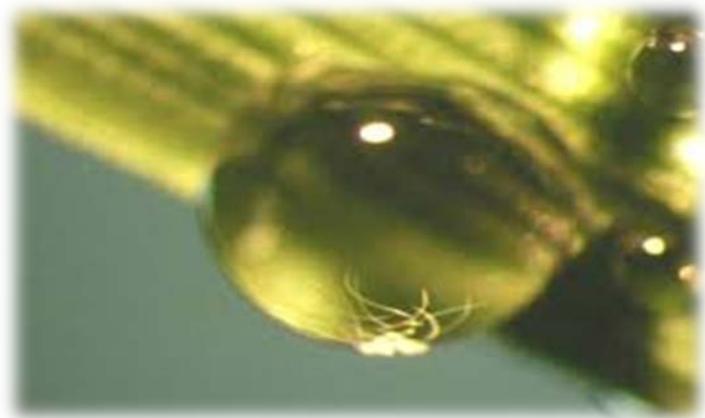


Managing Parasite Resistance Using A Whole Farm Approach

Module 4. The Results of the Penn State Parasite Resistance Project and What it Means for You



Penn State **Extension**

The “New” Protocol in Parasite Management

- *Use products with proven efficacy*
- *Administer at the appropriate time of the year*
- *Deworm based on the parasite burdens of individual horses*

The question you need to ask is what are you most afraid of – allowing your horses to retain some parasites or developing anthelmintic resistant parasites that can no longer be killed.



Changing Minds One at a Time

“By now virtually every equine veterinarian in this country knows that regularly scheduled, across the board deworming is a bad idea. And I know many horse people do as well. But how many people have acted on this information and changed their approach to parasite control. Not nearly enough.”

Dr. Martin Nielsen , DVM< PhD, DECK, DACVM quoted in Equus magazine

Penn State Parasite Project Goals

- * To empower farm managers to make changes in their parasite management program in order to reduce the overuse of dewormers that leads to product resistance.
- * To document levels of parasite burdens and product resistance on PA horse farms.



Eliciting Change.....

“In order to empower horse owners to make changes to their deworming program it is necessary to provide them with the knowledge and skills necessary to be confident that they are making good management decisions.”

1. Developed a comprehensive short course offered statewide: *Reducing Parasite Resistance Using a Whole Farm Approach* - attended by 287 farm managers.



2. Engaged farm managers in a project designed to **monitor farm specific strongyle egg production**, identify “shedders” and **evaluate product efficacy** by conducting pre and post deworming egg count.

3. Supplied microscopes and supplies and hosted “manure” parties every eight weeks at predetermined sites.

Funded by \$146,000 SARE grant.



PARACOUNT-EPG™ Fecal Kit
for modified McMaster technique

- 2 McMaster slides (standard grid*)
- 2 mixing vials
- 2 lb transfer syringes
- Instructions
- Compact case
- * green grid slides optional at additional cost



Determining Product Resistance

Fecal Egg Count Reduction Test

1. Conduct egg count
2. Deworm
3. Conduct egg count 14 days later, determine % reduction

$\% \text{ FECR} = \text{FEC before deworming} - \text{FEC post deworming} / \text{FEC before deworming} \times 100$

- Resistance occurs at the farm level - at least 3 horses should be included in a FERT and results should be averaged.
- Pyrantel and benzimidazoles should show at least a 90% reduction.
- Ivermectin and moxidectin should show a reduction of at least 95%.

Sample - Fecal Egg Count Reduction Test Windy Hill Farm

Product – pyrantel

Date of fecal egg count – 7/1

Date dewormed – 7/2

Date of recheck – 7/15

Horse	FEC before deworming	FEC after deworming	% reduction
Ghost	1475	562	61%
Lucky	2350	450	80%
Deli	650	300	54%
Rocky	1800	2350	0%
Fred	475	125	<u>74%</u>

Farm average – 53.8%

Project Results

- In 2015 and 2016, 74 horse farms, representing 711 horses in 23 Pennsylvania counties were enrolled as partners in the research project.
- Data from 53 farms was used to determine the reduction in use of dewormers. Prior to participating in the project, the 53 horse owners dewormed 1,992 times per year. Using surveillance-based deworming principles, deworming was reduced to 727 times a year – a reduction of 1,265 times.

Farm Partner Survey Results

- 100% were able to identify high shedders
- 95% were able to identify horses with good immunity against small strongyles
- 95% were able to identify products that were viable on the farm
- 81% reduced the use of dewormers
- 100% had increased confidence in surveillance based deworming
- 100% planned to continue to use FECs in their deworming program
- 68% adopted practices to improve pastures to reduce parasite exposure
- 45% removed manure from pastures
- 79% stopped harrowing pastures or restricted harrowing to fall.
- 97% *remained in the project throughout the monitoring period.***

Dewormer Resistance on PA Farms Pyrantel

	2015	2016	Total
Number of farms	52	22	74
*Farms with no horses at deworming threshold	14 (27%)	5 (23%)	19 (26%)
*Farms at deworming threshold	38 (73%)	17 (77%)	55 (74%)
** Qualified farms	20 (38%)	9 (41%)	29 (39%)
***Farms showing reduced efficacy	16 (80%)	6 (67%)	22 (76%)
****Farms showing product efficacy	4 (20%)	3 (33%)	7 (24%)

* 300-500 eggs per gram

** Farms with 3 or more horses that were moderate or high shedders

***Farm average egg shedding was reduced less than 90%

****Farm average egg shedding reduction was at least 90%

Dewormer Resistance on PA Farms Fenbendazole

	2015	2016	Total
Number of farms	52	22	74
*Farms with no horses at deworming threshold	28 (54%)	8 (36%)	36 (49%)
*Farms at deworming threshold	24 (46%)	14 (64%)	38 (51%)
** Qualified farms	11 (21%)	10 (45%)	21 (28%)
***Farms showing reduced efficacy	11 (100%)	9 (90%)	20 (95%)
****Farms showing product efficacy	0 (0%)	1 (10%)	1 (.05%)

* 300-500 eggs per gram

** Farms with 3 or more horses that were moderate or high shedders

***Farm average egg shedding was reduced less than 90%

****Farm average egg shedding reduction was at least 90%

Dewormer Resistance on PA Farms Ivermectin

	2015	2016	Total
Number of farms	52	22	74
*Farms with no horses at deworming threshold	23 (44%)	5 (23%)	28 (38%)
*Farms at deworming threshold	29 (56%)	17 (77%)	46 (62%)
** Qualified farms	13 (44%)	9 (41%)	22 (30%)
***Farms showing reduced efficacy	0 (0%)	0 (0%)	0 (0%)
****Farms showing product efficacy	13 (100%)	9 (100%)	22 (100%)

* 300-500 eggs per gram

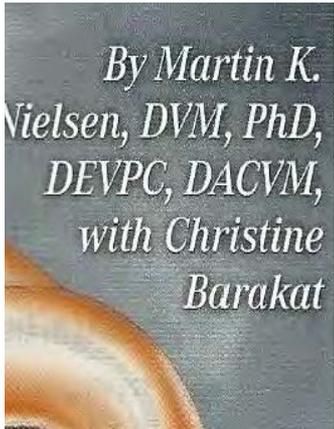
** Farms with 3 or more horses that were moderate or high shedders

***Farm average egg shedding was reduced less than 95%

****Farm average egg shedding reduction was at least 95%

Equus Magazine

In fact, I am currently involved in a project in Pennsylvania, where the extension service received a three-year grant to disseminate information about surveillance-based parasite-control programs. The group reached out to me to help them implement a plan, and I was happy to travel to educate extension officers in various regions around the state on how to do egg counts and direct horse owners toward the best practices. This initiative and energy will change a lot of things in that state for the better. I think that could be a fabulous model for other states. If Pennsylvania can do it, why not Kentucky? Why not every state?



*By Martin K.
Nielsen, DVM, PhD,
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Barakat*

Project Conclusions

- Most PA horses in the study were low shedders and consistently shed low or no eggs. High shedders tended to remain high and needed to be strategically dewormed.
- There is reduced efficacy and seems to be significant resistance to Pyrantel and Fenbendazole on Pennsylvania farms.
- It is critical for horse owners to use a comprehensive approach to manage parasites to reduce the rate of resistance development.
- Farm managers will adopt changes to their parasite management program when they have the knowledge and tools necessary to make those changes.

We are very grateful for the dedication of all of our farm partners who were truly committed to the project and the research that benefited their horses and the equine community. The bond of trust that is generated in working together and the strong relationships that develop along the way is priceless.



Next Module

How to Conduct Your Own Fecal Egg Counts



This project is partially funded by:



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