More than 150 types of internal parasites are known to infect horses. From a practical standpoint, the most important ones are strongyles, ascarids, tapeworms and bots. The digestive tract, or stomach and intestines, is the most commonly affected area, although larvae migrate through all tissues of the horse’s body.

Life cycles of strongyles and ascarids are similar in that they are classified into a large group of parasites known as roundworms (see Figure 1). Bots are the larvae of an insect, the bot fly.

Every horse is infected by one or more of these parasites. For this reason, horses should be on a parasite prevention and control program. A general knowledge and understanding of the nature of these parasites and their development is essential before necessary prevention and control measures can be effectively applied.

Internal parasites are widespread. Unless control measures are practiced, parasites are likely to increase and cause severe injury or death of the horse. Injury or harm inflicted on the horse is related to (1) the kind of parasites, (2) the number involved, and (3) the time over which the parasites are acquired.

Strongyles are the most injurious, whereas ascarids, bots and tapeworms are generally less harmful. A few parasites may be tolerated by the horse without apparent signs of ill effect, but larger numbers are likely to be harmful. Acquiring a large number within a few days may overwhelm and kill a horse; however, getting the same number over a period of weeks or months is generally much less harmful.

Horses affected the most by parasites are young sucklings or weanlings and yearlings. In general, ascarid problems are restricted to young horses. This is because in most cases, resistance or immunity is built up by the time a horse is 2 or 3 years old. On the other hand, strongyles and bots affect horses of all ages. Even so, the young are much more severely affected than older horses. Table 1 gives a brief outline of the location, ages affected, injury and symptoms.

Life cycles

Each species of parasite has a specific life cycle. Since all of the parasites pass out in the droppings, controlling the manure is a very important step toward ridding the horse of parasites.

**Strongyles.** Strongyle eggs (Stage 1) leave the horse in the feces and contaminate the ground, paddock or pasture. Under optimum conditions, strongyle eggs hatch and develop into infective larvae in one week (Stage 2).

These larvae are encased in a thin skin or sheath, which protects them to some extent from the environment. They may live for several months. They are quite active and crawl up on grass or other pasture forage. Thus they become available to the horse and are consumed (Stage 3) in the grazing process. Some may gain access to water and become ingested as the horse drinks.

After strongyle larvae are swallowed, further development occurs, but there are marked differences between large and small strongyles during this stage (Stage 4). Larvae of the large strongyle (*Strongylus vulgaris*) migrate extensively within the walls of arteries that supply blood to the gastrointestinal tract. Hence they are commonly referred to as “bloodworms.”
Damage to the arterial walls by this parasite causes an
aneurysm, an enlargement of the blood vessel.

Blood clots also form as a result of the blood-
worms migrating in the arteries. These clots shut of f
the blood supply to the intestine and r esult in colic. Complete blockage of the arteries may occur, and
when this happens the animal dies. Thus S. vulgaris
is the most harmful and danger ous of all the internal
parasites.

Development of the large strongyle larvae
requires a seemingly pr olonged period of time —
about six months — before they become sexually
mature worms. These adult worms (Stage 5) attach to
the inner surface of the large intestine and are active
bloodsuckers. The females lay eggs, which leave the
body in the feces to complete the cycle.

Small strongyle larvae (Stage 4) penetrate the
wall of the intestine. Their development causes nod-
ule formations in the walls. This injury is much less
serious than that caused by large strongyle larvae, but
is still significant in interfering with digestion.
Development of small strongyle larvae is also r ela-
tively rapid in comparison with that of the large
strongyles, requiring about six weeks. Mature small
strongyles (Stage 5) also live in the large intestine, but
for the most part they are not attached to the lining
and do not suck blood. The mature females lay eggs,
which are also discharged in the feces like those of the
large strongyles.

Ascarids. The ascarid cycle is also initiated by the
passage of eggs in the feces (Stage 1). Under favorable
conditions, ascarid eggs develop to the infective stage
(Stage 2) in two weeks. Ascarid larvae remain in their
thick, tough egg shells, which are resistant to environ-
mental conditions — pastures, paddocks and stables
may remain infected for years.

Infection of the horse (Stage 3) occurs in the act of
grazing or drinking materials contaminated with
infective ascarid eggs. Inside the stomach, the eggs
hatch and the larvae penetrate the walls. They
migrate (Stage 4) in the bloodstream to the liver and
to the lungs. After a short period of development in
the lungs, they are coughed up and swallowed. This
brings them back to the small intestine, where they
develop into mature worms (Stage 5) and start egg
production in about 10 weeks to complete the cycle.

Ascarids don’t suck blood, but they are the
largest of the parasites of the horse, attaining lengths
of 10 to 12 inches. Masses of ascarids may rupture the
small intestine and result in peritonitis, usually a fatal
consequence.

Tapeworms. Tapeworm eggs leave the horse in
feces and contaminate the pasture. Tapeworm eggs
are eaten by free-living (nonparasitic) mites (oribatid
mites) which are particularly prevalent on permanent
pastures. The tapeworm undergoes an essential matu-
ration stage inside the mite. Horses inadvertently
ingest the oribatid mite when grazing.

Following digestion in the horse’s intestinal tract,
the tapeworm is able to infect the horse. It matur es
into an irritating adult at the junction of the small
intestine with the large intestine. Heavy tapeworm
infestation may cause colic, weight loss or ill-thrift.

Tapeworm problems may be incr easing in fre-
cuency in recent years. Ivermectin (which is
extremely effective at killing all other parasite groups)
is not effective against tapeworms, and the
widespread use of ivermectin may have promoted the
number of tapeworms that are able to colonize the
intestine. Nevertheless, problems due to tapeworms
are still relatively uncommon.

Bots. The bot cycle of development is similar in
many respects to that of the worm parasites (see
Figure 2). The adult bot flies attack the horse and
deposit eggs (Stage 1) on the hairs, principally on the
legs, chest, neck, throat and around the mouth. Development of infective larvae in the eggs (Stage 2)
takes one week. These eggs hatch and the larvae gain
access to the horse’s mouth (Stage 3) either by active
migration or when the horse bites or chews at its legs,
etc. Inside the mouth, the larvae invade the tongue or gums.

After a development period of three weeks, the larvae emerge, are swallowed, and attach themselves to the lining of the stomach. These larvae in the stomach are commonly referred to as “bots.” They remain attached to the stomach for several months. In essence, this period spent in the stomach is a mechanism for overwintering.

In the spring and summer, the bots detach themselves from the stomach wall and are passed to the outside in the feces. The discharged bots burrow into the ground and pupate. After about three weeks, the adult flies emerge from the pupae to complete the cycle. In temperate regions, there is only one cycle completed each year.

**Prevention and control**

Sanitation and management practices should be used to assist in controlling internal parasite infections. Remember that foals are born free of internal parasites. The buildup of their internal parasite infections is related to the degree of contact, either direct or indirect, with older animals carrying the infections. All of the worm parasites discussed here use feces or manure as the means of spreading the infections by contamination of feed and water supplies or the environment.

Transfer stages of these worm parasites do not actively seek the host to complete the infection process. Instead, they rely on chance to be picked up and swallowed. Thus only a small percentage actually complete this hazardous step in the life cycle. To compensate for this, large numbers of eggs are produced by the female worms to start the transfer process.

Sanitation and management practices aid in controlling or minimizing the spread of the infections. These practices assist the natural destructive forces such as sunlight and drying during transfer stages. Susceptible animals also should have limited contact with contaminated pastures, paddocks or stables. A checklist of sanitation and management practices that have been found effective in reducing numbers of parasites includes the following:

1. Proper manure disposal.
   a. Stable manure — compost before spreading on pasture, or spread on cropland and other ungrazed areas.
   b. Small corrals or paddocks — pick up all manure and compost or dispose of it as above.
2. Pasture management.
   a. Practice frequent mowing and chain harrowing.
   b. Avoid overstocking.
   c. Rotate grazing as much as practicable.
3. Feed.
   a. Provide mangers, racks or bunks for hay and grain.
   b. Do not feed off the ground.
   a. Provide clean water supply.
   b. Avoid sources contaminated with feces.
5. Remove bot eggs – clip egg-bearing hairs or sponge affected areas with warm water.
6. Practice regular deworming of horses under the supervision of a local veterinarian who is familiar with local geographic and meteorological variances.

In addition to the foregoing practices, it is generally necessary to treat the animals with specific drugs, commonly referred to as anthelmintics, to obtain effective control. These drugs remove the parasites from the intestinal tract. Thus the treated animal is relieved of the immediate damage or injury caused by parasites, but probably more important, removal of parasites breaks the cycle. This serves to reduce contamination of the environment with transfer stages, thereby limiting the spread of the infections and protecting animals from reinfection.

The best method of strongyle control currently recommended is to administer a small quantity of a deworming compound (pyrantel pamoate) to the individual horse’s ration daily. This compound is marketed as Strongid-C® and is very effective in those management systems in which horses are fed...
The best routine deworming program that could be used for any particular management system should be designed around individual client/horse requirements and may differ depending on the number of horses on a pasture, amount of time spent at pasture compared with time spent in a stable, availability of alternative pastures (for rotational grazing), age, etc. The local veterinarian is best placed to guide the horse owner regarding the optimal deworming strategy.

If daily deworming cannot be undertaken, regular use of ivermectin is recommended (every six to 10 weeks depending on the local circumstances). Ivermectin has had a profound effect on parasite burdens in horses. It is so effective that the old-fashioned deworming strategies that used stomach-tubing or promoted the “rotation” of a number of weaker deworming compounds have become effete and are no longer recommended.

Traditionally, it has been necessary to use dangerous and toxic compounds to eliminate bots. Fortunately, ivermectin is as effective against bots as it is against strongyles and ascarids. Although tape-worm problems are uncommon, once-yearly deworming against tapeworms is recommended for horses that are dewormed with ivermectin on a regular basis (especially if the horse has access to permanent pasture grazing). The best method of deworming against tapeworms is to use a high dose of pyrantel pamoate.

The veterinarian’s services can include a microscopic examination of fecal samples for an indication of the kinds and relative numbers of worm parasites in the animals. This, along with other information such as numbers and ages of animals, type and amount of pasture, provide the veterinarian with a rational basis for the selection of drugs and frequency of treatments for the particular situation.

With primary emphasis on strongyle control, some operations may require only one or two treatments per year, whereas others with factors or circumstances favoring heavy infections may take as many as six treatments per year to maintain effective control. All horses on a farm should be included in the control program. New stock or transient boarders should be treated and quarantined for a week or so before they are placed on pasture or otherwise allowed to mingle with resident horses.

Parasite infections are inherently insidious and tenacious. Success in controlling them must be a determined and sustained effort. A continuing battle must be waged against internal parasites, the most common danger to the health and well-being of horses.

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