

SUMMARY

Approach to the evaluation of reduced anthelmintic effectiveness in horses

Key words: anthelmintic resistance; horse; FECRT; ERP; EHT; NGS

In Italy parasite control strategies in horses are still largely based on strategic deworming involving rotational treatment at regular intervals. This practice can select for anthelmintic drug resistance in *Cyathostomum* and *Parascaris* spp. populations. Resistance has been documented in major horse and donkey nematode parasites. Horse stables with high stocking density and extended time on pasture, referring history of high frequency in deworming treatments have been considered for Fecal Egg Count Reduction Test (FECRT) and other exams if needed.

FECRT and Egg Reappearance Period (ERP) have been performed following AAEP Parasite Control Guidelines; Egg Hatch inhibition Test (EHT) has followed the protocols described by von Samson-Himmelstjerna et al. (2009); Next Generation amplicon Sequencing (NGS) procedure has been set up for eggs and larvae identification.

FECRT did not show resistance in treatments performed with macrocyclic lactones (ivermectin and moxidectin). ERP confirmed this result for ivermectin. Instead pyrantel treatments proved resistant on 13% of tested horses based on FECRT results. Fenbendazole use, following FECRT specific cutoff value, resulted in resistance for 43% of the samples and suspected resistant for another 43%. In a group of horses held in extensive systems with no use of parasite control programs, the FEC and coproculture revealed the presence of *Strongylus vulgaris* (1-5%). The EHT preliminary results confirm the FECRT ones in the tested samples but need further insights. After a protocol optimization for eggs and larvae, the same samples tested in vitro were undertaken for NGS allowing identification at family and species level.

The obtained results confirm macrocyclic lactones effectiveness in horse GI nematodes control.

For pyrantel treatments the results were not conclusive as tested horses were mostly from different stables. The horses tested for Fenbendazole, borned and raised in the same farm, included also less than 3 years old subjects, more susceptible to parasite infection.

Surely in vitro and molecular diagnostics still need to be improved for the equine parasite control but can be considered as ng in the next future for the equine health and welfare improvement.