

White drench resistance in *Nematodirus battus*

A study is underway to identify the scale of resistance in the *Nematodirus battus* parasite to white drenches.

Nematodirus battus is a roundworm that infects young lambs, typically 6-8 weeks old, and can affect their health and performance. In acute cases it causes severe diarrhoea, leading to dehydration then death in heavily infected animals.

Nematodirus battus eggs are deposited in faeces in spring or summer and develop into infective larvae inside the egg within a few weeks, but do not hatch onto grass until the following spring. As the larvae develop inside the egg, they are protected from adverse conditions and very high numbers survive, leading to infection when animals graze contaminated pasture. Acute disease occurs when hatching coincides with the grazing of young lambs.

Nematodirus is usually controlled by drenching lambs with a Benzimidazole (white drench; 1-BZ) in spring/early summer. Anthelmintic resistance to white drenches was identified in *Nematodirus* in 2010, but at the moment, little is known about the extent of the resistance. Due to the acute nature of disease caused by the parasite, treatment failure could have a profound impact on production in young lambs.

Other roundworm species including *Teladorsagia circumcincta* and *Trichostrongylus* spp have developed widespread resistance to anthelmintics and many farmers will be familiar with the need to know which drenches work on their farm. *Nematodirus*, however, has been much slower to develop resistance which is why Benzimidazole is still effective for this parasite when it may not be suitable for use later in the season when the other roundworm species are more common.

Funded by AHDB Beef & Lamb, Lynsey Melville, a PhD student at the Moredun Research Institute is conducting a study into white drench resistance in *Nematodirus* populations throughout the UK. To assess the situation in Wales, samples will be collected by Farming Connect's Demonstration Network farms and full results of resistance gene analysis will be returned to farmers.

The study aims to provide an overview of the current scale of resistance in *Nematodirus*. Analysis of 200 farms from across the UK found resistant genes in 50 populations of *Nematodirus*, although few had enough resistant genes likely to cause clinical drug failure. However, intensive or incorrect use of white drenches could lead to higher levels of resistant genes, which could affect drug efficacy in the future. White drench resistant genes were found to be widely distributed throughout the UK and further research will investigate the cause of this apparent localisation.

The project will also investigate the potential risk factors associated with the development and spread of resistance in *Nematodirus battus*. Research is being carried out into the changing behaviour patterns of *Nematodirus*, which is being reported later in the season, and with secondary



FARMING
connect
cyswllt
FFERMIO

peaks of disease in the autumn. Also, a questionnaire will be sent to farmers to gather information on management and treatment strategies, which could be potential risk factors in the development of resistance.

The project also aims to develop a novel, rapid test to identify white drench resistant genes in *Nematodirus* populations. Unidentified resistance could lead to treatment failures, production losses and potential lamb deaths. This test could be useful in assessing treatment decisions and evaluating the need for alternative treatment strategies.

Within the next two years of the project it is hoped to gain a greater understanding of the parasite and the driving force behind the emerging resistance. This will inform future best practice advice which in turn has the potential to minimise production and economic costs associated with anthelmintic resistance.