



## WORMING YOUR HORSE

*Over the last decade, resistance to worming products has begun more common, particularly in small red worm (cyathostomin) populations. This means that the way we think about worming horses now needs to get smarter.*

### *Which Worms Infect My Horse?*

#### 1. Small Strongyles (Cyathostomin species)

Small strongyles (‘**small red worm**’) are the **most common and harmful** intestinal worm of horses worldwide and account for 95% of faecal worm egg count burdens. The adult worms are small (1-2 cm long) and live in the horse’s large intestine (Fig. 1). The adult worms lay eggs which pass onto the pasture in the manure. Larvae (immature worm) hatch from the egg and cleverly migrate up blades of grass to ensure they get eaten by a horse. Once eaten, the larvae pass down through the digestive tract until they reach the large intestine. Once there, the larvae burrow into the wall of the gut (Fig. 2).

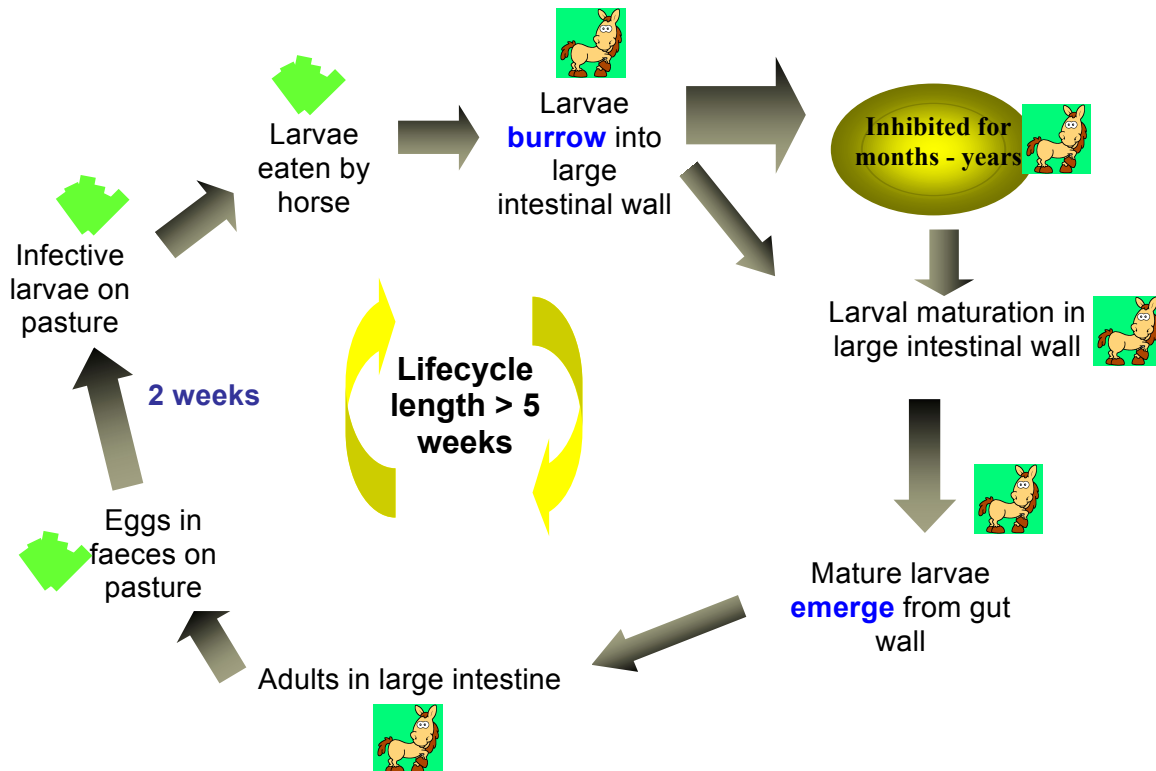


**Fig. 1:** *Small red worms (cyathostomins) on the large intestinal wall.*



**Fig. 2:** *Small red larvae encysted in the lining of the large intestinal wall.*

Once encysted in the gut wall, the larvae can continue to develop and mature into the next larval stage, or they can go into hibernation for a variable length of time (weeks to years) before continuing development. This hibernation stage is called ‘hypobiosis’ and is important as these larvae are not killed by most available worming drugs. When mature, larvae emerge from the large intestinal wall back into the digestive tract, become adults and start laying eggs. The entire lifecycle takes approximately 6-12 weeks (or much longer if larvae hibernate in the gut wall) (Fig. 3).



Key



Denotes a stage of the lifecycle that can be controlled by pasture management



Denotes a stage of the lifecycle that can be controlled by worming the horse

**Fig. 3:** Schematic diagram of the full cyathostomin lifecycle which takes at least 5 weeks.

Small strongyles can cause weight loss, chronic colic, diarrhoea and even severe, life-threatening inflammation of the large intestine if large numbers of larvae emerge from the gut wall at the same time (Fig. 4). In these cases of colitis, up to 50% of horses can die despite aggressive treatment. Young and old horses appear to be more susceptible to colitis caused by mass emergence of cyathostomin larvae.

Unfortunately, larvae in the gut wall (and especially hypobiotic larvae) are more difficult for worming drugs to reach and not all products are able to kill these immature stages. All horses allowed to graze grass will have larvae in their large intestinal wall. In fact, up to 90% of the worm burden carried by the horse will be these immature larval stages. Only adult worms in the digestive tract can produce eggs and so there is no way of determining how many immature worms (larvae) are hidden in the large intestinal wall; therefore it is very important to use a wormer active against these stages once a year, even if faecal egg counts have been low (or zero) all year. The winter is the best time to use a larvicidal (i.e. kills larval stages in the gut wall) worming product as eggs and larvae on the pasture cannot continue to develop to the infective stage in cold temperatures, limiting further contamination of the horse. Only Panacur Guard (5 days fenbendazole) and Equest (moxidectin) are licensed for use against hypobiotic larvae and are considered ‘larvicidal’.



**Fig. 4:** Pony with severe diarrhoea caused by mass emergence of cyathostomin larvae.

## 2. Large Strongyles

Migration of the large strongyles (*Strongylus vulgaris*, *Strongylus edentatus* and *Strongylus equines*) used to be a common cause of colic; however, following the discovery and widespread use of the ivermectin based wormers, these worms have all but disappeared. The adult worms again live in the large intestine and the larval forms migrate through the horse's other internal organs.

## 3. Pin Worm (*Oxyuris equi*)

Infection with these worms is less common. The adults live in the caecum, colon and rectum and may actually be seen hanging out, or moving in and out, of the horse's anus. The female worm lays her eggs around the anus of the horse, which can cause intense itching of the bottom and self inflicted trauma from the horse rubbing against solid objects (Fig. 5). In recent years the pin worm has become resistant to several worming drugs including fenbendazole and ivermectin.



**Fig. 5:** Pony with pin worm (*Oxyuris equi*) infection causing severe itching of the anus and surrounding area with subsequent self inflicted trauma.

## 4. Round Worm (*Parascaris equorum*)

*Parascaris* worms are large white 'spaghetti' worms that live in the small intestine of foals and yearlings. Horses become naturally immune to this worm by about 2 years old and therefore infection in adults is rare.

Adult round worms live in the small intestine and produce eggs which are passed in faeces onto the pasture. These eggs are produced in huge numbers and are very resistant to the environment. Eggs hatch to produce larvae which are eaten by grazing young stock. These larvae then migrate from the intestines into the liver and then the lungs before returning to the small intestine where they become adults. An entire lifecycle takes approximately 10 weeks.

Large round worm burdens cause unthriftiness and a pot-bellied appearance. As larvae migrate through the lungs they can also cause coughing and nasal discharge. If very large numbers of adult worms are present in the gut, the small intestine can become blocked resulting in severe colic and even rupture of the gut if not caught quickly (Fig. 6).



**Fig. 6:** Colic surgery on a yearling with a large round worm burden that has resulted in blockage of the small intestine. Large numbers of round worms are being removed from the gut.

#### 5. Tape Worm (*Anoplocephala species*)

The most common tape worm in the UK is called *Anoplocephala perfoliata*. Infection is relatively common with younger and older animals more commonly infected. The tape worm has a complicated life cycle which involves an intermediate stage in the forage mite. Adult worms live at the junction of the small and large intestine where they can cause thickening and ulceration of the gut wall (Fig. 7). Infection can also disrupt gut motility and both spasmodic colic and small intestinal impaction have been shown to be associated with tape worm infection.

Diagnosis of tape worm infection can be challenging as eggs are shed inconsistently in the faeces; however, a blood test to identify tape worm proteins is now available which is more reliable. Many people simply prefer to treat once or twice a year for tapeworms rather than test for their presence.

There are two products available for treatment of tapeworms: a single dose of praziquantel (e.g. Equitape) or a **double** dose of pyrantel (Strongid P). Combination worming products are also available e.g. praziquantel combined with ivermectin in Equimax and with moxidectin in Equest Pramox.



**Fig. 7:** Junction of the small and large intestine of a horse showing large numbers of adult tape worms.

#### 6. *Strongyloides Westeri*

This worm only affects foals as immunity develops by approximately 6 months of age. Foals can be infected by ingesting larvae from the pasture or milk from the dam and by larvae on the grass penetrating the foal's skin. Adult worms live in the small intestine and heavy burdens can cause diarrhoea, weight loss, dullness and reduced growth rate.

Foals can be treated for *Strongyloides westeri* using any wormer, except moxidectin which is not licensed in young stock (less than four months).

## 7. Bots (*Gastrophilus species*)

'Bots' are the larvae of a fly which is active in the summer months. The fly lays eggs on the legs of the horse which are then eaten whilst the horse grooms its legs. The larvae develop in the stomach and bots are passed in faeces during summer months. It is questionable whether bots actually cause disease. Ivermectin and moxidectin products kill bots and, if used for bots, are best given in the winter when there are no further flies to lay eggs.

### ***What is the Best Worming Protocol?***

Over the last decade resistance has been reported, particularly in cyathostomin populations, despite use of an increasing number of wormer drugs. This is worrying as there are no new drugs in the pipeline if worms become resistant to all the currently available drugs. There are several different ways which horses can be de-wormed, each with pros and cons.

#### Interval Dosing

'Interval dosing', which many horse owners / yard managers use, and is promoted by drug companies, involves regular wormer administration based on the egg reappearance periods after treatment with wormer: e.g. dosing with moxidectin (Equest) every 13 weeks as this is how long it takes for eggs to reappear in the manure after treating with moxidectin. It is important to realise if using this method that the egg reappearance time differs for each wormer drug: moxidectin 13 weeks, ivermectin 8 weeks, pyrantel 6-8 weeks and fenbendazole 4-6 weeks.

This is an 'easy' protocol to follow; however, this regimen will result in the routine worming of many horses that do not need it as studies have shown that in any given population, 80% of worms are carried by only 20% of horses. Not only is this a waste of money and giving your horse unnecessary drugs, more importantly this 'over-worming' is believed to have made a substantial contribution to drug resistance.

#### Strategic Dosing

This protocol involves worming horses at key times when parasite burdens are thought to be highest e.g. larvicidal treatment of encysted cyathostomins in winter. Although this provides a more rational approach, problems can arise when abnormal patterns of weather lead to early or late peak pasture counts or when heavily infected animals are added to the population.

#### Targeted Strategic Treatment

This protocol adapts the strategic dosing programme to administer wormers at the most appropriate times of the year, based on the life cycle and environmental factors involved (e.g. pasture management), and **also takes into account the levels of infection in individual horses by monitoring individual faecal worm egg counts (FEC)**. This means that *each property has its own individual treatment plan* according to the horses and factors relevant on that particular property.

Regular FEC are used to identify the horses most susceptible to worms and that are contaminating the pasture. These horses are de-wormed whilst the other horses are left untreated to reduce the use of worming drugs (and therefore the likelihood of resistance) on the property. This type of programme is typically associated with a substantial (>50%) reduction in the total amount of wormers used on a yard.

If using this programme it is important to remember that FEC detect only adult worms and therefore a larvicidal product should be used in all grazing horses, once per year, regardless of FEC results.

Likewise, horses should be treated once per year for tapeworms (remember these can be combined using a combination wormer if desired).

### Management Practices

An essential part of all worm control programmes is to ensure that drug treatments are combined with good management to minimise infection levels and consequently reduce reliance on drugs:

1. Do not overstock
2. Remove faeces regularly from pasture (twice weekly)
3. Give wormer doses based on the weight of each animal
4. Quarantine newcomers for 48 hours and treat with moxidectin (preferably combined with praziquantel for tapeworms)
5. Co-grazing with sheep or cattle reduces pasture contamination
6. Harrowing in the *summer* (not winter!) can also be used to limit pasture contamination

**If you have any queries regarding worming your horse or wish to set up a targeted strategic worming programme, call us at the Dick Vet Equine Practice on 0131 445 4468**