1974

Parasites of Horses

Cooperative Extension South Dakota State University

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The horse is susceptible to a larger number of gastrointestinal parasites than any other domestic animal. Parasitism is a universal problem often not obvious to the owner, but present in a hidden manner. All horses kept under ordinary management and housing conditions will have a parasite load.

Most people usually associate a "wormy animal" with one that is thin and has a dull-dry haircoat and perhaps is potbellied. These symptoms may describe an animal that has a heavy burden of parasites. However, many normal and healthy looking horses can be infected with internal parasites.

The effect of parasitism may be more evident on undernourished horses than on those that are on a nutritious and adequate ration. The horse and the parasites may be competing for the meager food supply.

As in all worm problems, the best solution is to prevent infection. Adult worms in the intestine of an infected horse produce eggs, which after being discharged and embryonating, are ready to infect other horses. You can halt infection by breaking the cycle at this point—prevent the animal from eating feed or manure carrying the worm larvae. This may seem a simple solution, but it may be difficult to accomplish. As soon as horses use a pasture, it is contaminated and there is little you can do about it. The more closely the pasture is grazed, the greater is the danger of infection.

In the stable, care must be taken to provide facilities so the feed and water supply does not become contaminated with fecal material, which may carry the parasite eggs. Simple management practices, such as providing a rack for hay and a feedbox for grain rather than feeding on the ground, are necessary to prevent contamination of the feed. Watering facilities should be designed to prevent contamination with fecal material and to provide a constant supply of clean water.

For treatment, there are many drugs and chemicals that can be used to "worm" a horse. Research has given us new products that are more effective and safer to use against internal parasites than many of the old-time drugs. No matter how good and effective these new products may be, they in themselves are not the answer to the control of internal parasites. These drugs along with good management practices, can be tailored into a specific program of internal parasite control to meet your particular needs. Many factors need to be taken into consideration when tailoring this program. Your local veterinarian can be of great assistance. The parasites must be first identified before knowing what particular drug will be most effective against them.

INTERNAL PARASITES

There are five classes of internal parasites most commonly affecting horses: 1. Ascarids. 2. Large strongyles. 3. Small strongyles. 4. Pinworms. 5. Bots.

ASCARIDS

Ascarids are the largest internal parasite affecting horses. The adult ascarids may be 8 or 10 inches in length and are white or light yellow in color. They may reach the diameter of a common lead pencil. In spite of their size, they do not attach themselves to the intestinal wall and do not cause as much damage as some of the smaller blood-sucking parasites. However, in foals, their numbers may be so great that they actually block the intestinal tract.

Much of the damage from ascarids is due to the migration of the larvae through the animal's body during their developmental process.

The eggs of the ascarid embryonate on the ground under favorable conditions for 10 to 14 days before they become infective. When picked up from the ground during grazing, they hatch in the intestine and burrow into the intestinal wall. They migrate to the liver through the blood stream. After maturing for a few days in the liver, they are pumped into the blood stream through the heart into the lungs, they penetrate the blood vessel walls of the lungs and enter the air sac and are coughed up the trachea and swallowed again. They then complete their development in the intestine. Severe damage can result to lung tissue due to the penetration of the migrating larvae, especially if bacteria may invade the damaged tissue and cause pneumonia.

The complete cycle takes 10 to 12 weeks.
**Control**

On farms where the infection is common, most foals become infected soon after birth. As a result, most of the worms are maturing when the foals are 2½ and 3 months of age. Treatment should be started when the foals are 8 weeks old and should be repeated at 8-week intervals until they are yearlings. Piperazine is effective against the adult worms and has considerable activity against the immature stages. Several of the organo-phosphate compounds are also effective against horse ascarids.

**LARGE STRONGYLES**

Large strongyles of horses are also known as blood worms, palisade worms or red worms. There are three closely related species that make up this group. Namely: *Strongylus vulgaris*, *S. edentatus*, and *S. equinus*. The adult worms attach to the lining of the caecum and colon. The females produce eggs that are passed in the droppings. Under favorable conditions, the larvae develop to the infective stage within 7 days after the eggs are passed. The larvae are resistant to drying and to low temperatures. Infection occurs when the larvae contaminate food or water. Larvae of the 3 species migrate extensively after entering the intestine before they develop to maturity in the large intestine. Larvae of *S. vulgaris* commonly migrate to the branches of the mesenteric (intestinal) arteries where they may cause damage and irritation and may result in a parasitic aneurism. An aneurism is a bulging of the blood vessel wall, which may hinder the flow of blood or may rupture, causing death by hemorrhage. Blood clots may form in this area of irritation and eventually break away and lodge in the arteries supplying the rear legs of the horse and may cause lameness due to restriction of blood flow to the rear legs.

Larval migration in the arteries and development of *S. vulgaris* to the adult egg-bearing stage within the lumen of the intestine requires about 6 months. Thus foals under 6 months of age harbor *S. vulgaris* in the migratory phase and not in the gut. Worming compounds have no effect at this early age. Successful control can only be achieved in the foal at this age by prevention of infection. The regular use of anti-strongyle drugs in the older horses to reduce the number of eggs passed offers an effective means of reducing the foal’s exposure.

Strongyles are blood suckers and may cause serious anemia. Weakness and diarrhea are also commonly observed. The lining of the intestinal tract may be damaged where the worms attach and suck blood. Severe colic may result from the effect of the aneurism on the flow of blood to the intestines.

**Diagnosis and Treatment**

Diagnosis generally is based on demonstrating the eggs in the feces by microscopic examination. Thiabendazole and some of the newer organo-phosphate compounds are very effective against both large and small strongyles and also effective against the immature forms of these worms. Treatment generally should be repeated at 6 to 8 week intervals for effective control. This is the same interval that is recommended for treatment of ascarids.

**SMALL STRONGYLES**

Most small strongyles are ½-inch or less in length and are very difficult to see. Eggs are passed in the droppings and embryonate on the ground. The larvae, when ingested, form nodules in the wall of the caecum and colon and finish their development there before returning to the lumen of the intestine. Some may produce rather severe ulcers in the wall of the colon. Most of the small strongyles do not appear to be blood suckers.

**Diagnosis and Treatment**

Diagnosis is confirmed by the presence of eggs in the feces by microscopic examination.

Treatment for small strongyles is the same as for large strongyles.

**PINWORMS**

Adult pinworms (*Oxyuris equi*) are found mainly in the caecum, colon and rectum. They spend much of their time in the rectum and come to the anal opening and lay eggs around the outside of the anus. This irritation causes severe itching and restlessness and causes the animal to rub the tail on any stationary object. In severe infections, most of the hair of the tail will be worn away.

The presence of the pinworm may be suspected by the typical behavior of the infected animal. Samples collected around the anal region may contain eggs and the worms may also be found in the droppings.

**Treatment**

Piperazine, piperazine combinations, or thiabendazole, as recommended for strongyles are effective against the adult pinworm.
<table>
<thead>
<tr>
<th>Insect or Parasite</th>
<th>Insecticide or Drug</th>
<th>Formulation and Dosage</th>
<th>Special Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flies (residual barn and wall sprays)</td>
<td>Cygon (dimethoate)</td>
<td>1 gal. of 25% (2 lbs. active/gal.) emulsion concentrate per 25 gals. of water or 3 qts. of 2.67 E.C. to 25 gals. of water</td>
<td>1 gal. per 1,000 square ft. of wall and ceiling surface—wet to run-off</td>
</tr>
<tr>
<td></td>
<td>Diazinon</td>
<td>Wettable powder only 4 lbs. of 50% W.P. to 25 gals. of water</td>
<td>1 gal. per 1,000 square ft. wet to run-off.</td>
</tr>
<tr>
<td></td>
<td>Rabon</td>
<td>1 gal. 24.3% emulsion concentrate to 25 gals. of water.</td>
<td>1 gal. per 1,000 square ft. wet to run-off.</td>
</tr>
<tr>
<td>Horse lice</td>
<td>Malathion</td>
<td>4 lbs. 25% wettable powder to 25 gals. water</td>
<td>Spray animal thoroughly. Repeat in 2 to 3 weeks if necessary.</td>
</tr>
<tr>
<td></td>
<td>Co-Ral (coumaphos)</td>
<td>1 pt. 11.6% emulsifiable concentrate to 25 gals. water</td>
<td>Spray the animal thoroughly. Repeat in 2 or 3 weeks if necessary.</td>
</tr>
<tr>
<td></td>
<td>Piperazine</td>
<td>½ lb. 25% wettable powder to 25 gals. water</td>
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</tr>
<tr>
<td>Spinose ear tick</td>
<td>Korlan (Ronnel)</td>
<td>5% dust from plastic squeeze bottle</td>
<td>Apply inside ears and massage ear gently.</td>
</tr>
<tr>
<td>Horse Bots</td>
<td>Anthon (Trichlorfon)</td>
<td>90%, one 5-gram packet per 250 lbs. body wt, administered in grain ration</td>
<td>Mix with feed consumed at one feeding. Do not treat colts under 4 months or mares in last month of pregnancy. Do not give other drugs or treatments for two weeks after treatment.</td>
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<tr>
<td></td>
<td>Equigard* (Dichlorovos)</td>
<td>3.2 grams per 200 lbs. body weight</td>
<td>Do not use organo-phosphate spray for 10 days following treatment.</td>
</tr>
<tr>
<td></td>
<td>Equigel**</td>
<td>10 mg/Kg 1.49 gm of gel for each 100 lbs. body weight.</td>
<td>Administer orally from syringe included. Follow all label precautions.</td>
</tr>
<tr>
<td>Ascarids</td>
<td>Anthon (Dyrex*)</td>
<td>(See under Bots)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Piperazine</td>
<td>4 gms./100 lbs.</td>
<td>Administration depends upon particular form of product used.</td>
</tr>
<tr>
<td></td>
<td>Equigel**</td>
<td>20 mg/Kg 1.49 gm of gel for each 50 lbs.</td>
<td>Administer orally from syringe included. Follow all label precautions.</td>
</tr>
<tr>
<td>Strongyles (large and small)</td>
<td>Equizole (Thiabendazole)</td>
<td>2 gms./100 lbs.</td>
<td>Not to be used in horses to be slaughtered for human consumption.</td>
</tr>
<tr>
<td></td>
<td>Equigard*</td>
<td>(See under Bots)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dyrex*</td>
<td>(See under Bots)</td>
<td></td>
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<tr>
<td></td>
<td>Anthon</td>
<td>(See under Bots)</td>
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</tr>
<tr>
<td>Pin Worms</td>
<td>Dyrex*</td>
<td>(See under Bots)</td>
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<tr>
<td></td>
<td>Anthon</td>
<td>(See under Bots)</td>
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<tr>
<td></td>
<td>Equizole</td>
<td>(See under Strongyles)</td>
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</tr>
<tr>
<td></td>
<td>Piperazine</td>
<td>(See under Ascarids)</td>
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</tr>
</tbody>
</table>

* For sale only by order or prescription of a licensed veterinarian. **Equigel is effective against Bots and Ascarids, but not against Strongyles.

All pesticide labels are currently being reviewed by Federal agencies. Cancellation of certain pesticides and certain used labels will occur from time to time. In order to keep abreast of these changes, keep in touch with your local county agent or veterinarian.
INSECT ECTOPARASITES

Horse Bots

Horse bots are the larvae of flies that have become highly specialized as parasites of horses. There are three species of horse bots that attack horses in South Dakota; the common horse bot,¹ the throat bot,² and the nose bot.³

Bot flies have four stages, the adult, egg, larva or bot and the pupa. In the western states the flies appear about June and remain active until frost. During this time the adult flies follow their sole purpose—reproduction. The female fly darts in at horses and lays her eggs, gluing them to the hairs of the horse's body, each species according to its choice of laying site. It is at this time that the horses react to the bot flies in a characteristic manner.

Horses will walk about throwing their heads violently; if this fails they begin to run seeking shade or shelter. If the flies are active when the horses are being ridden they become skittish, unmanageable, sometimes running away or throwing the rider.

The eggs of the common bot, are laid on the hairs of the front legs of the animals. The eggs are hatched soon after they are laid but hatching does not take place until they are rubbed by the warm moist lips of the horse. The eggs may remain several weeks but as soon as this stimulus occurs the larvae emerge and attach themselves to the mucous membranes of the mouth. The larva then penetrates the mucous membranes of the mouth, lips, and tongue. They burrow there for a short time and finally migrate to the stomach where they attach to the lining of the stomach by means of strongly developed mouth hooks.

Eggs laid by the throat bot fly are deposited on the hairs of the throat and lips. The friction stimulus is not required to cause the eggs of the throat bot to hatch. The larvae hatch and crawl into the animals mouth lodging between the teeth and in pockets in the mouth. In 20 to 30 days the larvae move into the stomach and attach to the lining of the stomach.

The female of the nose bot fly darts in and lays her eggs on the hairs of the lips and mouth. The eggs hatch in a few days and burrow in the mucous membrane of the lips and gums; here they stay for about 6 weeks. The larvae then migrate to the stomach and attach to the lining of the stomach. The majority of the larvae attach to the lining nearest the pylorus of the stomach or the exit of the stomach into the intestine.

All the species of bots require about 10 to 11 months to develop, eventually passing out of the intestine in the feces.

The larvae of the nose bot will attach themselves in the rectum and anal region before finally dropping to the soil to pupate. At this time the horse will exhibit discomfort by rubbing or switching its tail.

Much of the damage by bots is not recognized, yet the damage caused to the digestive tract is nonetheless important to the health of horses. Treatment is best administered no earlier than one month after the first killing frost. Greatest success is obtained by treating in early winter either in December or January.

Blood Sucking and Nuisance Flies

Certain flies will annoy horses on the pasture or in the barn lot or the arena. They cause pain and discomfort to the horse, at times, making them unmanageable while they are being ridden or shown.

Stable Flies

Stable flies⁴ breed in decaying vegetable matter around the farmstead. Adult flies feed on the blood of mammals. They normally roost on walls, trees, fences in the shade. Once or twice a day they come to an animal, feed vigorously for a minute and then leave to roost on the building and digest its meal. Feeding by stable flies cause animals much discomfort and cause them to switch and kick viciously.

Clean up and sanitation serves to break up breeding areas and contributes a good deal toward fly control. For stable flies one can use a good residual spray on the buildings and fences to kill the flies as they roost.

Horse Flies and Deer Flies

Horse flies and deer flies⁵ are large robust flies that suck blood from horses and other mammals. They breed in standing water that is fairly shallow and with an abundance of organic matter. The bite of the adult is extremely painful and causes horses a great deal of discomfort; however, they are not as numerous in South Dakota as the other flies.

Face Flies and Nuisance Flies

Face flies⁶ do not suck blood but are a severe nuisance to livestock. They sit on the mucous membranes of the eyes and nostrils to feed. This feeding sets up a local irritation and considerable discomfort to horses and domestic livestock. Other nuisance flies

¹ Gastroplzilus intesthwlis
² Gastroplzilus nasalis
³ Gastroplzilus haemorrhoidalis
⁴ Musca stab111ans
⁵ Tabanus sp.
⁶ Musca autumnalis
or blood-sucking flies are a discomfort to horses, either on pasture or while being ridden.

There are a number of prepared repellent mixtures that may be applied to horses to ward off the attack of nuisance flies. These preparations are applied as sprays from a “flit gun,” as “wipe-ons” or from an aerosol “bomb.” Since their effectiveness is short-lived, repeated applications two or three times a day may be necessary.

A single application just before riding is usually enough. One should be careful not to over-apple these materials. This is not from the standpoint of the chemical pesticide, but the oil with which it is formulated. Over-use of oil-based pesticides could cause skin irritation and the animal may develop a dandruff condition. In more advanced cases the skin may become blistered and some hair loss results. While the repellent preparations are effective, one should use no more than is recommended on the label.

Horse Lice

Lice feed on the blood of horses and occasionally horses become anemic and run down. Horses will also rub excessively wearing the hair coat in patches. Young lice hatch from yellow-colored eggs glued to the horse’s hair. They grow to adults in 2 or 3 weeks. Lice can be spread from one horse to another by curry-combs, blankets, and saddles.

Internal parasite and insect control recommendations are subject to change. To simplify the table, trade names of some products have been used. Endorsement by the South Dakota Extension Service is not intended, nor is criticism implied of similar products not being listed.

Mosquitoes

Mosquitoes are a special discomfort to horses on pastures, especially during early spring in wet years. Mosquitoes may be severe enough to warrant keeping horses in the barn during night hours and turning them out only during daylight hours. Aerial spraying the pasture and surrounding area with a ultralow-volume Malathion at 6 ounces per acre will alleviate mosquitoes and nuisance flies for a few weeks per spraying. Horses should not be on the pasture at the time of spraying because of their fear of the applicator plane.