

RESEARCH CONFIRMS

Resistance to Panacur® PowerPac (*fenbendazole*) in the United States is widespread while QUEST® (*moxidectin*) remains effective for controlling the most common equine parasites.¹

Comparison of a single dose of moxidectin and a five-day course of fenbendazole to reduce and suppress cyathostomin fecal egg counts in a herd of embryo transfer-recipient mares

OBJECTIVE:

To compare the two approved larvicidal regimens for the treatment and control of cyathostomins for reduction and suppression of fecal egg counts (FEC) in a transient herd of embryo transfer-recipient mares.

PROCEDURES:

- Study qualifying mares were randomized via complete block design into 2 treatment groups:
- Group 1 received a single dose of QUEST®, Group 2 received Panacur® PowerPac (PPP).
- FEC data were analyzed 14, 45 and 90 days following treatment.

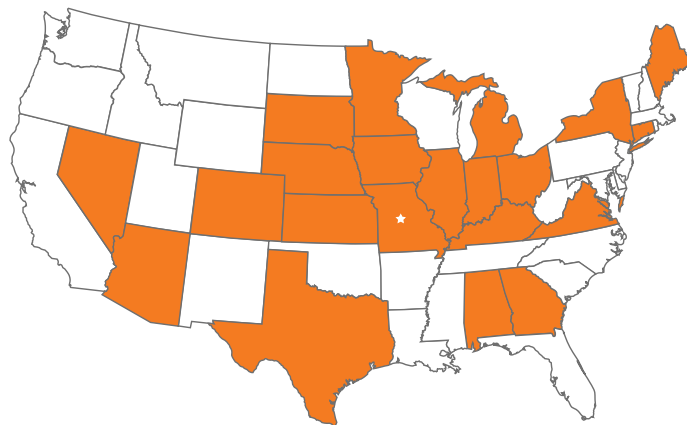
RESULTS:

- Mean FEC reduction was 99.9% for moxidectin treated mares and 41.9% for fenbendazole treated mares 14 days post-treatment.
- By 45 days, fenbendazole group mean FEC exceeded pre-treatment levels and were 10x those of moxidectin.
- Moxidectin group mean FEC levels remained suppressed throughout the study. Statistically significant FEC differences were observed between groups 14, 45 and 90 days post-treatment.

CONCLUSIONS:

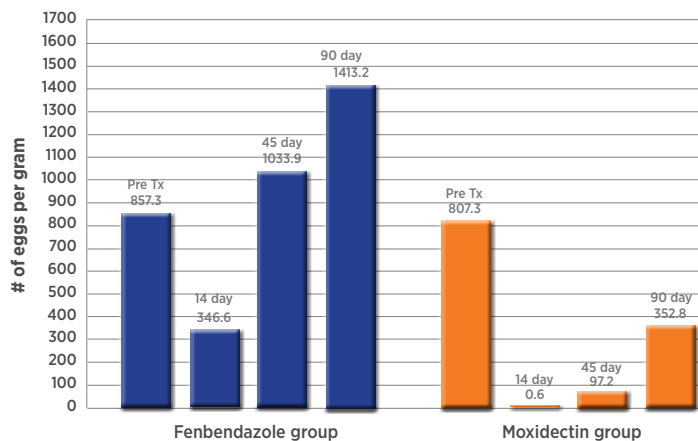
- Failure of the 5-day regimen of fenbendazole to adequately reduce or suppress FEC suggested inadequate adulticidal and larvicidal effects.
- In contrast, a single dose of moxidectin effectively reduced and suppressed FEC for an extended period.
- Given the diverse geographic origins of study mares, these results are likely representative of cyathostomin-infected mares in much of the United States, confirming previous findings indicating that fenbendazole resistance in cyathostomins is widespread and that moxidectin remains an effective treatment for control of these important parasites.

GEOGRAPHIC ORIGINS OF RECIPIENT HERD



At the time of the study initiation, the resident herd was composed of 120 individual mares that had arrived from the 21 states highlighted within the previous 16 months. There is no history of fenbendazole or moxidectin use on the farm.

MEAN FECAL EGG COUNTS



One dose of QUEST® (*moxidectin*) was more than 2x as effective as Panacur® PowerPac (*fenbendazole*) in reducing fecal egg counts and without intestinal inflammation.³

Characterization of the inflammatory cytokine response to anthelmintic treatment in ponies

OBJECTIVE:

Because anthelmintic treatments have been associated with intestinal reactions³ and these inflammatory reactions may play a role in the development of parasitic disease post anthelmintic treatment (larval cyathostomiasis)⁴, this study was developed to determine the effect of different anthelmintic classes on the proinflammatory response post treatment.

PROCEDURES:

- Ponies were divided into 4 treatment groups: Group 1 (n=4) were untreated controls; Group 2 (n=5) received 5 daily doses of fenbendazole (10 mg/kg bwt); Group 3 (n=4) received daily treatment of pyrantel tartrate 2x (2.65 mg/kg bwt); and Group 4 (n=5) received a single dose of moxidectin (400 g/kg bwt).
- Blood samples were collected daily for 2 weeks to determine the effect of deworming on proinflammatory gene expression.
- Fecal egg counts were used to evaluate the efficacy of each drug.

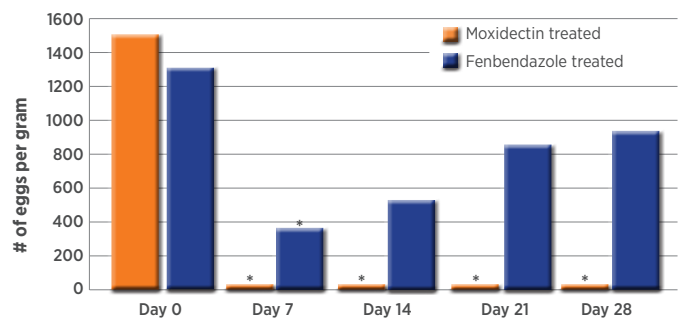
RESULTS:

- While treatment with Panacur® PowerPac (PPP) was the least successful in reducing fecal egg counts, it stimulated the most pronounced systemic proinflammatory cytokine gene expression.
- Treatment with pyrantel salt also reduced fecal egg counts with less of a proinflammatory response.
- Treatment with QUEST was the most successful in reducing fecal egg counts and produced no signs of increased proinflammatory cytokine expression.

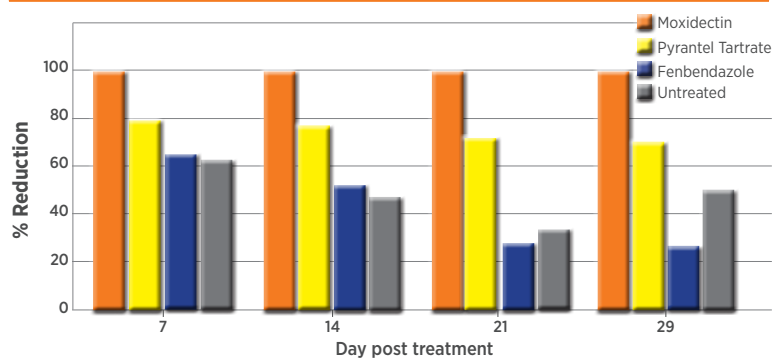
CONCLUSIONS:

- There are pronounced differences in the inflammatory cytokine responses to anthelmintic treatment.
- QUEST successfully reduced FEC without producing signs of inflammation, whereas PPP failed to adequately reduce FEC and stimulated proinflammatory gene expression.
- Such inflammatory reactions may play a role in the development of parasitic disease post anthelmintic treatment.

GEOMETRIC MEAN FECAL EGG COUNTS [Significance (*) based on pre-treatment counts]



FECAL EGG COUNT REDUCTION POST TREATMENT



Do not use QUEST Gel or QUEST PLUS Gel in foals less than 6 months of age or in sick, debilitated and underweight horses. These products should not be used in other animal species, as severe adverse reactions, including fatalities in dogs, may result.

¹Mason ME, Voris ND, Ortis HA, Geeding AA, Kaplan RM. Comparison of a single dose of moxidectin and a five-day course of fenbendazole to reduce and suppress cyathostomin fecal egg counts in a herd of embryo transfer-recipient mares. *J Am Vet Med Assoc.* 2014;245.

²Betancourt A, Lyons ET, Horohov DW. Characterisation of the inflammatory cytokine response to anthelmintic treatment in ponies. *Equine Vet J* 2014; DOI: 10.1111/evj.12280

³Steinbach T, Bauer C, Sasse H, Baumgartner W, Rey-Moreno C, Hermsilla C, Damiyasa IM, Zahner H. Small strongyle infection: consequences of larvicidal treatment of horses with fenbendazole and moxidectin. *Vet Parasitol* 2006; 139:115-131.

⁴Reid SW, Mair TS, Hillyer MH, Love S. Epidemiological risk factors associated with a diagnosis of clinical cyathostomiasis in the horse. *Equine Vet J* 1995;27:127-130.