

Update on the prevalence of anthelmintic resistance 2021–2022

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With the routine use of Gribbles Veterinary's automated faecal egg count reduction test (FECRT) report system, we are pleased to announce the resumption of our annual update on anthelmintic resistance. This report details the analysis of data submitted to the Gribbles network for the season November 2021 to May 2022 for fully differentiated FECRT.

Data was obtained from submissions that clearly identified the test anthelmintic and sample groups with ≥ 10 animals per treatment group. Data at genus level required a pre-treatment of 50 epg per genus to be included. All other test requirements and methodology were as described by McKenna (2018). The final data set contained 3,272 data points collected from 166 FECRT submitted over this period. 1,811 data points were excluded due to insignificant numbers of a genus in a FECRT (< 50 epg in the pre-FECRT). A number of factors contribute to this including the season the FECRT was performed, prevalence of different genus on different farms and regions across New Zealand, and egg output of the genus present.

25 data points were excluded due to the test anthelmintic not being identified. 215 data points were excluded due pre-FECRT case numbers not being identified on the post-FECRT submission form. Submissions that did not clearly identify they were FECRT were not included in the dataset. Submissions where part of the FECRT was performed in-clinic and only the larval culture being performed at Gribbles were also excluded from the data set due to lack of compliance with the laboratory's accreditation and quality procedures.

These results were based on a total of 64 cases from the North Island and 102 cases from the South Island, and are presented in Table 1. The percentage of resistance for single active anthelmintic remains relatively similar to those reported in the 2018 update (McKenna 2018). Of note is the increase of double and triple combination anthelmintic treatment groups submitted in this update in comparison to that in 2018. For *Teladorsagia* the prevalence for triple active resistance in 2016-17 to 2021-22 increased from 6% to 18%, for Benzimidazole/Levamisole (BZ/LEV) dual increased from 18% to 36% and for Abamectin/Levamisole (ABA/LEV) dual increased from 3% to 30%. For *Trichostrongylus* the increase in prevalence from 2016-17 to 2021-22 for triple actives* increased from 1% to 33%, BZ/LEV dual from 13% to 42% and ABA/LEV dual from 3% to 29%.

Table 1: The prevalence of anthelmintic resistance identified in sheep nematodes by fully differentiated faecal egg count reduction tests (FECRTs) undertaken on case submissions to Gribbles Veterinary during 2021-2022 (n=3272)

PARASITE	BZ	LEV	IVE	ABA	MOX	BZ/LEV	LEV/ABA	DERQ/ABA	ABA/OXF	ABA/MONE	TRIPLE
<i>Cooperia</i>	10/60 (17%)	1/76 (1%)	0/5 (0%)	10/49 (20%)	5/32 (16%)	0/8 (0%)	10/167 (6%)	0/45 (0%)	0/13 (0%)	0/17 (0%)	1/115 (1%)
<i>Haemonchus</i>	3/22 (14%)	0/35 (0%)	0/5 (0%)	0/21 (0%)	0/16 (0%)	0/5 (0%)	0/79 (0%)	0/23 (0%)	0/7 (0%)	0/10 (0%)	1/58 (2%)
<i>Nematodirus</i>	32/50 (64%)	13/64 (20%)	0/3 (0%)	3/46 (7%)	4/21 (19%)	1/9 (11%)	8/114 (7%)	0/40 (0%)	0/10 (0%)	0/7 (0%)	4/93 (4%)
<i>Oesophagostomum / Chabertia</i>	6/51 (12%)	0/59 (0%)	0/3 (0%)	0/39 (0%)	0/15 (0%)	0/6 (0%)	3/104 (3%)	0/36 (0%)	0/11 (0%)	0/16 (0%)	0/78 (0%)
<i>Teladorsagia</i>	42/80 (53%)	48/100 (48%)	5/6 (83%)	31/70 (44%)	14/35 (40%)	4/11 (36%)	53/177 (30%)	4/63 (6%)	6/22 (27%)	2/27 (7%)	26/144 (18%)
<i>Trichostrongylus</i>	43/84 (51%)	36/104 (35%)	0/6 (0%)	17/75 (23%)	15/39 (38%)	5/12 (42%)	57/195 (29%)	3/68 (4%)	5/23 (22%)	2/28 (7%)	53/160 (33%)

(Benzimidazole BZ, Levamisole LEV, Ivermectin IVE, Abamectin ABA, Moxidectin MOX, Derquantel DERQ, Monepantel MONE, Oxfendazole OXF, TRIPLE includes several brands with 3 actives in combination)

It is noted by the author that a number of these single actives and one of the dual combinations reported are not available commercially at present. The data collected by Gribbles is done passively through submissions to the laboratory and relies on the information supplied by the submitting veterinary. Incorrect recording of the test anthelmintic, use of older stock, or off-licence use of products may explain these abnormalities.

Stratification of cases by geographical location for both anthelmintic and genus for the percentage of resistance can be found in Figures 1 and 2. The corresponding data regarding total data points analysed (including both resistant and susceptible nematodes) can be found in Tables 2 and 3.

Figure 1: Prevalence of resistance to anthelmintic recorded in sheep FECRTs submitted to Gribbles Veterinary laboratories during 2021-2022 stratified to North Island and South Island (n = 3272).

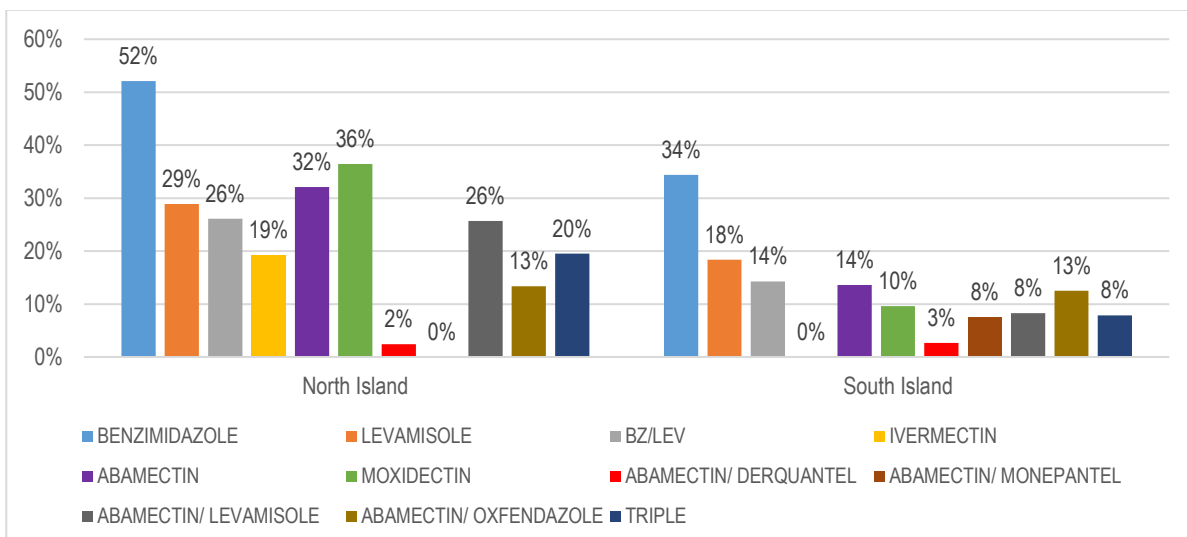


Figure 2: Prevalence of resistance to anthelmintic to genus level recorded in sheep FECRTs submitted to Gribbles Veterinary laboratories during 2021-2022 stratified to North Island and South Island (n=3272).

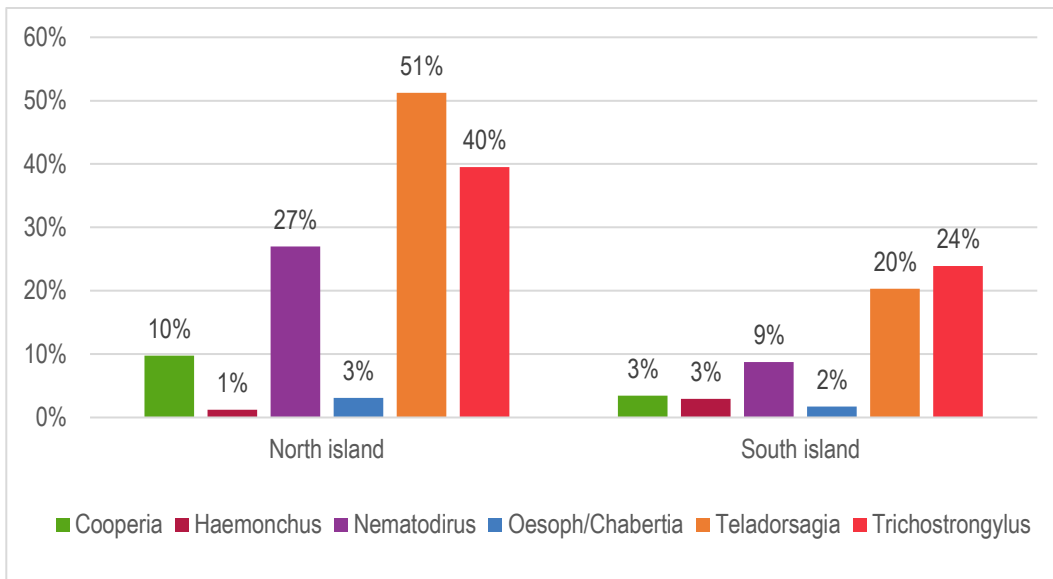


Table 2: Total number of nematode data points analysed from sheep FECRTs submitted to Gribbles Veterinary laboratories for the North Island and South Island of New Zealand during 2021-2022 stratified by test anthelmintic.

Anthelmintic	North Island	South Island
BENZIMIDAZOLE	94	253
LEVAMISOLE	166	272
BZ/ LEVAMISOLE	23	28
IVERMECTIN	26	2
ABAMECTIN	109	191
MOXIDECTIN	85	73
ABAMECTIN/ DERQUANTEL	123	152
ABAMECTIN/ MONEPANTEL	52	53
ABAMECTIN/ LEVAMISOLE	354	482
ABAMECTIN/ OXFENDAZOLE	30	56
TRIPLE	292	356

Table 3: Total number genus data points analysed from sheep FECRTs submitted to Gribbles Veterinary laboratories for the North Island and South Island during 2021-2022 stratified by location.

Genus	North Island	South Island
Cooperia	267	320
Haemonchus	247	34
Nematodirus	137	320
Oesophagostomum/Chabertia	130	288
Teladorsagia	277	458
Trichostrongylus	296	498

Analysis from the FECRT data obtained across the Gribbles Veterinary network for the season 2021-2022 shows a rapid rise in the prevalence of anthelmintic resistance in dual- and triple- active drench categories when compared with the previous report in 2016-2017 (McKenna, 2018). The landscape of anthelmintic resistance is continuously changing, due in part to the variation of active combinations available and in use. Gribbles Veterinary is therefore committed to providing this analysis report on an annual basis to track the prevalence trends on a nationwide level.

Accurate trend reporting is dependent on accurate data. The more FECRT data that Gribbles produces, the more detailed and true this trend reporting can be. In order for results to be considered for this report, the pre- and post-drench FEC and larval cultures must be tested within the Gribbles network of laboratories. This is to ensure the quality of the testing is guaranteed, as all Gribbles locations are IANZ accredited.

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Reference:

McKenna PB. Update on the prevalence of anthelmintic resistance. *VetScript* 31: 46–47, 2018.

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