

Environmental impacts of equine parasiticide treatment

Callum Haseler¹, Julia Shrubbs², Hannah Davies³, David Rendle⁴, Polly Rathbone⁵, and Tim Mair⁶

¹Rossgates Equine Hospital and Diagnostic Centre

²Ashbrook Equine Hospital

³University of Surrey

⁴EMT Consulting

⁵Blackdown Equine Clinic

⁶Bell Equine Veterinary Clinic

August 9, 2023

Abstract

Whilst there are limited data on the environmental impact of administering parasiticide drugs to horses, evidence from other species treated with identical drugs indicates significant negative ecological effects. Anthelmintic drugs may be excreted unchanged or metabolised to other active and/or toxic metabolites that enter the environment through direct excretion during grazing. These chemicals can have significant toxic effects on non-target insects, such as dung beetles, earthworms and aquatic animals. Of the anthelmintics frequently used in horses, ivermectin appears to be the most ecotoxic; available evidence indicates that moxidectin is less toxic. Fenbendazole appears to have little impact on dung-colonising insects but may be toxic to aquatic organisms and fungi. There is very little data regarding the ecotoxicity of pyrantel and praziquantel, although their ecotoxic effects are thought to be low. Pasture hygiene reduces pharmaceutical contamination and also helps to break the endoparasitic cycle of infectivity, thus reducing reliance on anthelmintics. Judicious use of endoparasiticides, along with pasture hygiene measures, will limit the ecotoxic effects of these drugs and reduce the selection pressure that drives anthelmintic resistance. Anthelmintics may also impact the equine gastrointestinal microbiota. Following topical treatment with ectoparasiticides (such as fipronil, permethrin or cypermethrin), there is a risk of contamination of both the immediate environment and water courses. The half-life of fipronil in the environment is variable, but it degrades into compounds which are more toxic; it is highly toxic to bees, and is reported to bioaccumulate in fish and can be toxic to birds. Of the synthetic pyrethroids, permethrin degrades at a faster rate than cypermethrin and may therefore have a lower ecotoxic effect. The ecotoxic effects of injectable doramectin are likely to be similar to oral ivermectin, although persistence in faeces may be significantly prolonged compared to the oral treatment route.

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