

# ANS 490A: Summary of Current Guidelines for Management of Internal Parasites in Horses

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## Summary and Implications

Parasite control has traditionally involved regular rotation of dewormers to treat large strongyles (bloodworms), which were the main equine internal parasite of concern in the past. The treatment was effective, and today, large strongyles are a rare occurrence in horses. Many horses no longer require frequent treatment for parasite control. Today, the most significant parasite infection in adult horses has changed from large strongyles to small strongyles. The roundworm, or ascarid, continues to be the primary concern in foals and yearlings. New recommendations are available for improved management of parasites in horses. These recommendations aim to treat and maintain parasitic infection at a threshold where it does not cause physical illness to the animal. With the past practice of regular rotation, parasites began to develop resistance to all the available types of dewormers. Today, there is evidence which indicates that dewormers are losing effectiveness in treating internal parasite infections. The aim of current recommendations is to reduce the spread of resistance, avoid physical illness in horses, and to limit parasite egg shedding in horse populations. Implementing a parasite management plan requires a general understanding of parasites, dewormers, and resistance. This paper aims to explain these terms for horse owners so they can build an effective management plan in treating parasites in horses while mitigating resistance to dewormers.

## Introduction

The American Association of Equine Practitioners (AAEP) has created detailed recommendations for a parasite control program in horses of all ages and put together a paper for reference titled “AAEP Internal Parasite Control Guidelines” ([https://aaep.org/sites/default/files/2021-03/Internal\\_Parasite\\_Guidelines.pdf](https://aaep.org/sites/default/files/2021-03/Internal_Parasite_Guidelines.pdf)). This Animal Industry Report aims to summarize the AAEP’s Internal Parasite Control Guidelines for horse owners and provide a tactical treatment plan. Information and most tables are modified representations of AAEP’s published guidelines.

Guidelines are specified in accordance with age group (adult horses and horses younger than 3 years of age) and infection status. The present recommendations are based on identifying the type(s) of parasite(s) and the number of

parasites present, then selecting an effective dewormer for each individual as needed. The recommendations also provide guidance in timing of treatment and monitoring effectiveness of the drug on individual farms. It is crucial to keep in mind that the main goal of treatment is to prevent resistance while also targeting internal parasites that may become a source of clinical illness in the animal.

## Materials and Methods

Internal parasites of significant concern today can include small strongyles, roundworms, and tapeworms, which are mainly acquired from being on pasture. Horses that become infected may show signs of infection such as a dull haircoat, big belly, colic, or lethargy. It is important to note that individuals will be affected differently by the infection, and knowing how to treat it will be the best way to maintain the infection at a minimum.

To begin an improved parasite management plan, it should be first determined if the horse is a high, moderate or low shedder. Egg shedding status is determined by performing a fecal egg count (FEC) and reporting findings in eggs per gram (EPG). A step-by-step guide can be referred to in Table 2. A FEC is executed by counting the number of eggs present in a designated area of a McMaster slide, then using the appropriate calculations to obtain the EPG. Materials needed to perform a FEC can be found in Table 1. These procedures do not require extensive training, but they do require a general understanding of what parasite eggs look like, and an understanding of the laboratory techniques necessary to calculate the number of parasite eggs found per gram of feces. Another option is to provide the farm’s veterinarian with a fecal sample from which they may calculate the EPG of the individual.

Horses can be classified as high shedders when more than 500 EPG are identified in the fecal (manure) sample. Moderate shedders have 200-500 EPG and low shedders will be those animals that contain 0-200 EPG in a sample. Reference pictures for identifying roundworm (A) or strongyle (B) eggs can be found in Figure 1.

The plan for treatment is based on the infection status and the age group. A veterinarian should be consulted in building a parasite control treatment plan. High shedding individuals are recommended to be treated 4 times per

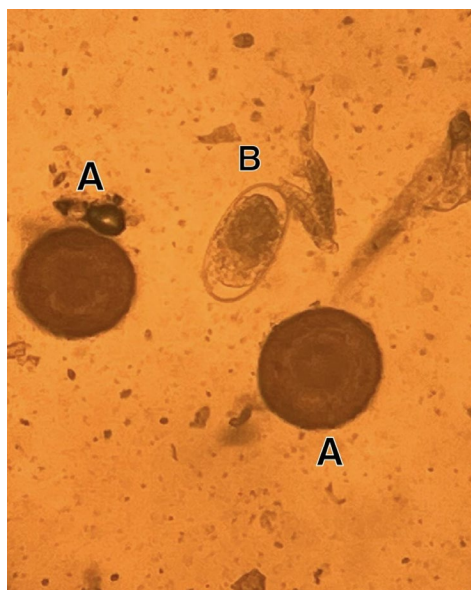


Fig. 1: Roundworm (A) and strongyle (B) eggs under microscope (A. Carlo)

year, moderate shedders 3 times per year, and low shedders, 2 times per year. Preventative plans should be targeted for specific age groups on the farm and treatment is based on the type of parasite identified in each group. In mature horses, the main concern is typically strongyles while both roundworms and strongyles often infect weanlings and yearlings. Foals and yearlings are treated as high shedders. Once mature, the preventative treatment plan is based on their shedding status. FEC should be performed by 2 months of age in foals to determine the type of infection and treatment. First treatment is recommended at 2-3 months of age targeting roundworms. The second deworming is recommended before weaning, which is when another FEC is recommended, and treatment should be targeting whichever parasite is present in that second FEC. The next treatments to be carried out in the first year should be planned at 9 and 12 months of age. For foals, weanlings, and young horses, FECRT are recommended to be done once a year.

Treatments for high shedding adult animals are recommended 3-4 times per year. For younger horses (foals, weanlings, yearlings, and up to 3 year olds), it is recommended to administer 4 treatments in their first year of life, then 3-4 yearly treatments until they are considered adult horses (older than 3). There are only a few drugs to choose from when treating parasites. Strongyles should be treated with ivermectin or moxidectin, as these parasites have shown minimal signs of resistance to these anthelmintics. Roundworms may be resistant to treatment with ivermectin and should be treated with benzimidazoles to ensure effectiveness. Benzimidazoles common in equine dewormers include fenbendazole and oxbendazole. Drug names and examples of available products can be found in Table 4, with the types of parasites they can be used to treat.

FEC are recommended four weeks after the egg reappearance period (ERP). The ERP is defined in the AAEP as the “interval of last effective treatment and the resumption of egg shedding.” Moxidectin has a common ERP of 10-12 weeks. Ivermectin has an ERP of 6-8 weeks, but with resistance, it is reduced to 3-5 weeks. The ERP for deworming medications can be found in Table 5. These results express that horses will begin shedding eggs more frequently and parasites will continue developing resistance should the horse continue to be treated with the same drug. Owners can help delay resistance of drugs by not over-using the same drug for treatment and maintain a refugia population. Refugia is the population of the worms not exposed to the drug, which is crucial to limiting the resistant parasites.

To evaluate efficiency of drugs used, a Fecal Egg Count Reduction Test (FECRT) calculation can be used. This calculation is based on the EPG present on the sample before and after treatment. It is calculated by subtracting FEC pre-treatment and FEC post-treatment, and dividing it by the pre-treatment FEC to obtain a percentage for efficacy of a dewormer.

Treatment plans are a way of both maintaining infection at a threshold as well as a way of delaying resistance in the parasites. Building a farm management plan can be effective in doing that. Owners can work along with their veterinarian in limiting parasitic infection or treatment of such with careful monitoring through FEC. Resistance can occur for many reasons, such as using the same drugs for treatment, improper dosage, and even treating low shedding animals. A complete parasite control program will cover environmental management, parasite monitoring, identification, and treatment management of individuals.

## Conclusion

In summary, parasite control recommendations have changed significantly in recent years. Horse owners should familiarize themselves with current recommendations and implement targeted and preventative treatment plans when recommended. Resistance to dewormers is becoming very common, and owners should be aware of the importance of treating and getting together a plan for maximum efficiency in controlling infections. The goal with current practices is to minimize resistance and maximize the efficacy of the drugs used for deworming for as long as possible. A strategic deworming program will take into consideration the factors that affect infection status, such as age, location, climate, location, and shedding status. The purpose of this project was to provide horse owners with a guide or reference to implement new practices and bring awareness on the upcoming issue of resistance. Having access to the recent suggestions for parasite management can slow the spread of resistance to available dewormers. Internal parasites are considered to be a common burden in many farms, but understanding how to manage them and working

## Iowa State University Animal Industry Report 2024

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closely with a veterinarian to implement new practices will help in the mitigation of emerging resistance

# Iowa State University Animal Industry Report 2024

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**Table 1.** Required supplies for performing a fecal egg count (FEC)

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|                            |
|----------------------------|
| Microscope                 |
| McMaster microscope slides |
| Sheather's sugar solution  |
| Plastic pipettes           |
| Gauze pads                 |
| Timer                      |
| Plastic cups               |
| Weighing Scale             |
| Wooden tongue depressor    |

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**Table 2.** How to perform a fecal egg count (FEC) to calculate eggs per gram (EPG)

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1. Collect a fresh fecal sample (preferably less than 12 hours old)
  2. Refrigerate (not freeze) the sample in a plastic bag, minimizing the amount of air in the bag
    - a. Test within 7 days of collection
  3. Obtain the stored fecal sample from the cooled storage area (less than 7 days old)
  4. Put a 2 layers of gauze inside a plastic cup to act as a filter
  5. Measure 4 g of the fecal sample in a paper cup in a weight scale
  6. Measure 26 mL of Sheather's sugar solution
  7. Mix well with a tongue depressor
  8. Strain the solution into the cup with the gauze
  9. Draw 1 mL of the solution with a plastic pipette
  10. Fill the McMaster slide chamber with the solution
    - a. Make sure there is no air bubbles in chamber
    - b. Tip: put the tip of the pipette in the corner of the side and slowly fill the chamber to help prevent air bubble formation
  11. Let the slide sit for 2-5 mins in order to allow eggs to float
  12. Put the slide on the microscope and observe count the eggs per gram on the designated area on each side
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**Table 3.** Recommendations for treatments of different age groups

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| Age group                                  | Timing of treatment                               | Primary pathogen of concern | FERCT         |
|--|---|-----------------------------|---------------|
| Low Shedder Adult                          | 1-2 annual treatments                             | Strongyles                  | Every 3 years |
| Moderate Shedder Adult                     | 2-3 annual treatments                             | Strongyles                  | Every 3 years |
| High Shedder Adult                         | 3-4 annual treatments                             | Strongyles                  | Every 3 years |
| Foals, weanlings, yearlings, two-year olds | 3-4 annual treatments throughout their first year | Strongyles and roundworms   | Every year    |

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**Table 4.** Drugs for the different types of parasites

| Parasite              | Market Names for Drugs   |
|-----------------------|--|
| Strongyles            | >Quest Plus® - Moxidectin/Praziquantel<br>>Zimecterin® - Ivermectin<br>>Equimax® -Ivermectin/Praziquantel<br>>Safe-guard® - Fenbendazole<br>>Panacur® - Fenbendazole<br>>Anthelcide EQ® - Oxibendazole<br>>Exodus® - Pyrantel Pamoate<br>>Strongid® - Pyrantel Pamoate<br><br>*Pyrantel Pamoate, Ivermectin, Moxidectin, Benzimidazoles <sup>A</sup> |
| Ascarids (Roundworms) | >Safe-guard® - Fenbendazole<br>>Panacur® - Fenbendazole<br>>Anthelcide EQ® - Oxibendazole<br>>Exodus® - Pyrantel Pamoate<br>>Strongid® - Pyrantel Pamoate<br>>Zimecterin® - Ivermectin<br><br>*Benzimidazoles, Ivermectin <sup>B</sup> , Moxidectin, Pyrantel Pamoate  |
| Tapeworms             | >Quest Plus® - Moxidectin/Praziquantel<br>>Equimax® - Ivermectin/Praziquantel<br>>Zimecterin Gold® - Ivermectin/Praziquantel<br>>Strongid® - Pyrantel Pamoate<br>>Exodus® - Pyrantel Pamoate<br><br>*Praziquantel (combined with Ivermectin or Moxidectin), Pyrantel Pamoate <sup>C</sup>  |

<sup>A</sup> Benzimidazoles may no longer be effective against Strongyles on some farms due to developing resistance.

<sup>B</sup> Ivermectin may no longer be effective against Ascarids on some farms due to developing resistance.

<sup>C</sup> Pyrantel Pamoate can be used at a double dose to treat Tapeworms in horses.

**Table 5.** Egg reappearance period (ERP) for differentd (i.e., when to perform FEC post-deworming)

| Drug         | Usual ERP   | Collect and Perform FEC |
|--------------|-------------|-------------------------|
| Moxidectin   | 10-12 weeks | 14-16 weeks             |
| Ivermectin   | 6-8 weeks   | 10-12 weeks             |
| Pyrantel     | 4-5 weeks   | 8-9 weeks               |
| Fenbendazole | 4-5 weeks   | 8-9 weeks               |

**Table 6.** Resistance monitoring - How to perform fecal egg count reduction test (FECRT)

1. Obtain samples from the herd (minimum n≥6)
2. Collect fecal sample prior to treatment (this will be the EPG Pre-Treatment value)
3. Administer treatment
4. Collect fecal sample 10-14 days post-treatment (this will be the EPG Post-Treatment value)
5. Calculate FECRT