

2007 - Progress Report Workpackage 1

WP 1.1 and 1.2 – Innovative strategies for the control of nematode infections in sheep and goats: Targeted selective treatments.

Current control of gastrointestinal parasites of small ruminants focuses on the treatments of whole herds with anthelmintics, however this approach may not be sustainable due to the development of anthelmintic resistance and consumer concerns regarding residues in the environment and meat. However anthelmintics are still needed to maintain animal welfare and productivity. Targeted selective treatments (TST) may offer a means of reducing total usage of anthelmintics and the rate of development of resistance. TSTs are partial flock treatments where only the animals showing early evidence of reductions in performance or disease are treated. This approach should reduce the rate of development of resistance by leaving a proportion of animals untreated on the farm (*in refugia*) in order to maintain susceptible genes within the parasite population.

The main objective of WP 1.1 and 1.2 is the development of innovative control strategies centred upon the use of TST and based on a clear understanding of the impact of TST upon parasite population dynamics, host productivity (WP1.1) and the selection of resistance genes (WP 1.2). Research groups in different countries have been investigating the use of parasitological indicators e.g. faecal egg count (FEC) and pathophysiological markers e.g. anaemia, diarrhoea, body condition score and live weight gain as triggers for TST and assessing the effects on performance and parasite population dynamics of using these approaches. In addition, changes in the resistance status of the parasite population are being investigated both phenotypically and genotypically. The aim of these studies is to develop regionally appropriate, low input sustainable strategies for the control of nematode parasites in ruminants.

A comparison of different faecal egg counting (FEC) methods is currently underway to determine the most appropriate method and other studies are investigating how a commercially available FEC kit (FECPAK) performs in a range of farming conditions. TST experiments, either in experimental or commercial flocks, are being carried out in Britain, France, Slovakia, South Africa, Morocco, Greece and Italy, using FEC or pathophysiological markers as indicators for TST treatment. Preliminary results suggest that body condition score is not sensitive enough to be used as an indicator for treatment but, using other parameters, anthelmintic usage can be reduced using the TST approach whilst maintaining acceptable levels of production. In South Africa, where long distances have to be covered between the farm and laboratory, a new method to vacuum pack sheep faeces so that the eggs remain viable for FEC has been developed. Trials have shown that vacuum packed faecal specimens remain suitable for at least three weeks. A questionnaire to investigate the acceptability of the TST approach to farming and advisory communities has been developed

and results from France, Morocco and South Africa suggest that these groups are interested in the TST approach, provided sufficient training is available.

Studies investigating the impact of TST on development of anthelmintic resistance are being conducted in the UK, France and Morocco. Initial studies suggest that efficacy of anthelmintic treatment is maintained in the TST group compared to a suppressive worm drench regime. Experiments have begun to assess the re-introduction of genes for susceptibility into a resistant parasite population. Work has also been carried out in France and South Africa to develop an automated decision support system to provide farmers with information on when to drench. In addition, a decision support system has been developed in Scotland to identify animals that will benefit from anthelmintic treatment.