

Controlling Internal Parasites of the Horse

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Introduction

Equine populations in the United States number about 9 million, according to recent surveys. In 2003, five breeds with high numbers (approximate) of horses were Quarter Horse (3 million), Thoroughbred (1.8 million), Appaloosa (653,000), Standardbred (650,000), and Arabian (605,000), according to the American Horse Council. Some estimates indicate that horses have a U.S. economic impact of about \$39 billion.

Keeping horses healthy is a part of the overall investment in horses. Veterinarians are the professionals responsible for the health of the horse population. The control of internal parasites is no small part of the horse health program.

The four most common internal parasites of the horse are strongyles (large and small), ascarids (large roundworms), pinworms, and bots (see Plate 1). Strongyles are considered to be the most damaging.



Plate 1—
Bots, ascarids,
large strongyles,
small strongyles,
and pinworms.

Strongyles

Strongyles are separated into two categories—large strongyles and small strongyles. Large strongyles are much more harmful than small strongyles.

Adult large strongyles are found firmly attached to the walls or free in the contents of the large intestines (see Plate 2). There the females deposit large numbers of eggs that are voided to the outside in the feces. From these eggs, larvae hatch and develop into infective stages which climb blades of grass. Horses swallow these larvae while grazing, and the ingested larvae penetrate into the intestinal walls. The large strongyle larvae then migrate to various organs and arteries, inflicting damage in the organs and arterial walls (see Plate 3). Blood clots form where the artery wall is damaged (see Plate 3) and sometimes these blood clots break away and plug up an artery leading to the intestines and hind legs. This causes colic symptoms and lameness, and sometimes death due to the blocking of an artery. Large strongyles mature about 6 to 11 months after larvae are ingested.

Small strongyle larvae limit their migrations into the intestinal wall (see Plate 4), not in blood vessels or vital organs. Therefore, they do not inflict the severe damage caused by larval large strongyles. Small strongyles develop to maturity about 6 to 10 weeks after horses consume the larval stages.

Strongyles affect horses of all ages, but the young are especially susceptible. Some signs of strongyle infection are fever, loss of appetite, loss of weight, depression, progressive weakness, anemia, recurrent colic, diarrhea, and death.



Plate 2—
Strongyles attached to the wall of the large intestine of a horse.



Plate 3—
Damage to a large artery of the horse by migrating strongyle larvae.

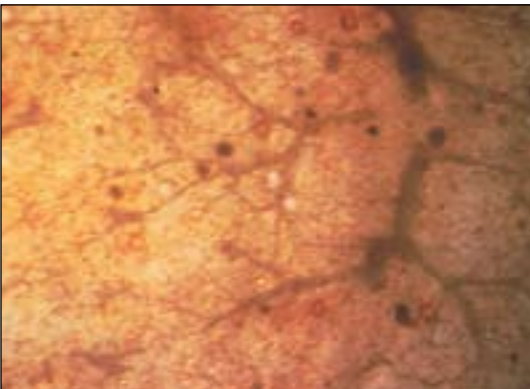


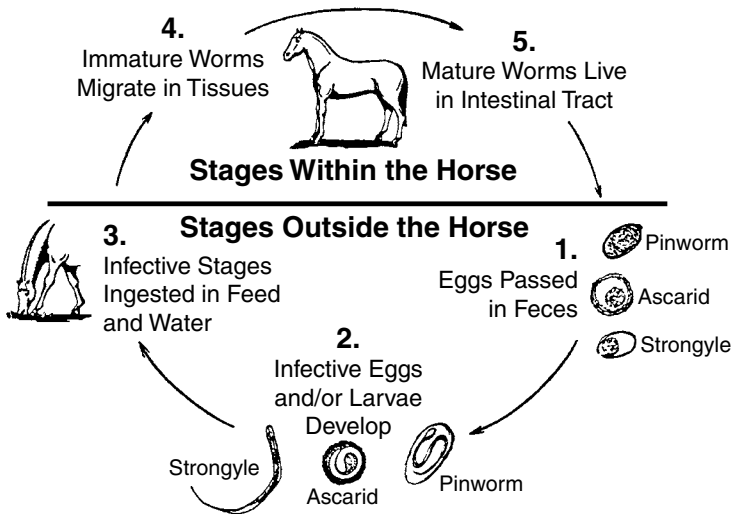
Plate 4—
Wall of cecum containing larvae of small strongyles.

Ascarids

The adult stage of the large roundworm (see Plate 5) is found in the small intestine of the horse. The female worm deposits large numbers of eggs in the intestine, and these worm eggs are voided to the outside in the feces. In about two weeks, these eggs become infective and the horse picks them up and swallows them while grazing. They hatch in the stomach and intestines, migrate into the blood circulation, and are carried to the liver and then to the lungs. The immature worms are coughed up and are swallowed. Upon reaching the small intestine, they mature (see Plate 6) and start laying eggs.

A complete life cycle requires about three months. Any horse that has roundworms can start the cycle. Also, the eggs have a thick shell, and they can remain infective in the environment for several years.

Roundworms are more injurious to young horses than to older ones. They damage the liver and lungs, and cause digestive upsets. Sometimes, they cause rupture of the small intestine and consequent death of the foal (see Plate 6).



Life Cycle of Strongyles, Ascarids and Pinworms



Plate 5—
Heavy ascarid infection.



Plate 6—
Ascarid protruding from
a ruptured intestine of a
horse.

Pinworms

The eggs of pinworms are picked up by horses from contaminated feed, water, bedding, stable walls, fences, or other fixtures. The eggs are swallowed and the worms mature in the colon and rectum. These worms are irritating, causing the horse to rub its tail (see plate 7), with resulting loss of hair and sometimes injury to the tail and rump. The eggs from worms are smeared around the anus and some ruptured worms are voided in the feces.

Pinworms infect all ages, but the young are most susceptible. Adverse effects include digestive disturbances, retarded growth, irritation, and tail rubbing.



Plate 7—
Damage to tail from rubbing caused by pinworm irritation.

Bots

Bots are the immature “maggot” stages in the life cycle of the bot fly. The adult bot fly resembles the honeybee in general appearance. The females lay their eggs by attaching them to the hairs of the horse (see Plate 8), usually in the region of the throat, front legs, and underline. The eggs, containing first stage maggots (or larvae), hatch either spontaneously or after being licked by the horse. These larvae then migrate, or enter the mouth, attach themselves to the lips, tongue, gums, and other mouth tissues, and burrow into these tissues, principally the tongue.

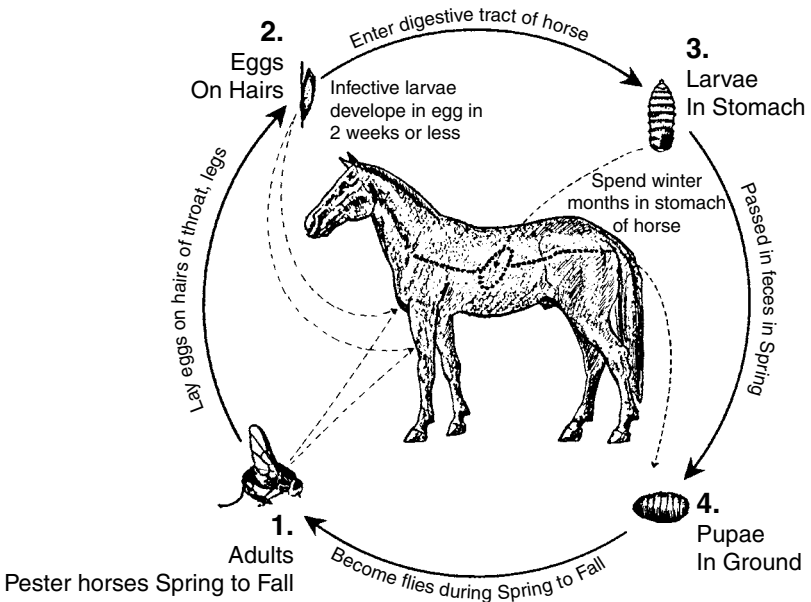
After about three weeks, they emerge from these tissues as second stage larvae, migrate down the throat, and attach themselves to the lining of the stomach (see Plate 9). Here they develop to the third stage and remain for several months firmly attached to the stomach wall. Damage in the stomach includes obstruction of the flow of food from the stomach to the intestine, and irritation of the stomach lining at the site of attachment of the bots. Bots may cause rupture of the stomach and death of the horse. They affect horses of all ages.



Plate 8—
Eggs of the bot fly attached to hairs on the leg of a horse.



Plate 9—
Stomach of a horse opened to show bots attached to the lining.



Bot Life Cycle

Parasite Control

The control of internal parasites of the horse is based on sanitation, management, and drug treatment. Proper disposal of manure is of utmost importance. Stable manure should be composted or spread on cropland or other ungrazed land. Manure in small grazing areas such as paddocks should be picked up at least twice a week and composted or spread on cropland.

In large pastures where manure pickup is not feasible, frequent mowing, chain harrowing, and rotation of pastures along with such practices as separating weanlings and yearlings from older horses, avoidance of overstocking, and following horses with cattle or sheep in pasture rotation will assist materially in cutting down on parasite numbers. Feed should be placed in bunks, mangers, or racks. **Do not feed off the ground. The water supply should be clean and fresh and not contaminated with feces.**

Treatment for worms with drugs should be based on recommendations of a veterinarian. Each farm situation is different. The veterinarian understands the problems of the locale. Surveillance of the parasite problems by periodic fecal examinations should be maintained by the veterinarian. All newcomer and transient horses should be quarantined, checked for parasites, and treated if necessary. Periodic treatments for internal parasites should include all horses on the farm. To aid in keeping down parasite resistance to drugs, a variety of classes of drugs or mixtures should be used alternately.

Suggested Treatment Programs

Foals

Foals should be started on drug treatment at 8 weeks of age to control ascarids. Treatments should be repeated at 8-week intervals to control ascarids and other parasites. Several highly effective compounds are available. Strongyle control in mares should be maintained so that infective stages are less prevalent on pastures ingested by grazing foals. Ivermectin and oxibendazole are effective in controlling strongyloides (the tiny intestinal threadworm) infection, a common concurrent infection in foals.

Sample Program for Foals

Date	Program A Drugs	Program B Drugs
March/April	Panacur 2X (fenbendazole)	Benzelmin (oxfendazole)
May/June	Strongid T/Paste (pyrantel pamoate)	Strongid T/Paste
July/August	Anthelcide-EQ (oxibendazole)	Anthelcide-EQ
September/ October	Strongid T/Paste	Strongid T/Paste
November/ December	Equimax* (ivermectin plus praziquantel), other**	Equimax,* other**

*Equimax – approved for horses a minimum of four (4) months old ; **Zimectrin Gold (ivermectin plus praziquantel) and **Quest Plus (moxidectin plus praziquantel) – approved for horses a minimum of five (5) months old; **Quest (moxidectin) is approved for horses a minimum of six (6) months old.

Yearlings – 2-Year-Olds – Mature Horses

A low-level phenothiazine program formerly was used. It has been replaced by daily feeding of pyrantel tartrate, especially to control larval stages of strongyles, ascarids, and pinworms when ingested by horses. Ivermectin and moxidectin are effective for removing bots; treatment should be given, especially in late fall or early winter.

Periodic treatment programs may be used, varying the number of treatments from twice a year to six times a year, depending on the level of parasitism in the horse. Alternating the various classes of drugs and/or using combinations of drugs provides broad-spectrum control of strongyles, ascarids, pinworms, and bots. Number of treatments or whether to treat can be based on determining worm eggs per gram of feces (EPGs). Depending on parasite control history, horses with low or negative EPGs probably do not need treatment.

Sample Program for Older Horses

Number of Treatments Per Year			
Month	Drugs (use only one of the drugs listed per treatment)		
	6 times	4 times	2 times
February	Eqvalan (ivermectin), Equimax,* Quest (moxidectin),** other***	-----	-----
April	Panacur, Anthelcide-EQ, Benzelmin	Eqvalan, Equimax,* Quest,** other***	Eqvalan, Equimax,* Quest,** other***
June	Strongid T/Paste	Panacur, Anthelcide- EQ, Benzelmin	-----
August	Eqvalan, Quest**	Strongid T/Paste	-----
October	Same as for April	-----	-----
December	Same as for February	Same as for April	Same as for April

*Equimax – approved for horses four (4) weeks and older, including breeding mares and stallions;
 Quest (moxidectin) – approved for horses six (6) months and older, including breeding mares and stallions; *Zimectrin Gold (ivermectin plus praziquantel) and ***Quest Plus (moxidectin plus praziquantel) – approved for horses five (5) months and older but NOT for breeding mares and stallions.

NOTE: Do not treat mares with in one month of foaling.

Antiparasitic Compounds^a for Major Internal Parasites
(Commercially Available as of September, 2005)

Class	Generic Name^b	Trade Name^b	Source	Form	Large Strongyles	Small Strongyles^c	Ascarids^c	Pinworms	Bots	Tapeworms	
Avermectins	Ivermectin	Eqvalan	Merial	L,P	X	X	X	X	X	O	
	Ivermectin plus	Zimectrin Gold	Merial	P	X	X	X	X	X	X	
	Praziquantel										
Ivermectin plus	Equimax		Pfizer	P	X	X	X	X	X	X	
	Praziquantel										
Moxidectin	Quest		Ft. Dodge	P	X	X	X	X	X	O	
Moxidectin plus	Quest Plus		Ft. Dodge	P	X	X	X	X	X	X	
	Praziquantel										
Benzimidazoles	Fenbendazole	Panacur	Hoechst	L,F,P	X	X	X	X	O	O	
	Oxfendazole	Benzelmin	Ft. Dodge	P	X	X	X	X	O	O	
	Oxibendazole	Anthelcide-EQ	Pfizer	P	X	X	X	X	O	O	
Piperazines	Piperazine	Various	Various	L	O	X	X	X	O	O	
Pyrimidines	Pyrantel	Strongid T	Pfizer	L,F	X	X	X	X	O	O ^d	

Strongid Paste	Pfizer	P	X	X	X	X	O	O ^d
Strongid C	Pfizer	F (LL)	X	X	X	X	O	O ^d

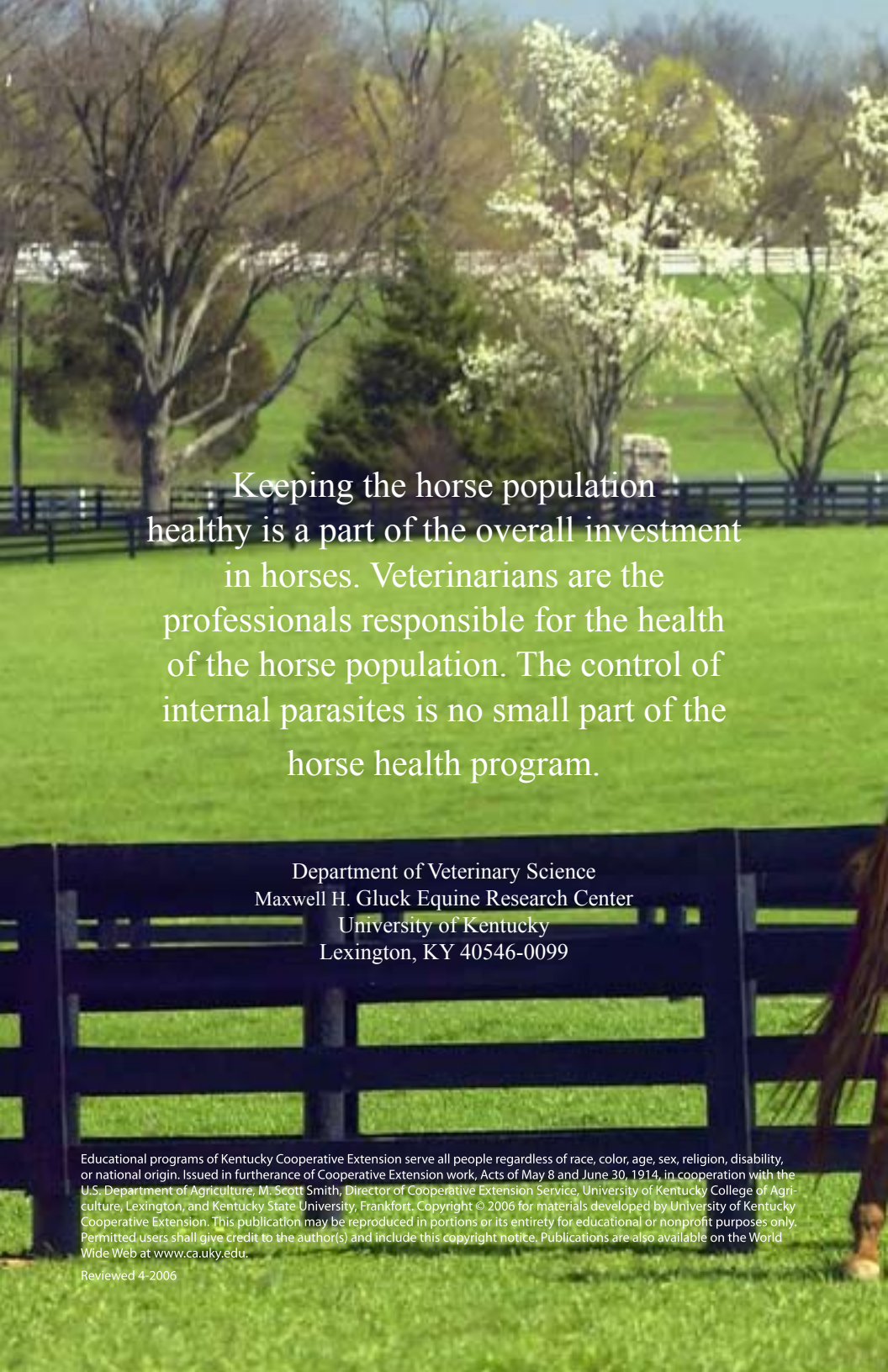
^{a)}Label recommendations should always be read and followed; ^{b)}Note: There are numerous products with different trade names but generic names do not change – therefore, one should look for the generic names on labels and in the literature so that there is no duplication in purchasing and using the products; ^{c)}Drug-resistance may be encountered; ^{d)}No label claim but reports of activity; X = effective - some compounds more than others; O = ineffective; Form = formulation; L = liquid; P = paste; F = feed; LL = low-level.

Note: **Zimectrin Gold** (ivermectin plus praziquantel) **is approved** for horses five (5) months and older **except for breeding** mares and stallions.

Equimax (ivermectin plus praziquantel) **is approved** for horses four (4) weeks and older, **including** breeding mares and stallions.

Quest (moxidectin) **is approved** for horses six (6) months and older **including** breeding mares and stallions.

Quest Plus (moxidectin plus praziquantel) **is approved** for horses five (5) months and older **except for** breeding mares and stallions.

A scenic view of a horse farm. In the foreground, there is a dark wooden fence. Behind it is a lush green field. In the background, there are several trees, some with white blossoms, and a white fence line. The sky is clear and blue.

Keeping the horse population healthy is a part of the overall investment in horses. Veterinarians are the professionals responsible for the health of the horse population. The control of internal parasites is no small part of the horse health program.

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Reviewed 4-2006