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Anthelmintic effects of forage chicory against parasitic nematodes in cattle

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BACKGROUND: Chicory (Cichorium intybus) has potential as a natural anthelmintic in livestock, however evidence of efficacy against cattle nematodes is lacking. Here, we investigated anthelmintic effects of chicory in stabled calves.

METHODS: Jersey male calves (2-4 months) were stratified by live weight and allocated randomly to 2 groups: chicory (CHI, n=9) and control (CON, n=6). CHI and CON calves were fed with forage chicory silage (cv. Spadona) and hay ad libitum, resp., for 8 weeks. After 2 weeks, calves were infected with 10,000 Ostertagia ostertagi and 65,000 Cooperia oncophora larvae. Fecal egg counts (FEC) and live weights were assessed weekly. Six weeks after infection, calves were slaughtered for worm recovery. In parallel, total sesquiterpene lactone (SL)-extracts from forage chicory (Spadona and cv. Puna II) were prepared and incubated with first-stage larvae (L1) of O. ostertagi. L1 viability was evaluated after 12 hours incubation.

RESULTS: Mean FECs (corrected for faecal dry matter) were not different between groups (p=0.14), but weight gains were higher in CHI calves (+ 35%; p<0.05). Mean worm counts for O. ostertagi adults were 1599 and 3752 in CHI and CON, respectively (p<0.01). Worm counting of C. oncophora is ongoing. SL extracts from Spadona chicory were toxic to O. ostertagi L1 in vitro, with a mortality of 99% at concentrations ≥ 500 mg/mL (EC₅₀ =132.8 mg/mL). Puna II-SL extracts induced a L1 mortality of only 37% at the highest concentration tested (2000 mg/mL).

CONCLUSIONS: Based on these preliminary results, chicory silage (Spadona) has significant in vivo anthelmintic effects against O. ostertagi, possibly mediated by SL, and marked differences exist in the anti-parasitic activity of SL extracts from two different chicory cultivars.