



# Controlling Common Internal Parasites of the Horse

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Internal parasites can be a significant health threat to horses. Internal parasites are organisms that live a portion of their life cycle in a host animal. They live in internal organs, body cavities, and tissues and gain their nutritive source by feeding on the host animal. The horse is affected by many different species of parasites. The nature and extent of damage varies with the parasite.

While it is obviously expensive to feed parasite burdened horses, depletion of nutrients and blood can cause poor body condition, decrease growth, and reduce reproductive and athletic performance. Other visible signs of parasitism may include a rough hair coat, pot belly (especially young horses), diarrhea, colic, and lethargy.

There are numerous internal parasites that can infect a horse, but only a few that commonly cause significant health problems. It is important to understand the life cycle of these parasites. Successful prevention and control programs are effective because they interrupt the life cycle of parasites. The primary class of internal parasites that cause health problems for horses are: nematodes (such as large and small strongyles), roundworms, and tapeworms. Other internal parasites perhaps of minor significance such as threadworms, lungworms, pinworms, and botfly larvae, are often considered when designing a parasite control program.

## Common Horse Internal Parasites

### Strongyles

Strongyles are grouped as either large or small. The adult form of all strongyles (large or small) will live in the large intestine. Adult strongyles produce eggs that are passed in the feces, thus contaminating the environment. These eggs then develop into infective larvae that exist on the pasture vegetation. Consuming grass, feed, or water contaminated with infective larvae infects the horse. These larvae are very resistant to harsh environmental conditions because of a protective sheath. These parasites can survive freezing weather, but a hot and dry environment will often kill them. The infective larvae survive up to 31 weeks at winter temperatures, compared to up to seven weeks at summer temperatures.

The larvae of large strongyles migrate through various parts of the body. One large strongyle species will burrow into and migrate in the walls of the arteries that are the primary

blood supply to the small and large intestines. This migration can result in disruption of blood flow to the intestines by the formation of blood clots, resulting in colic. After approximately 120 days, the larvae move to the lumen of the large intestine where maturation is completed. As adults, these parasites will lay several thousand eggs each day completing the life cycle. The entire life cycle takes six to seven months.

Other species of large strongyles have similar life cycles except their larval migration is primarily in the liver. This migration results in damage to this organ, but it is not as dangerous as the migration through the intestinal blood supply. These strongyle larvae also return to the large intestines where they mature into adults but their life cycle is approximately eight to eleven months.

The use of effective chemical (dewormers or anthelmintic) compounds has dramatically reduced the prevalence of large strongyles. Today, because of the reduction to near elimination of clinical diseases caused by the large strongyle, the small strongyle is considered to be the number one nematode and most common intestinal parasite of horses. Horses severely infected with small strongyles may exhibit clinical signs such as sudden onset of diarrhea and colic. But horses can be infected with small strongyles and not show overt signs of disease. Small strongyles have been implicated to cause subclinical effects such as decreased feed efficiency, rate of gain, and performance.

The life cycle of the small strongyle (cyathostomes) is very similar to large strongyles, except the larvae do not migrate beyond the wall of the intestines. The larva will burrow in or encyst in the wall of the large bowel for several months before becoming adults (mature worms). As you might expect clinical signs (such as diarrhea, and the negative impact on growth performance) occur when large numbers of the encysted cyathostomes emerge from the gut wall, resulting in significant inflammation and severe injury to the intestinal mucosa. The severity of clinical signs is related to the degree of damage to the intestines which varies with the level of infection. Female adult small strongyles produce a tremendous number of eggs and are typically the primary parasite egg seen in the feces of the horse. There are only a few types of chemical dewormers that can effectively treat the encysted larval stage. Unfortunately, many small strongyle populations have developed resistance to the common chemical dewormers, making control more difficult in certain situations.

## **Ascarid (Roundworm)**

The horse roundworm is a very large (females may be up to 15 inches long), yellowish white nematode (worm) that may pass in the feces of foals and young horses. Typically, adult horses develop immunity to this parasite; therefore, roundworms primarily infect young horses less than two years of age. The life cycle of the roundworm starts when the foal or yearling consumes grass, feed, or water contaminated with the infective eggs. The eggs hatch larvae that burrow into the small intestines migrating through veins to the liver, heart, and eventually the lungs. After migrating in the air spaces of the lungs, the parasite larvae are coughed up and swallowed. The roundworm larvae are returned to the small intestine where they mature to egg producing adults, completing the life cycle. The life cycle takes about three months. Physical damage such as inflammation and scarring of liver and lung tissue occur in the horse during migration. Adult roundworms can cause physical damage, ranging from mild digestive upset and lower feed absorption, to severe colic, due to intestinal blockage or intestinal rupture. Clinical signs of roundworm infection may include unthriftiness, potbelly, rough hair coat, and slow growth. Some young horses develop nasal discharge accompanied by a cough as a result of larvae migration. Many ascarids have developed resistance to the common chemical dewormers which is a significant issue in the control of roundworm infections in young horses.

## **Cestodes (Tapeworms)**

Tapeworms are a member of a class of internal parasites called cestodes. The adult equine tapeworm is a flatworm approximately three inches in length. The life cycle of this parasite requires an intermediate host which is a tiny pasture mite that feeds on horse feces. When the mite consumes tapeworm eggs in an infected horse's feces, the egg will develop for several months inside the mite into the infective cysticercoid stage of the tapeworm. Another horse can then become infected with tapeworms by consuming grass or hay contaminated with mites containing this infective stage. There are typically millions of these pasture (orbatid) mites on a pasture. Adult tapeworms live or attach to a horse's intestines at the ileocecal junction and the ceacum. Heavy infections of tapeworms can cause inflammation, ulceration and thickening of this area of the intestines. The injury to the intestines can be severe enough to cause obstruction or other serious intestinal abnormalities, which may result in acute intestinal pain and may require surgery.

## **Strongyloides (Threadworm)**

Strongyloides is an intestinal parasite that can infect foals as young as four days of age. A foal becomes infected by ingestion of larvae in the dam's milk or by penetration of the foal's skin by infected larvae in the bedding. However, the larvae are not present in colostrum. The larvae migrate through the lungs and the small intestine. The life cycle can be completed in less than two weeks. This creates the potential for severe infestations in a relatively short time. Foals will quickly develop immunity to these parasites and the intestinal infection of adult parasites will disappear by 60 to 90 days of age. The primary medical problem a strongyloides infection may cause is diarrhea that may not respond to treatment. Some foals will become dehydrated and develop other problems related to chronic diarrhea. Treatment of mares with an

anthelmintic effective against strongyloides within 24 hours of birth significantly reduces transmission of this parasite to foals.

## **Stomach Bots**

Stomach bots are not worms, but rather the larvae of the botfly. Female botflies lay their eggs by attaching them to the hairs of the horse. Different species lay their eggs on different parts of the horse's body (legs, jaw, lips, etc.). The eggs on the legs are stimulated to hatch by the lip action and warm saliva as the horse licks its leg. The eggs around the nostrils and lips hatch in one to one and a half weeks spontaneously. Larvae attach and burrow into the tongue and gums of the mouth and incubate there for three weeks. Bot larvae can cause small ulcers on these areas of the mouth. After incubation, they are swallowed and attach to the lining of the stomach. Bots spend approximately nine months attached to the stomach lining before passing in the manure. These larvae pupate into adult flies. The life cycle depends on the parasite larvae overwintering in the stomach, then passing out in the manure in spring and subsequently developing into adult flies.

The adult flies are active from late spring to the killing frost in the late fall and can be very annoying to the horses. Botfly larvae probably cause minimal damage to the stomach, but may cause problems such as obstruction or damage to lining of stomach. However, until these parasites are proven not to cause damage, their control should be considered in any parasite control program. It is recommended to routinely remove bot eggs from the horse's hair coat.

## **Other Species**

Other species of internal parasites that can cause problems for horses include pinworms (which cause tail rubbing) and lungworms. Most of these species do not create a serious health problem because of their lower incidence of infestation or their life cycle is not as harmful to the horse. However on occasion, these parasites can become a problem and your veterinarian can diagnose them and recommend proper treatment.

## **Parasite Prevention and Control**

Many variables affect the selection of a specific parasite prevention and control program. For example, type of environment in which the horse lives (climate), age of the horse, stocking rate, and land type. Internal parasite prevention programs can be divided into two basic areas—management and chemical treatment.

### **Management**

Management programs, which interrupt the life cycle of the parasite before infestation occurs, are the key to successful control. Sanitation in the stall areas is essential. Manure should be removed and placed in a compost pile or spread on cropland. The larvae in composted manure will be destroyed if sufficient heat is built up. Spreading manure by dragging pastures will decrease incidence of infective larvae if the climate allows for drying of manure.

Alternative grazing with ruminants and pasture rotation schemes will aid in disrupting the parasite life cycle. Grazing ruminants in rotation with horses will reduce parasite infesta-

tion since most internal parasites are host specific. Pasture rotation may also help by decreasing incidence of overgrazing, thus decreasing ingestion of parasites.

Vacuuming or collecting fecal material in pasture, is expensive, but it can be very effective. Grouping horses in pastures according to age will help minimize young horses coming in contact with roundworms and heavy larval infestations. For example, pasture mares and foals away from other horses less than two years of age. Yearling horses often need a different control program than a broodmare. It can be more difficult to control parasites in a herd if all ages and classes of horses are in a pasture together. Be sure to isolate and deworm all new arrivals to the farm. When feeding horses, always provide hay mangers and feed bunks. Feeding horses on the ground instead of containers increases the risk of becoming infested with parasites. All feeders, buckets, and water troughs should be routinely cleaned to help prevent fecal contamination of feed or water.

### Chemical Treatment

Various types of chemicals called dewormers or anthelmintics have been developed to eliminate parasites. There are several commercial chemical dewormers currently on the market to remove internal parasites from horses and most are broad spectrum (labeled as effective against most parasites). It is recommended to start with a broad spectrum dewormer then add a parasite specific dewormer if a particular problem is identified such as tapeworms. These chemical dewormers are available in different physical forms, administered as feed additives, oral paste, or stomach tube and are sold under several trade names. These chemical compounds are effective by all routes given, if an appropriate dose is administered based on the horse's weight, and the entire dose gets into the horse.

Some of the common chemical treatment (deworming) programs include daily (or continuous) treatment (along with administering a boticide at least twice a year) and strategic treatments. There is not a deworming program that fits all horses. Factors such as climate, humidity, season, stocking rate, age of the horse, and financial resources of the owner all affect the selection of a parasite control program. To complicate matters, parasites have developed resistance to some of the dewormers, making them ineffective. It is critical to consult a veterinarian to establish an effective parasite control program that will be effective for your horse(s).

An essential component of a parasite control program is a fecal egg count which is microscopically evaluating fecal sample from your horse(s) for parasite eggs. This procedure helps your veterinarian see which parasites are a problem and how heavy the parasite infection is in your horse(s). It is important to have your veterinarian conduct fecal egg counts on a yearly basis to be sure the parasite control program is effective. Ideally, samples will be evaluated before and after deworming so that you can be sure that the chemical treatment is effective and that resistant worms are not present.

## Overview of Parasite Prevention and Control Practices

Internal parasite control is a long-term continuous program. Control of internal parasites in the horse is achieved by combining management practices with chemical (dewormer) treatment. In recent years, parasites that are resistant to dewormers have been increasingly identified in horses. Your veterinarian can recommend the best dewormer for your particular situation and evaluate the horses before and after treatment to be sure the product chosen is effective.

### Suggested Practices:

1. Regular rotation of pastures. Small pastures from one to 10 acres can be divided into smaller areas so horses can be rotated. This will help lower the worm burden as well as give forage a chance to recover.
2. If possible, pasture cattle, sheep, or goats behind the horse(s). These species will consume the infective larvae of the horses' parasites. These larvae will be inactivated.
3. Clean stalls on a regular basis and compost manure.
4. Mowing and harrowing pastures to break up fecal piles during the hottest and driest season of the year will decrease numbers of infective larvae.
5. Feed horses grain and hay from some type of rack or trough. This includes pastured horses.
6. Avoid overstocking pasture(s) as this prevents overgrazing and reduces risk of exposure to infective parasite larva and eggs. Grouping horses in pastures according to age will help minimize young horses' exposure to ascarids (roundworms) and other parasites.
7. Have your veterinarian set up a deworming program to control internal parasites in your horse(s) and perform yearly fecal egg counts to evaluate the effectiveness of the parasite control program.

Always refer to and follow the label instructions of a dewormer when administering it to a horse.

### Summary

Internal parasites are a serious horse health problem. It is essential that proper management techniques be combined with proper administration of chemical dewormers. There is not a single parasite control program that is effective for all horses in all management or environmental situations. Consult a local veterinarian because they are the experts on equine internal parasites in the environment in which you live. As animal health experts, they can design an effective parasite control that fits in a total preventive health plan to maximize horse's health.

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