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Duddingtonia flagrans: a promising biocontrol agent for gastrointestinal nematodes

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Controlling gastrointestinal nematodes (GIN) challenges owners of small ruminants with access to pastures. Biocontrol using the nematophagous fungus *Duddingtonia flagrans* is expected to complement existing alternatives for controlling GIN in grazing animals in the future. Animals receive spores of *D. flagrans*, which pass through the gastrointestinal tract. Fungal mycelium grows out of the surviving spores, spreads through the deposited faeces and forms structures with which it traps, colonizes and destroys the GIN larvae. This leads to reduced pasture contamination with GIN larvae and lower infection of grazing animals. An experiment with lactating goats, which were naturally infected with GIN, was carried out on an organic farm. Ten animals each received either a feed additive without *D. flagrans* spores (control), a feed additive with *D. flagrans* spores at recommended sheep/cattle dosage (normal) or a feed additive with *D. flagrans* spores at a10 times higher concentration than the normal dosage (high). Spores were administered daily to each animal individually during three days. Faecal samples were taken from all animals on the day before and on the last day of feeding spores. For each sample, faecal egg counts were determined by a modified McMaster technique. Samples were cultured for 14 days and larvae were subsequently obtained. Biocontrol efficacy of *D. flagrans* was calculated for each animal individually as a percentage reduction of developed larvae after treatment compared to the number obtained before treatment. As compared to the control, in the group with the normal *D. flagrans* dose infective larvae were reduced by about 20%, whereas reduction was almost 70% in the high *D. flagrans* dose group. In the H2020 project RELACS a similar setup was carried out with artificially infected sheep, using the normal and a 10 times lower dosage of *D. flagrans* spores. Infective GIN larvae were reduced by over 95% in faeces of both *D. flagrans* groups as compared to the control. Compared to goats, lower doses were required to substantially reduce GIN larval development in faecal cultures of sheep. Funded by EU H2020 No 773431 – RELACS.