g once	Tannin 60g twice	Tannin 90g Once	Anthelmintic (Zermex)	SEM
Trichostrongyloidea	Week 0	2094	2065	1687	1932	1667	453
	Week 2	2104	1892	940	1888	13.6	1272
	Week 4	1738	1742	551	1321	0	2110
	Week 6	1361	1479	585	935	5.6	2080
Nematodirus	Week 0	394	496	409	443	527	109
	Week 2	400	460	383	386	0	59
	Week 4	400	415	323	3126	0	179
	Week 6	333	311	262	247	0	46
Other Species	Week 0	395	450	311	272	247	67
	Week 2	395	431	288	272	0	53
	Week 4	398	406	259	155	0	78
	Week 6	262	272	165	31.1	0	180

Table 2 Initial, and final weights of lambs, and weight gains. (n = 12)

	Control	Quebracho tannin		Zermex'	SEM	
		60g	60g Twice	90g		
Initial Weight (kg) (I)	38.1	36.8	36.7	36.9	38.0	0.31
Final Weight (kg) (F)	43.9	45.6	47.1	47.3	49.5	0.93
Weight Gain (kg) (F - I)	5.8	8.9	10.4	9.4	12.5	1.09

Conclusions It is concluded that the use of quebracho tannins could become an effective approach for the treatment of intestinal parasites, especially with the increasing prevalence of resistance to conventional anthelmintics. More work is needed to develop optimal dosing and management regimens with tannins.

Acknowledgements We are grateful to Mairiead MacLennan of SAC, Mill of Craibstone, Bucksburn, Aberdeen AB21 9TB for guidance on FEC measurements.

Reference Cruden, L and Hovell, F.D.DeB. 2008. British Society of Animal Science Annual Proceedings. p96.