

Investigation of Endoparasite Levels and Anthelmintic Resistance in Grazing Sheep Flocks on Prince Edward Island

Jon Klymchuk¹ and Emily John^{1,2}

¹ Department of Health Management, Atlantic Veterinary College, University of Prince Edward Island, Charlottetown, PE

² Prince Edward Island Sheep Breeders' Association

Gastrointestinal nematodes (GIN) cause major illness and production loss in grazing sheep, and anthelmintic resistance is widespread in North America; however, no formal investigation of resistance has been reported for Atlantic Canada. This study determined endoparasite burden and the efficacy of three commonly used anthelmintics in grazing sheep flocks on Prince Edward Island (PEI). On three PEI farms, 45 first-season grazing lambs per flock ($n = 135$) were sampled once the flock mean fecal egg count (FEC), determined by Mini-FLOTAC, reached 350 eggs per gram (epg). Lambs were randomized to oral fenbendazole, ivermectin, or closantel ($n = 15/\text{group/farm}$), and FECs were repeated 14 days post-treatment; 130/135 lambs completed both samplings. Efficacy was assessed by the fecal egg count reduction test (FECRT), with resistance defined per World Association for the Advancement of Veterinary Parasitology guidelines as reduction $<95\%$ with a lower 95% confidence limit $<90\%$. Mean pre-treatment FEC was 670 epg (range 40–1,950) and differed markedly between farms (farm means 350–1,280 epg). Mean FEC reduction was 37.2% (95% confidence interval [CI] 32.7–43.7) for fenbendazole, 45.1% (41.6–49.9) for ivermectin, and 54.1% (50.9–57.1) for closantel. All nine farm–drug combinations met the resistance definition (farm-level reductions 27.5–70.7%), indicating resistance to all three drugs on every farm. Coprocultures on two farms (30 third-stage larvae identified per culture) found 87% (Farm A) and 89% (Farm C) were *Haemonchus contortus*. These results provide the first documentation of anthelmintic resistance in Atlantic Canadian sheep, indicating that parasite control on PEI cannot rely on these products alone and supporting FECRT-guided drug selection, refugia-based targeted treatment, and producer education through the PEI Sheep Breeders' Association.

