



## Ivermectin vs. Moxidectin Use in Equines: Current Research and Recommendations

Since its introduction as an equine dewormer in the U.S. in 1997, moxidectin has been represented as having 2 major advantages over ivermectin equine dewormers: Longer fecal egg suppression (84 days vs. 56 days) and Effectiveness against encysted small strongyles (cyathostomes).

However, data from a study on 14 horse farms, involving 363 horses, in Kentucky, has shed new light on these claims. In a study conducted between 2007 and 2009 in central Kentucky, it was shown that the egg suppression rate for ivermectin-treated and moxidectin treated horses was **essentially the same**.<sup>1</sup> In both groups, strongyle eggs were identified in the horses' feces around 4 weeks after treatment, making both compounds equal in their egg suppression performance.

This finding is logical, considering that both compounds are macrocyclic lactones (MLs) and share the same mechanism of action: The principal mode of action of MLs is binding to gamma-aminobutyric (GABA) and glutamate-gated chloride channels, causing paralysis and death of the parasite. It is interesting to note that it took ivermectin 19 (1983 to 2002) years to develop resistance, whereas it took moxidectin only 8 (1995 to 2003) years.<sup>2</sup> **Based upon the Kentucky study, both compounds appear to be par in their egg suppression abilities.**

Current deworming recommendations, by well-known parasitologists, in horses include the conservation of **refugia** (a susceptible population of parasites), so that the rate of resistance formation to certain antiparasitical compounds, or classes of compounds, is slowed down.<sup>3</sup> Some parasitologists have suggested that encysted small strongyles represent a potential refugia source for pastures and are important in maintenance of a mixed population of susceptible and resistant parasites, casting doubt on the advantage of a compound effective against encysted strongyles.<sup>4</sup> **No studies have demonstrated an advantage, physically or physiologically in the horse, of compounds which kill already-encysted cyathostomins vs those which do not.**

Based upon label claims, ivermectin dewormers have a broader range of activity than moxidectin, most notably in species and instars of bot fly larvae (*Gastrophilus* spp.) and lungworms (*Dictyocaulus* spp.) controlled (label comparison).

This information demonstrates how ivermectin equine dewormers are still an effective choice for equine owners, especially when compared to moxidectin-containing products.

### References:

- <sup>1</sup> Lyons ET, Tolliver SC, Collins SS, Ionita M, Kuzmina TA, Rossano M, *Parasitology Research* 2011, **108**:355-360
- <sup>2</sup> Kaplan R, Presentation, FDA Public Meeting to Discuss Antiparasitic Drug Use and Resistance in Ruminants and Equines, 2012.
- <sup>3</sup> van Wyk JA, Hoste H, Kaplan RM, Besier RB. Targeted selective treatment for worm management – how do we sell rational programs to farmers? *Vet Parasitol.* 006;139(4):336-346.
- <sup>4</sup> Eng JKL, Blackhall WJ, Osei-Atweneboana MY, Bourguinat C, Galazzo D, Beech RN, Unnasch TR, Awadzi K, Lubega GW, Prichard RK, *Molecular & Biochemical Parasitology* 2006, **150**:229-235

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