

## Anthelmintic Resistance

Anthelmintics, also known as “dewormers,” are critical for the control of parasites. Similar to antibiotic resistance, parasites are adapting to modern control methods. Anthelmintic resistance is increasing at an alarming rate. Due to a lack of financial incentive, pharmaceutical companies are not developing new anthelmintics. In short, what we have is what we have. With no new drugs being produced, it is important to conserve the ones currently available. As parasites adapt so must our thinking.

In order to slow the rate of resistance our method of control must change. Current recommendations are twofold; 1) environmental management and 2) targeted use of anthelmintics.

### Environmental Management

Reducing pasture contamination is necessary to minimizing parasite exposure. Managing manure properly will reduce pasture contamination. This can be accomplished by removing manure from the pasture or mowing/dragging pastures to scatter feces. By reducing the parasite load on the pasture, exposure is minimized

### Targeted Use of Anthelmintic

Deworming based on the calendar is no longer a sustainable practice. Knowledge of the biology of the parasite and its transmission is necessary for control. The goal is to get the correct drug to the correct horse at the correct time. The old adage, “you can’t manage what you can’t measure” holds true. The only way this can be accomplished is by performing routine fecal egg counts.

Fecal Egg Counts (FEC) are currently the best method of estimating worm burdens in horses. FEC are easily performed and provide a tremendous amount of information necessary for parasite control. It is important to understand not all horses carry the same amount of parasites. The 80/20 rule typically holds true, 20% of the horses shed 80% of the eggs. Horses can be grouped based on the number of eggs per gram (EPG) being shed in the feces.

- High egg shedders  $\geq 500$  EPG
- Moderate egg shedders 200- 500 EPG
- Low egg shedders  $\leq 200$  EPG

By identifying high egg shedders within a population, control methods can be implemented to reduce pasture contamination and minimize resistance.

Fecal egg counts also provide valuable information needed to determine resistance patterns on a particular farm. Resistance is determined based on Egg Reappearance Period (ERP). When anthelmintics are administered, they will continue to provide parasite control for differing lengths of time depending on the drug used. The ERP is the length of time it takes for eggs to reappear in the feces of horses after treatment. As resistance increases the egg reappearance period decreases. Factors affecting ERP include: lifecycle of the parasite, drug used, and time of year/weather conditions.

### Average Egg Reappearance Periods for Common Anthelmintics

Drug Class	Trade Name	ERP
Benzimidazole		
Fenbendazole	Panacur	4 wks
Oxibendazole	Anthelcide EQ	4 wks
Pyrantel	Strongid/Exodus	4 wks
Macrocyclic Lactone		
Ivermectin	Zimecterin/Equell	8 wks
Moxidectin	Quest	12-16 wks

### Environmental Considerations

Cyathostome eggs in feces will not hatch if temperatures are below 45°- 50° F. After hatching, L<sub>3</sub> larvae will not survive long enough for transmission to occur when temperatures are above 90° F. This limits transmission to spring and fall with only negligible transmission during the summer months in northern states. The opposite is true for southern states. Transmission will occur from fall to spring.