

## Use of green sulla forage for feeding. 1. Effects on lamb growth and gastrointestinal nematode parasite infestation

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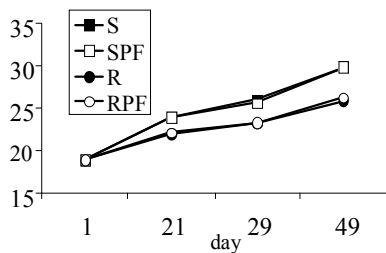
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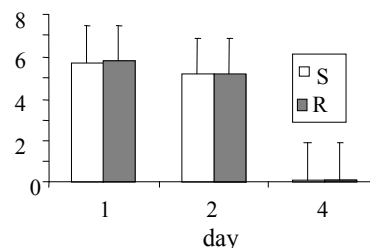
**Introduction** Recent studies have shown that some forage legumes containing condensed tannins (CT), such as sulla (*Hedysarum coronarium* L.), can reduce the gastrointestinal nematode burden in sheep (Niezen *et al.*, 1998) and increase post-ruminal protein availability (Waghorn *et al.*, 1994). This study aimed to evaluate the anthelmintic and nutritional properties of sulla forage in relation to its CT content. Thus, the growth performance and the level of nematode infestation of lambs fed sulla were compared with those of lambs fed ryegrass (*Lolium multiflorum* Lam. subsp. *wersterwoldicum*), lacking in CT.

**Materials and methods** Thirty-two male Comisana lambs aged 100 d were divided into two groups, fed *ad libitum* green forage of sulla (S) or ryegrass (R), cut daily, and 200 g/head per d of a concentrate for 49 d until slaughter. Within each group, eight lambs were treated in order to keep them parasite-free (SPF and RPF groups). During the trial, the lambs' live weight and feed intake were recorded, and faeces were obtained for faecal egg count (FEC) by a modified McMaster technique. At slaughter, gastrointestinal tracts were removed for nematode counting and identification. The forage was analysed for chemical composition; the CT content was determined by the butanol-HCl method. The data was analysed using the GLM procedure of SAS.

**Results** On average, sulla was higher in crude protein (CP) (17.9 vs. 11.9% of dry matter: DM) and lower in NDF (39.8 vs. 55.5%) than ryegrass and had a CT level equal to 1.7% (ranging from 1.5 to 2.3%). Lambs fed sulla showed a superior growth rate (225 vs. 147 g/d; s.e. 6.7;  $P \leq 0.0001$ ) and final live weight (29.9 vs. 26.1 kg; s.e. 1.0;  $P \leq 0.013$ ) (Figure 1), due to both higher forage intake (769 vs. 568 g/d DM; s.e. 15.9;  $P \leq 0.001$ ) and lower feed conversion ratio (5.1 vs. 5.9; s.e. 0.28;  $P \leq 0.04$ ). The CT intake of lambs fed sulla was 15.6 g/d on average. Growth performance did not differ between non-parasitised and parasitised lambs, the level of infestation being low. Lambs given anthelmintic had FEC of zero. Diet did not affect FEC in parasitised lambs; nevertheless it showed a marked decrease with both forages at the end of trial (Figure 2), probably due to the improved environment and nutritional status of the lambs. The presence of nematode worms in the gastrointestinal tracts was low. Nevertheless, sulla was associated with a fewer total male adult nematodes (108 vs. 131). Most of these were of the *Teladorsagia circumcincta* species and were found in the abomasum (98 vs. 123 in S and R; s.e. 33.9), but these differences were not significant.



**Figure 1** Lamb liveweight (kg) during experiment



**Figure 2** Faecal egg count (FEC) (100 eggs/g dry faeces) in parasitised lambs during experiment

**Conclusions** There was a positive effect of S on lamb growth in comparison with R. This was due to higher feed intake and better nutritional efficiency, linked to a high level of CP and, possibly, improved intestinal protein utilisation through CT in sulla inhibiting ruminal degradation. In spite of low levels of nematode infestation overall, sulla showed a tendency to reduced strongyle worm population in the abomasum.

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### References

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