

# SUMMARY

*Parasites control in dairy donkeys*

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**Keywords: donkey, FECRT, ERP, strategic and selective treatments.**

Parasites still represent a problem affecting health, welfare and productivity in livestock. Today the use of anthelmintic drugs has reduced clinical signs associated to parasitism but has enhanced the risk of anthelmintic resistance (AR) development. Resistance (AR) is the heritable (and therefore genetic) ability of the worm to survive a dose of anthelmintic which would normally be effective. In the donkey species very few studies have been performed on anthelmintic drugs dose and efficacy and often the treatments are performed with products approved for ruminants or horses.

The aim of the study has been to encourage the correct use of anthelmintic drugs in the donkey species to improve animal welfare, preserve molecules efficacy and environment.

A coprological survey on donkey parasites in Italy was performed. Faecal egg count reduction test (FECRT) and Egg Reappearance Period (ERP) was used to assess the effectiveness of the main anthelmintic drugs used in the donkey species: pyrantel PYR, fenbendazole FBZ, ivermectin IVM, and moxidectin MOX. A comparison between traditional strategic (STR) and targeted selective treatments (TST), that is the treatment only of individuals that would benefit most from anthelmintic (high fecal egg count FEC) took place.

The epidemiological survey involved 1775 donkeys bred in 77 farms over 13 Italian regions.

The results showed a high prevalence of gastrointestinal strongyles (GS) (84.9%) that are, like in the horse, the most represented parasite.

The 44,4% of the animals (788/1775) had a  $FEC < 300$  epg (eggs per gram) (low shedders); the 18,1% (321/1775) showed a FEC between 301 and 600 epg (mild shedders) and the 37,5% (666/1775) reached a  $FEC > 600$  (heavy shedders).

The risk factors analyses did not evidence that age, sex, body condition score (BCS), pasture, grazing with ruminants, farm size and treatment frequency represented risk factors for GS infection. On the contrary, breed, grazing with horses and donkey geographical origin were significant ( $p < 0,005$ ) risk factors for GS parasitism.

The effectiveness evaluation of PYR, FBZ, IVM, and MOX administered per os to donkeys at horse drug dosage, took place in two farms located in the centre (C) and south (S) of Italy. In farm S all the active ingredients resulted effective in the treatment of donkey GS. Also ERP results were in agreement with the guidelines reference values of efficacy. In particular, at two weeks after the treatment, PYR, FBZ, IVM, and MOX obtained a FECR of 99,3%, 99,8%, 100% e 100%, respectively.

In farm C, PYR and FBZ, at the same time post-treatment, showed a FEC of 86,3% and 83,9%, respectively. This values correspond to a suspect of anthelmintic resistance.

The 100% obtained by IVM and MOX are related to an ERP lower than the guidelines cut-off as at the 8<sup>th</sup> and 9<sup>th</sup> week post treatment the FECR is lower than 90%.

Pre-treatment coprocultures showed the presence of Cyathostominae L3 in farm S and of Cyathostominae and *Strongylus vulgaris* in farm C. After the treatments only Cyathostominae were evidenced.

The low FEC obtained for PYR and FBZ and the short ERP related to IVM and MOX in the present research, could be a consequence of frequent anthelmintic treatments associated to **extra-label use** of products for ruminants.

Those results encourage for a wider use of those tests in equine farms.

The study on the comparison between traditional strategic (STR) and targeted selective treatments (TST) lasted one year with monthly parasitological analyses and treatments with fenbendazole at the dosage of 7,5mg/kg BW following this protocol:

- Strategic group (STR n = 20) overall treatment twice per year;
- Selective group (SEL n = 21) treatment of subjects with FEC > 300 epg;
- Control group (C n = 9) no treatment during the trial.

Mean FEC during the year of study in the three groups resulted to be 201 epg in group SEL, 348 epg in the STR and 870 epg in C.

Total number of treatments resulted to be 0 for C, 3 for STR for a total of 60 and 81 in group SEL (3,9 per head).

Hematochemical and immunological parameters resulted to be **within** their normal **physiological ranges** during the studies and respecting similar trends in the experimental groups.

Those results represent preliminary data enforcing a stronger development in anthelmintic resistance studies and controls also in the donkey species. In the field of prophylaxis all strategies allowing a reduction in frequency and number of treatments are to be considered.