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Research paper

Parasite control strategies used by equine owners in the United States: A national survey

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ABSTRACT

The widespread occurrence of anthelmintic resistance in equine parasites across the world has led to recommendations of fecal egg count-based parasite programs to reduce treatment intensity and thereby delay further development of resistance as much as possible. The most recent study describing equine parasite control in the United States was conducted 20 years ago, and little is known about current strategies employed. This study was part of the National Animal Health Monitoring Systems (NAHMS) Equine 2015 Study, and aimed to describe equine parasite control strategies in the U.S. and evaluate to which extent respondents were in compliance with current guidelines. The study was carried out in 28 states, representing 70.9% of all equine operations with at least five equids present. Two questionnaires were administered, either by mail or delivered in person by veterinary medical officers. Participants provided specific details of their operation and were asked questions about strategies for anthelmintic therapy and diagnostic testing. A total of 380 operations provided data regarding their parasite control practices. Most respondents dewormed 2–3 times a year with ivermectin being the most commonly used anthelmintic. About 22% of respondents used fecal egg counts (FEC) in some form, with less than 10% using them on a regular basis. Less than 5% made use of fecal egg count reduction tests (FECRT). These results suggest little change since the last nationwide survey was conducted in 1998, as the majority of respondents did not report using FECs. This is in stark contrast to recent European surveys, where 50–60% of respondents were using FECs routinely. However, the anthelmintic treatment intensity appears to have been lowered compared to 1998. Taken together, these results suggest a continuing need for education and outreach regarding sustainable parasite control.

1. Introduction

Equine parasite control programs have been subject to much scrutiny in recent years given the widespread occurrence of anthelmintic resistance in important parasites such as cyathostomins and ascarids (Peregrine et al., 2014; Nielsen, 2016). Recommendations are now aiming at reducing treatment intensity to decrease the rate of resistance development as much as possible (Kaplan and Nielsen, 2010). The concept of selective anthelmintic treatment was first suggested as a strategy for controlling equine cyathostomin parasites about 30 years ago (Duncan and Love, 1991; Gomez and Georgi, 1991) and is based on determining parasite fecal egg counts (FEC) from all equids within a given population, and then treating those that are exceeding a pre-determined threshold. This approach reduces anthelmintic treatment

intensity markedly, while still maintaining an overall reduction of fecal egg shedding within the herd (Kaplan and Nielsen, 2010). Despite these early recommendations, however, a majority of questionnaire surveys documented that the main approach for equine parasite control around the world continued to be based on frequent treatments applied with fixed intervals year-round with little or no inclusion of diagnostic surveillance (USDA, 1999; Lloyd et al., 2000; Matthee et al., 2002; O'Meara and Mulcahy, 2002). In 2013, the American Association for Equine Practitioners (AAEP) published a set of guidelines for equine parasite control (Nielsen et al., 2013). These guidelines are aimed at lowering anthelmintic treatment intensity through usage of FEC monitoring to identify equids in need of treatment for reduction of cyathostomin egg shedding and by ensuring an inclusion of strategic treatments to maintain control over other parasites of interest, such as

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Table 1

Anthelmintic treatment frequency presented as percentage (Pct) of operations that dewormed resident equids of that equine type by the specified number of times, in the previous 12 months. Equids maintained on a daily deworming schedule were excluded from this presentation.

Equine category	Percent operations Deworming frequency category (times in last 12 months)							
	1		2–3		4–6		7 or more	
	Pct	SE	Pct	SE	Pct	SE	Pct	SE
> 6 months	32.8	8.7	44.9	8.6	20.7	5.8	1.5	1.5
6–23 months	15.8	5.4	39.8	6.7	41.6	7.1	2.8	1.4
Broodmares	16.2	4.7	46.9	5.3	34.8	4.9	2.1	1.1
Stallions	17.4	5.6	47.6	6.6	33.3	6.1	1.8	1.1
2–3 years ^a	16.6	4.4	45.7	5.3	35.3	5.0	2.5	1.7
4+ years ^a	8.1	1.9	56.2	3.4	32.2	3.1	3.5	1.5

^a Stallions and broodmares excluded.

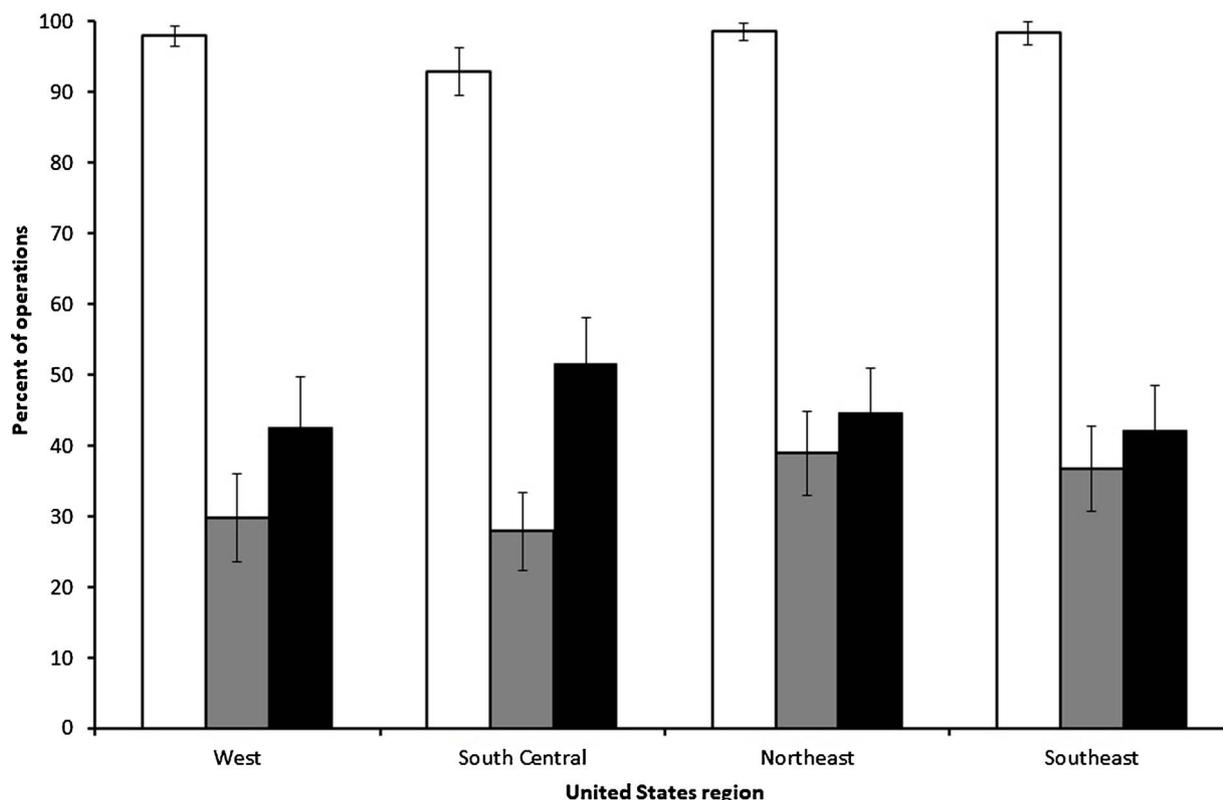


Fig. 1. Percent of operations using macrocyclic lactones (white columns), pyrimidines (gray columns), and benzimidazoles (black columns) for resident equids in the previous 12 months by respondents in the four regions of the United States. West: Arizona, California, Colorado, Montana, Oregon, Wyoming, South Central: Arkansas, Kansas, Missouri, Oklahoma, Texas, Northeast: Connecticut, Delaware, Maryland, Massachusetts, Michigan, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Wisconsin, and Southeast: Alabama, Florida, Kentucky, North Carolina, Tennessee, Virginia. Respondents were allowed to select more than one drug class. Error bars represent standard errors.

large strongyles, ascarids, and tapeworms. Furthermore, the guidelines recommend routine evaluation of anthelmintic treatment efficacy with the fecal egg count reduction test (FECRT). These guidelines are considered today’s gold standard for equine parasite control in North America, but it remains unknown to which extent they are being followed.

Recent European surveys have reported signs of a changing approach towards deworming with an increasing use of FEC monitoring and reduced treatment intensity in countries such as Germany (Hinney et al., 2011) and the United Kingdom (Stratford et al., 2014). In North America, however, there is no recent information on parasite control strategies used. A National Animal Health Monitoring Systems (NAHMS) survey conducted in 1998 (USDA, 1999) described parasite control strategies applied by US equine owners 20 years ago. This survey found that less than 5% of respondents made routine use of

FECs, and half of them dewormed their adult equids at least four times a year (USDA, 1999). No nation-wide survey has been conducted in the United States since. In one recent survey specifically focusing on the Thoroughbred industry in Kentucky in 2013 about 25% of respondents based their treatment decisions on routine FECs, but mean treatment intensities were in the 5–7 treatments per year range across age categories (Robert et al., 2015). However, the Thoroughbred industry is characterized by distinct management schemes, which may not resemble those of equine establishments belonging to other breeds and disciplines. Thus, extrapolation to the broader U.S. equine owner population is not justified.

The present study was conducted as part of the NAHMS Equine 2015 Study. The aims were to describe current strategies for equine internal parasite control as applied by U.S. equine owners, and to evaluate to which extent the AAEP equine parasite control guidelines

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