



## EQUINE REDWORM

*Cyathostomin/Strongyle sp.*

### REDWORM IN HORSES

There are two types of redworm found in the horse – small and large strongyles.

**Small redworm** or *Cyathostomins* are the most common and arguably most dangerous parasite threat to horse health. They have a very quick lifecycle (as little as five - six weeks) and reproduce in large numbers; 95% of parasite burdens found in horses are small redworm. As well as large populations of adult redworm being problematic to the horse, cyathostomes also have an unusual developmental stage, where the larvae of some species burrow into the horse's gut wall and encyst with the potential of causing serious consequences when they re-emerge. The small redworm is up to 2.5cm long, thin and usually reddish in colour (the unfed worms appear white).

**Large redworm** or *Strongylus vulgaris*, while they have the capability to cause more damage in the horse, have been vastly reduced over the last 40 years due to modern worming regimes. Large redworm also have a migratory larval stage that can cause blockages in blood vessels, damaging vital organs and triggering life threatening haemorrhages and internal bleeding. The large redworm is a darker red and bigger than the small redworm at up to 5cm long.

### Symptoms

Symptoms of both large and small redworm infections include loss of condition, weight loss and anaemia, distended stomach, staring or dull coat as well as diarrhoea and colic. Long term, small redworm infestation can seriously damage the intestinal wall, reducing the horse's ability to absorb nutrients. The horse may become a chronic 'bad doer', and in some cases, a severe infestation can be fatal.

Conversely it is also possible for a horse to appear perfectly healthy while carrying a significant worm burden.

### Encysted small redworm

The majority of small redworm species go through a unique lifecycle stage that is particularly dangerous to the horse's health.

regular  
worm  
counts help  
to identify  
high egg  
shedders

L3 larval stages of the worm burrow into the gut wall of the large intestine and become encysted. Some continue to develop within the gut wall, re-emerging soon after to become adult, egg laying worms residing in the large intestine.

Other larvae stay encapsulated for months or years within the horse's gut wall, lying in a dormant state known as inhibited encysted larvae. Tens of thousands of these encysted larvae can line the intestine, where they impair absorption of nutrients, resulting in possible weight loss and life-threatening illness.

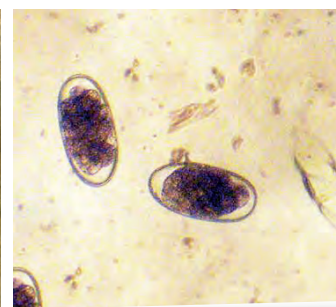
Here they wait until conditions, such as a change in season from winter to spring, triggers a 'mass emergence' from the gut wall. This activity can cause cause life-threatening bowel inflammation, known as colitis (larval cyathostominosis) in the horse.

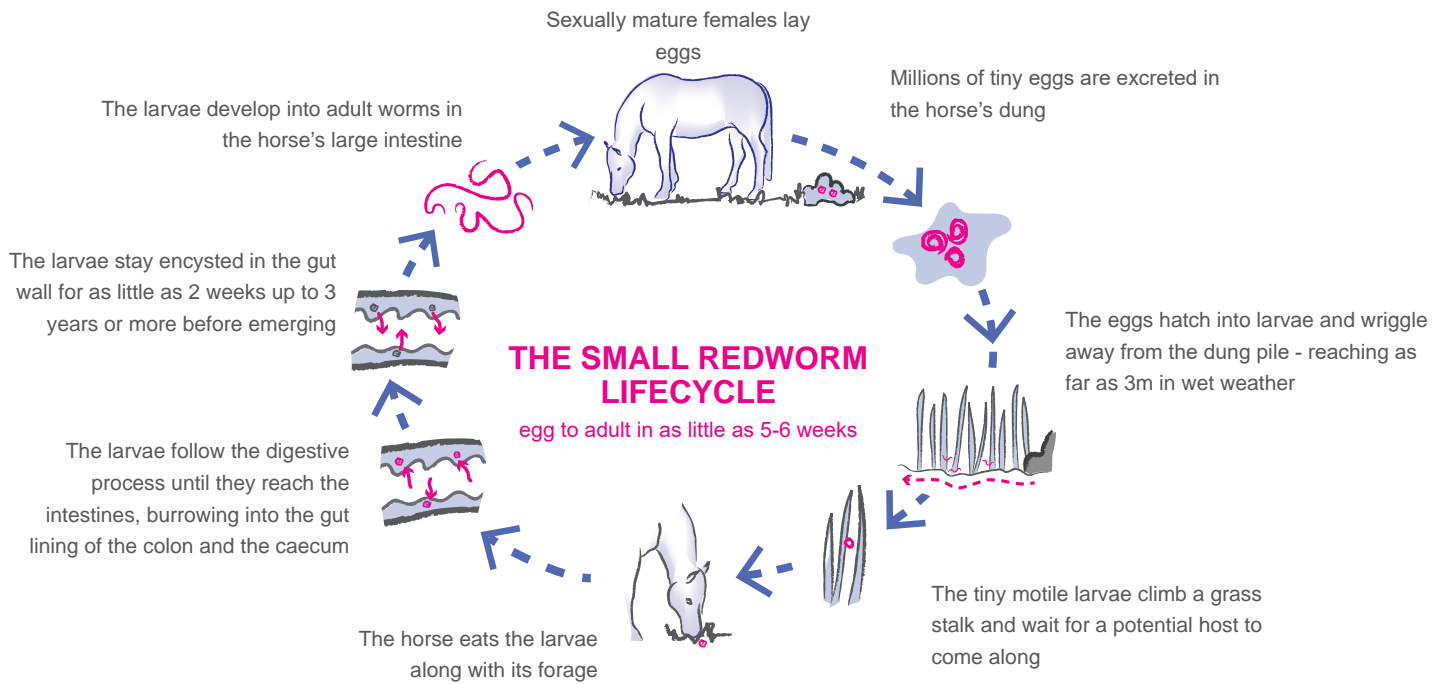
### Testing with worm counts

Worm egg counts are a reliable tool to detect adult egg laying stages of small and large redworm as well as roundworm. They should be used regularly, every three months throughout the year, to test for infection levels and target treatment if required if the worm count rises above 200 eggs per gram.

A worm egg count won't distinguish between large and small redworm eggs but as the treatment is the same for both parasites this is not problematic. Horses are not meant to be completely worm free and using the drugs in this way helps to reduce resistance as well as being better for the horse and the environment.

Below left: An encysted redworm larvae  
Below right: Redworm eggs seen under the microscope





A worm egg count will not show encysted stages of small redworm as the larvae do not lay eggs. Scientists are currently working on developing an antibody test to detect any levels of infection by measuring the immune response of the horse. Until a test is available that allows evidence based treatment then a suitable wormer should be given once a year in the winter months to guard against the possibility of encysted redworm.

Regular worm egg counts help us to monitor horse's worm burdens and build up a general picture of their health. Within a single herd it is very common to see 80% of the worms in 20% of the horses. This is because some animals are more disposed to carrying parasites - this could be because they are young or old, they have a compromised immune system, or simply that they have favourable gut conditions or grazing habits for the parasites. These animals are known as 'high egg shedders' and it is useful to identify them in your herds so that they can be managed accordingly.

## Treatment

A number of wormers are licenced to treat **adult stages** of redworm including fenbendazole, pyrantel, ivermectin and moxidectin.

## A TARGETED WORMING PROGRAMME

A veterinary approved programme for healthy adult horses

SPRING	Worm egg count for redworm and ascarids	Saliva test for tapeworm
SUMMER	Worm egg count for redworm and ascarids	
AUTUMN	Worm egg count for redworm and ascarids	Saliva test for tapeworm
WINTER	Worm for possible encysted redworm, resistance test to check drug efficacy	

Of these only moxidectin and 5 day courses of fenbendazole are effective against **encysted stages** of small redworm.

There is now documented cyathostome resistance to the older chemicals, fenbendazole and pyrantel. These drugs should only be used if a resistance test has been carried out to confirm efficacy. Please ask for more details.

Egg reappearance times for other wormers are also reducing which is the first sign of developing resistance to these chemicals. It is therefore imperative that we use targeted parasite control programmes to slow the development of resistance and prolong their effective use.

For this reason moxidectin use should be preserved for winter dosing only and other chemicals used when necessary at other times of year.

Where there is no resistance then they are still useful drugs and it is worth noting that pyrantel and fenbendazole would be the preferred treatment for roundworm or pinworm infections.



**Worming Questions?** Please contact our friendly team of SQPs for free veterinary approved advice.





## EQUINE ROUNDWORM

*Parascaris equorum*

### ROUNDWORM IN HORSES

**Parascaris equorum**, or ascarids, are large creamy white worms, up to 40cm in length, most commonly found in foals and youngsters under four years of age. Young horses are susceptible to roundworm because their immune systems are not fully developed to be able to fight off an infection.

Occasionally these parasites also affect older horses - those grazed on pastures previously occupied by wormy youngsters or who have had a poor start in life - but the majority of adult horses have a good level of resistance.

### Symptoms

Infection can have a devastating effect, especially in foals that may quickly accumulate massive worm burdens, leading to severe debilitation, poor growth, and even death. Intestinal obstruction or inflammation is a big risk causing constipation or diarrhoea while migrating larvae breaking into the lungs may cause haemorrhages. Look out for lethargy, weight loss, coughing, a rough coat or pot belly.

### Prevention

Good pasture management, regular worm counts and appropriate worming are important. Ascarid eggs can survive in the ground for many years as they are encased in a tough outer shell which protects them from freezing temperatures and dry conditions.

- Remove droppings from the pasture 3-4 times per week.
- Avoid overgrazing your fields with too many horses
- Alternate grazing every year for mares and foals where possible
- Worm foals proactively every 6-8 weeks until 6 months old
- Worm count regularly thereafter and treat accordingly

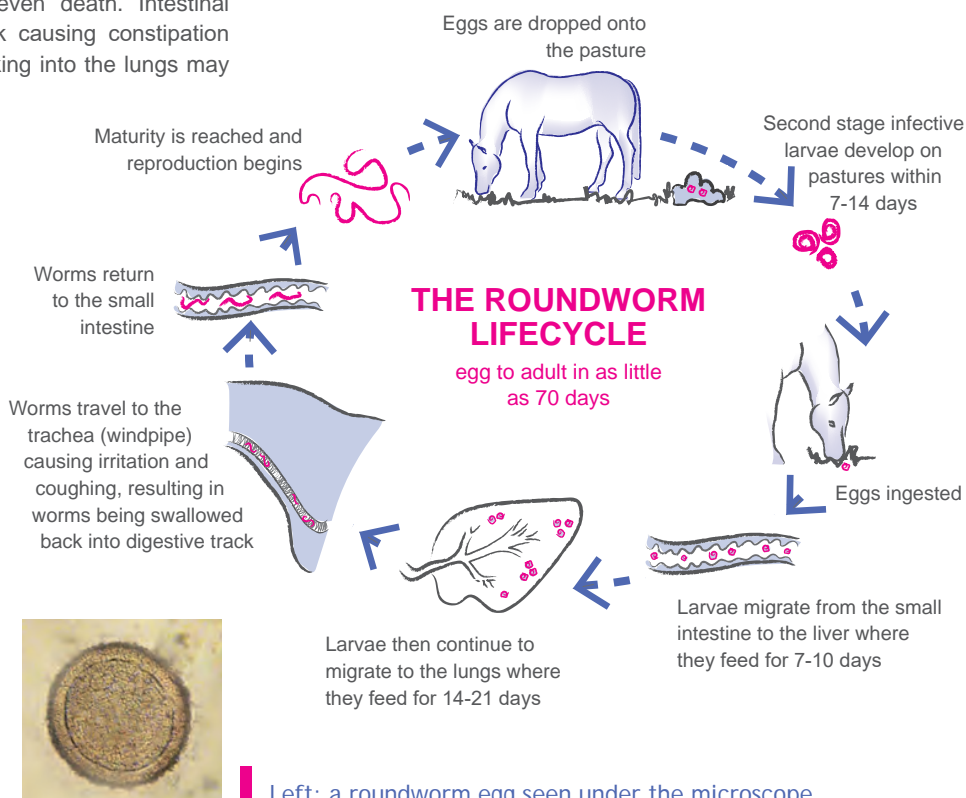
### Treatment of roundworm

All broad spectrum wormers are licenced to treat roundworm, however there is documented drug resistance to ivermectin and moxidectin based wormers so they are less effective.

- Treat with fenbendazole or pyrantel based wormers

**Worm counts** are a useful tool in the control of roundworm and should be carried out every 3 months, the horse wormed accordingly. The test monitors adult worms that are actively laying eggs. (Immature roundworm do not lay eggs).

**Worming Questions?** Please contact our friendly team of SQPs for free veterinary approved advice.



Left: a roundworm egg seen under the microscope



## EQUINE TAPEWORM

*Anoplocephala perfoliata*

### TAPEWORM IN HORSES

There are three species known to affect horses; **Anoplocephala perfoliata** (the most common), **Anoplocephala magna** and **Anoplocephaloides mamillana**.

Tapeworm live in the ileocaecal junction (between the small intestine and large intestine where the caecum is connected) and small intestine. They sucker onto the horse's gut wall and live off food that the horse ingests.

### Symptoms

Saliva testing of horses in the UK has shown that around 27% are infected with tapeworm parasites. This is fewer than we once thought but we still need to be vigilant as their presence can result in physical damage to the gut tissue and cause serious problems such as diarrhoea, weight loss and colic.

Only 27% of horses need tapeworm treatment

### Testing with EquiSal

The innovative EquiSal test is a simple to use saliva test that detects harmful tapeworm infections in horses. It works by scientifically measuring antibody levels to the tapeworm parasites that the horse produces. This accurately detects levels to give a result of low, borderline or moderate/high and indicates whether treatment is required.

The test was developed by Austin Davis Biologics and is available direct from Westgate Labs. Unlike the ELISA blood

### Two drugs are available to treat tapeworm:

- Double dose of **Pyrantel** eg. Strongid P
- **Praziquantel** available in combination wormers with ivermectin eg. Equimax, Eqvalan Duo etc. and with moxidectin eg. Equest Pramox or as a single chemical available from your vet.

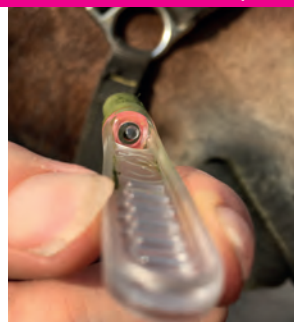
test, owners can take samples themselves without the need for a vet using a specially designed saliva collection swab that is inserted into the horse's mouth.

By combining the test with regular worm counts we can now target treatment to all three parasite groups that are the major threat to horse health. Horses should be tested for tapeworm every 6 months, at least 4 months after the last tapewormer has been given.

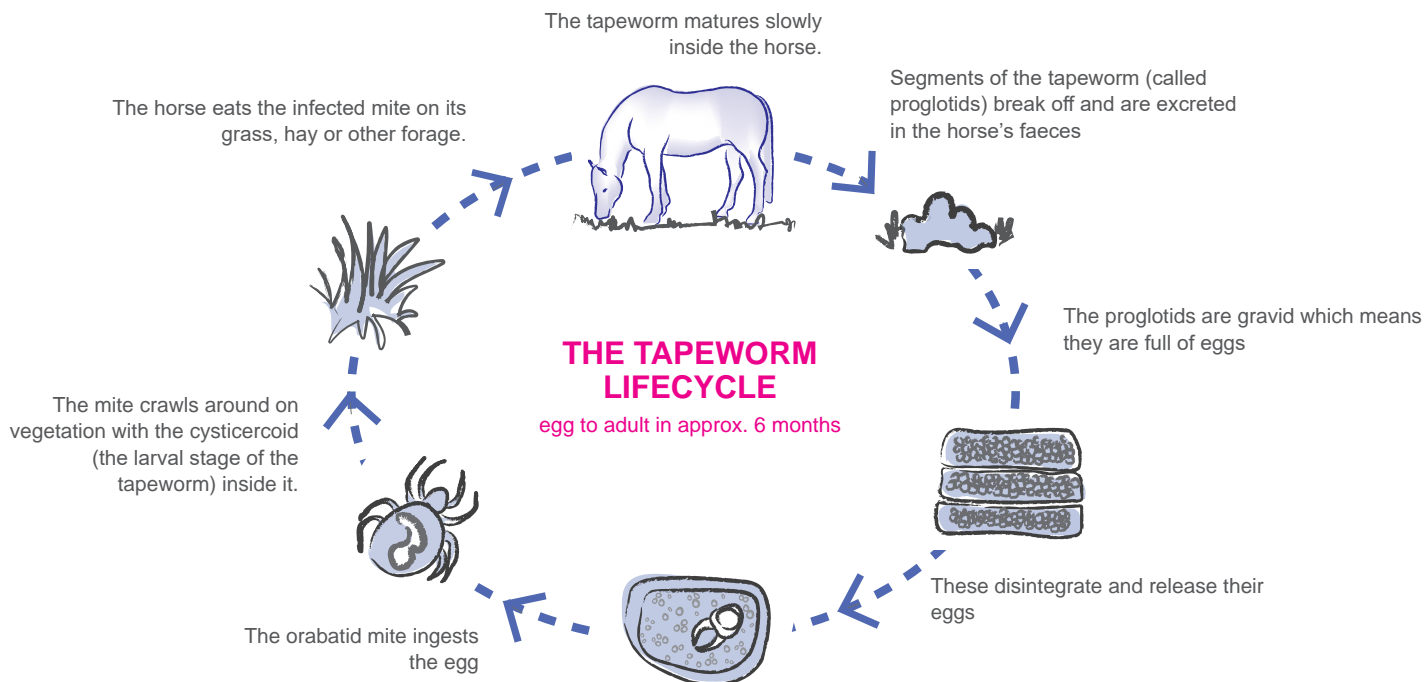
**Resistance:** The test can also be used to ensure any treatment has been effective and monitor potential wormer resistance. Take an EquiSal swab two months after worming for tapeworm to check drug efficacy.

Below left to right; Place the cotton swab into the interdental space; the indicator turns pink when enough saliva has been collected; put the swab sample tool into the tube of preservative solution; flat white segments of the tapeworm can occasionally be seen in the dung.

Horses must not have eaten, drunk or been exercised for 30mins prior to sampling...







**Worm counts:** Tapeworm eggs are often seen under the microscope in a worm egg count but the test is not definitive because the eggs are laid in packets rather than being evenly distributed like redworm and roundworm.

## Treatment

Worming is only required if results indicate that infection is present. Evidence based treatment saves unnecessary chemicals, slowing the build up of resistance to these important drugs as well as being better for horse health and the environment.

Tapeworm treatment was traditionally done in spring and autumn, at the start and end of hunting season. This can prove a useful aide memoir but as long as the gap is six months apart it does not matter when in the year you choose to test.

It can make sense to combine your winter dose for encysted redworm and tapeworm treatment using Equest Pramox between December and February. Alternate the use of praziquantel with double dose pyrantel to slow resistance. Pyrantel will also have some effect on adult stages of redworm.

In rare cases horses with high tapeworm burdens can develop a syndrome known as post-dosing colic. Veterinary advice should be sought to tackle this burden.

## A TARGETED WORMING PROGRAMME

A veterinary approved programme for healthy adult horses

SPRING	Worm egg count for redworm and ascarids	Saliva test for tapeworm
SUMMER	Worm egg count for redworm and ascarids	
AUTUMN	Worm egg count for redworm and ascarids	Saliva test for tapeworm
WINTER	Worm for possible encysted redworm, resistance test to check drug efficacy	

<b>EquiSal Tapeworm Saliva Score</b>	< -0.09	-0.09 to 0.6	> 0.6
<b>Tapeworm diagnosis</b>	Low	Borderline	Moderate/High
<b>Tapeworm treatment recommended</b>	No	Yes	Yes

Above: EquiSal Tapeworm saliva score results

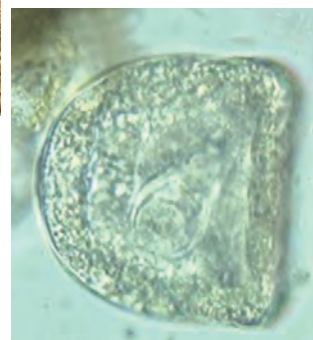
## How are horses infected with tapeworms?

Horse tapeworms rely on an intermediate host to spread the infection. The oribatid mite is a tiny creature which lives on grassland and in forage. The horse picks up the tapeworm eggs from his pasture whilst grazing or from hay and straw. The tapeworms are relatively slow growing and take months to reach maturity in the horse's gut.

Mites are thought to be more common on permanent pastures and acidic soils and less likely on chalky downland or short-term grass leys.



Anti-clockwise; Forage can be a potential source of infection; an oribatid mite, the intermediate host of the tapeworm; a tapeworm egg



**Worming Questions?** Please contact our friendly team of SQPs for free veterinary approved advice.



## EQUINE PINWORM

*Oxyuris equi*

### PINWORM IN HORSES

Concern about cases of pinworm (*Oxyuris equi*) has been on the increase over the last few years. The life cycle is different to the majority of other worms found in the horse's gastrointestinal system in a number of ways:

- Pinworm eggs are ingested by the horse, hatching to live in the intestine. There is no intermediate host and no migration through any other organ in the body.
- The life cycle is also relatively long; worms can take up to five months to mature. Immature stages of the worm are less sensitive to wormers so may survive post treatment.
- Eggs are laid on the skin surrounding the horse's bottom and not passed in the faeces like other worms. A sticky residue which contains the eggs can sometimes be seen around the anus of infected horses.

A  
sellotape  
test will  
determine  
pinworm egg  
presence

### The sellotape test

To test for pinworm take a sellotape impression from under the horse's tail. Test kits are available from Westgate Labs.

1. Collect the sample in the morning, ideally before 9am. Pinworm are most active at night so this will give the best chance of detecting any activity that is present.
2. Take a 4" length of clear sticky tape and press this firmly onto the skin around the anus (not the hair).
3. Fold the tape in half, sticky side to sticky side.
4. Pop the folded piece of tape into the sample bag ensuring this is clearly labelled.
5. Post to Westgate Labs in the prepaid envelope with your completed paperwork selecting how you want to receive your results.

The sample will be put under the microscope in the laboratory to look for the presence of pinworm eggs.

### Effects in horses

Fortunately pinworm does not cause a problem to the horse's digestive system or internal damage like other worms. However infection can cause irritation, sometimes so severe that horses will rub themselves raw around their tail head; this can lead to skin infections and further problems.

If a pinworm problem is suspected then a worm count is unlikely to show the worm eggs because they are not laid in the droppings. Instead use the more reliable sellotape test.

### Treating pinworm

If pinworm is confirmed then one of the more old fashioned wormers like pyrantel (Strongid P) or fenbendazole (Panacur 5 day guard) is a good choice of treatment. Couple this with good stable hygiene to prevent reinfection. For persistent cases you may need to contact your vet who could prescribe treatment off licence.

Below left to right 1-3: taking the sellotape test  
Below right: Pinworm eggs seen under the microscope



Worming Questions? Please contact our friendly team of SQPs for free veterinary approved advice.





## LUNGWORM

*Dictyocaulus arnfieldi*

### LUNGWORM IN EQUINES

The lungworm, *Dictyocaulus arnfieldi* is, as its name suggests, a lung parasite that affects donkeys and other equines. Donkeys are their preferred host and it is rare for an infection in horses to result in the development of egg producing adults.

Nevertheless lungworm can cause clinical symptoms in both species, particularly where horses graze alongside donkeys or mules, although the levels of risk are relatively low. Mules can also contract lungworm although it is uncommon.

### How are equine's infected?

Dr Faith Burden, Veterinary Projects Manager for the Donkey Sanctuary, is keen to dispell misconceptions about parasite infection levels in donkeys in the UK. She commented:

“““

“It is often quoted that up to 70% of the UK's donkeys are infected with lungworm. Our study to determine levels of parasite infection in donkeys new to The Donkey Sanctuary, over a four year period, showed that only 4% were infected with lungworm.”

Donkeys, horses and ponies can live together very safely, providing we are alert to the potential for lungworm and address this in a parasite control programme with your vet or SQP.

Larvae ingested by the horse or donkey penetrate the wall of the intestine and migrate through the circulatory system to the lungs where they develop into adults. The lungworm takes 5-6 weeks to reach maturity, growing up to 8cm long and resides in the bronchi and bronchioles of the lungs.

Lungworm are more prevalent on wet grazing land. The larvae can live in the ground for a considerable length of time, so good pasture management such as poo picking and cross grazing with other species can help to reduce infection without the need to rely on chemicals.

### Symptoms

The presence of the worm in the lungs can cause significant damage especially in poor animals when there is an overwhelming number. Infection irritates the mucosa leading to parasitic

bronchitis and mucus is produced, causing difficulty in breathing, severe coughing, and loss of appetite.

Severe bronchitis is often accompanied by chronic pneumonia, pulmonary edema, and secondary bacterial infection. Heavy infections can also block small airways, leading to fatality, particularly in foals.

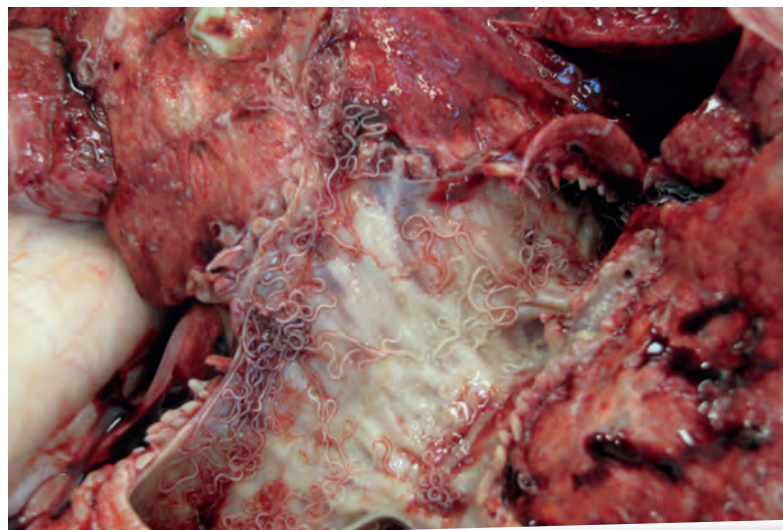
Donkeys seem to tolerate even a large infestation of lungworms without showing clinical signs beyond sometimes harsh lung sounds/lack of thrift while horses that contract the parasite usually express clear symptoms of coughing and rapid breathing.

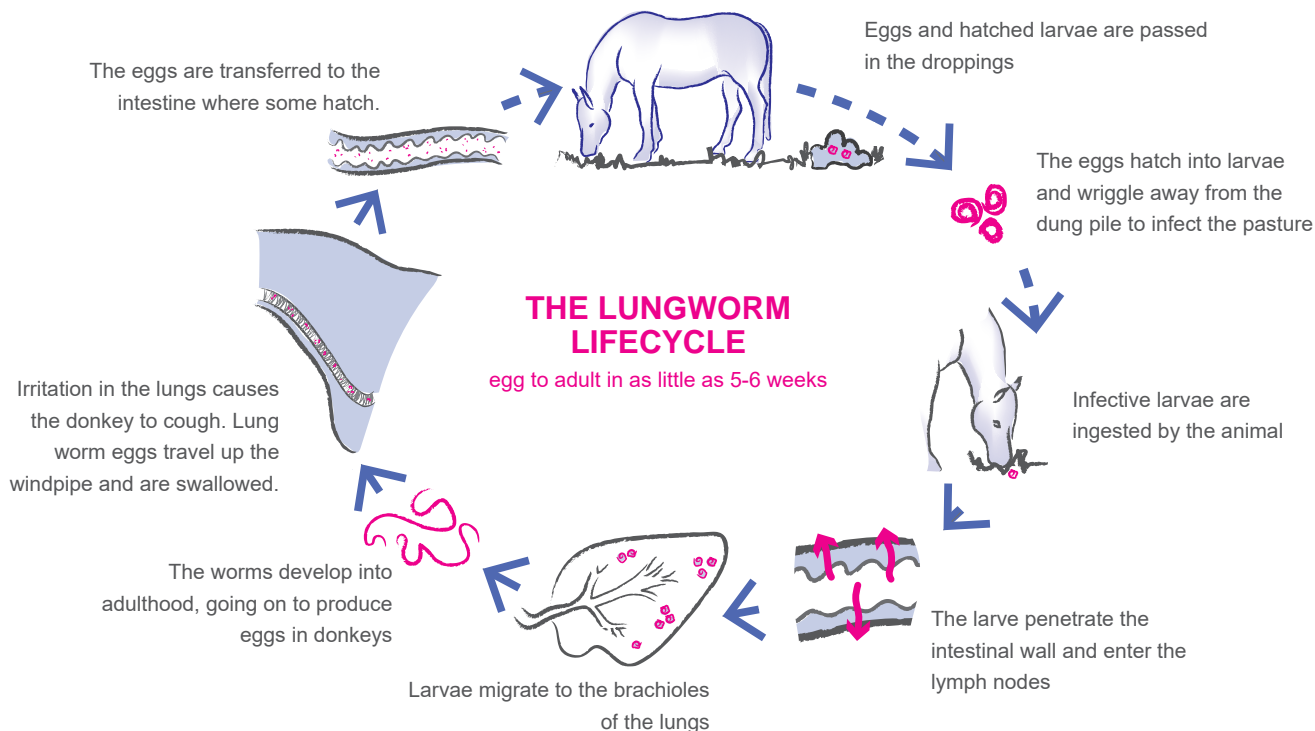
### Sedimentation test for lungworm

If a lungworm infection is suspected then a faecal sedimentation test can be used to confirm this in the laboratory. This separates out the comparatively heavy eggs of the lungworm from the faecal matter for identification under the microscope. Because the parasite rarely reaches egg laying potential in the horse, it is often better to test the donkeys or mules thought to be the host of infection, rather than the horse that is showing symptoms.

P.T.O.

Below: a fatal infection of *Dictyocaulus arnfieldi* in the lungs of an affected donkey during post mortem





Testing is carried out all year round and treatment is recommended if any evidence of lungworm infection is seen in the sample.

**A sedimentation test requires twice the amount of faecal matter than a worm egg count** and takes 3-4 days to complete.

## Treatment for lungworm

Ivermectin and moxidectin are the most effective treatments for lungworm. Both can be used in horses but not all ivermectin based wormers or moxidectin are licenced for use in donkeys. If in doubt, check with your vet or SQP.

The Donkey Sanctuary recommends using the Eqvalan brand over generic ivermectin wormers because of treatment results they have seen in their animals.

## General guidance on worming donkeys

In line with all equines the British Equine Veterinary Association advocate a targeted worm control programme for donkeys based on worm counts and tests. Treatment should be given only if the tests indicate and for specific seasonal problems like encysted redworm, lungworm, bots and pinworm. This is to help slow down resistance to the drugs as well as being better for the donkey and the environment.

## A TARGETED WORMING PROGRAMME

A veterinary approved programme for healthy adult horses and donkeys

SPRING	Worm egg count for redworm and ascarids	Saliva test for tapeworm
SUMMER	Worm egg count for redworm and ascarids	
AUTUMN	Worm egg count for redworm and ascarids	Saliva test for tapeworm
WINTER	Worm for possible encysted redworm, resistance test to check drug efficacy	

Worm counts should be carried out every three months to test for redworm and roundworm and an EquiSal saliva test taken every six months to test for tapeworm. While the EquiSal test has not been scientifically validated on donkeys at post mortem level, we still test many donkeys with good effect. Foals, youngstock and those who have had a poor start will require more attention.

A winter dose for the possibility of encysted redworm should be given between December and February with a 5 day dose of fenbendazole with a resistance test to test efficacy (moxidectin is not licenced for use in donkeys).

If tapeworm treatment is required then double dose with pyrantel is advised as praziquantel is not licenced for use in donkeys.

Mules should be treated in line with advice on donkeys.



**Worming Questions? Please contact our friendly team of SQPs for free veterinary approved advice.**





## LIVER FLUKE

*Fasciola hepatica*

### LIVER FLUKE IN HORSES

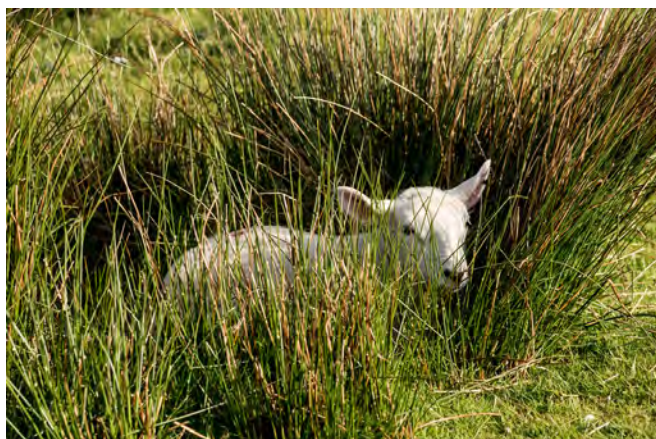
Liver Fluke (*Fasciola hepatica*) is a flat, leaf-like parasite found in the liver of grazing animals, most commonly sheep and cattle, where it can have a devastating impact on livestock health. The adult, which is usually about 2- 3cm long, has tiny sharp spines that irritate the bile ducts and cause damage to the liver tissue.

Temperature and moisture levels in the current and previous year have a major impact on fluke populations with animals kept in wetter, warmer locations being much more at risk, particularly those grazed in marshy or boggy fields. This is because the parasite relies on a small mudsnail as its intermediate host and these thrive on waterlogged, reedy pasture.

The disease is on the increase in many parts of the UK due to changes in weather patterns. While little is known about fluke infection in horses they appear to be somewhat more resilient to them than cattle and sheep. Conversely detection is also more difficult.

### Symptoms

Liver fluke infection in horses can be associated with general signs of ill thrift such as poor performance or growth rates



in youngsters, weight loss, inappetence, colic and anaemia (due to fluke feeding on the blood of the animal). A tendency to a dry coat and mild jaundice can also be a feature. Signs consistent with liver disease appear in more advanced cases, the most obvious of these are oedema (swelling under the chin, on the chest or on the bottom of the abdomen) and severe weight loss as well as chronic diarrhoea that is watery and/or dark in appearance.

The severity of disease seen depends on the numbers of infective cysts ingested and the time period over which they are ingested. More extreme signs (including death) found with liver fluke infestation in cattle and sheep are rare in horses.

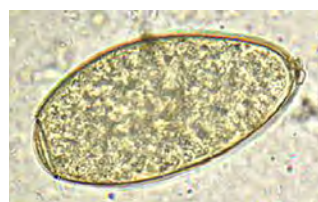
### Detecting Liver Fluke

A worm egg count is the most common way to check for the presence of fluke eggs using a different solution to ensure flotation of the heavier eggs of the fluke, using a composite dung sample taken over a three day schedule.

**P.T.O.**

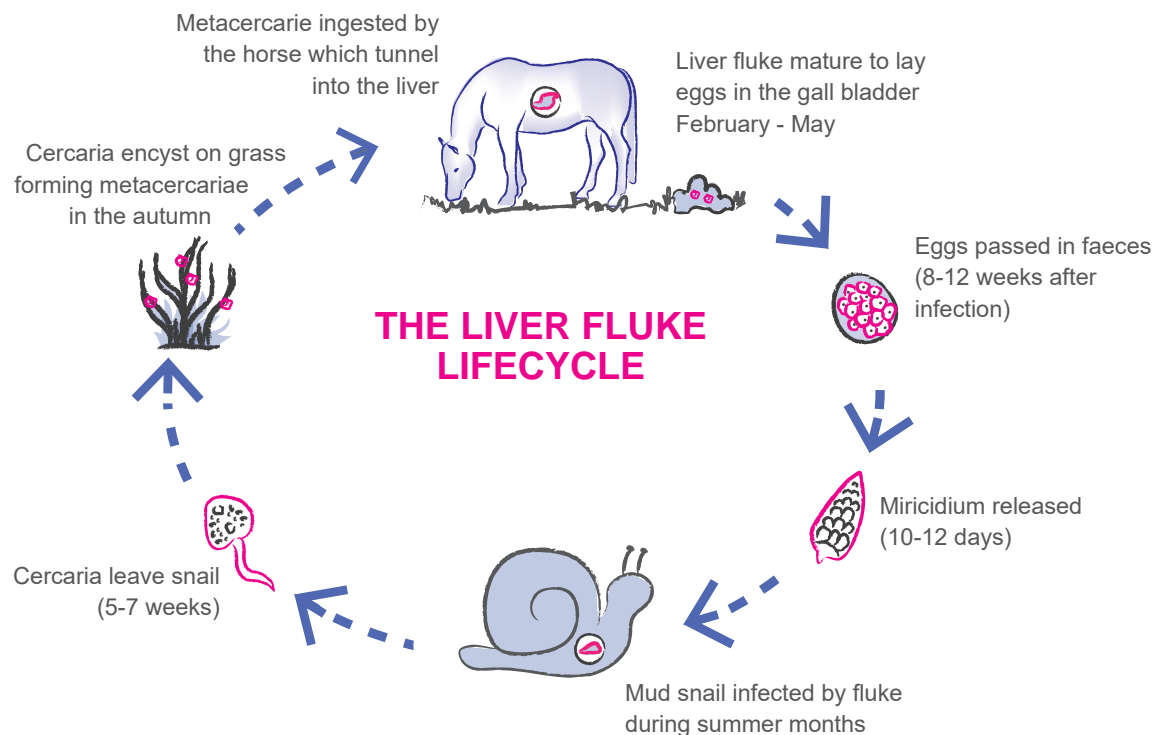
### TREATMENT OF LIVER FLUKE

There are no drugs for liver fluke currently approved for use in horses. If treatment is advised Triclabendazole, a member of the benzimidazole family of anthelmintics, is one of the most effective treatments but this medication must be prescribed off licence by a vet. It should be noted that some drugs used to treat fluke in cattle and sheep can be toxic for horses.



Left:  
A Liver Fluke  
egg under the  
microscope

Far left:  
Reedy pasture  
associated with  
fluke risk



Unlike sheep and cattle, infected horses do not excrete fluke eggs in their faeces as reliably. For this reason a liver fluke test requires three separate faecal samples taken on three consecutive days to give the best chance of detection, refrigerating the first two samples before posting to the lab on the third day to give the best possible chance of detection.

## Liver Fluke Sampling Instructions

Due to its complex life cycle a worm egg count test for liver fluke is best carried out between February and May to pick up adult, egg laying stages of the parasite.

1. Use the glove to pick about five small pinches from different places of a fresh dung pile.
2. Press the dung into the sample container, filling it to the top to exclude air.
3. Label the sample with the horse's name and date the sample was taken. Please write in ball point pen as water based inks may wash off. Refrigerate the sample.
4. Repeat steps 1 to 3 twice more on consecutive days until you have collected three samples in total per horse.
5. Put the containers into the plastic bag. Do not put any paperwork in with it.
6. Put samples, paperwork with payment or voucher into post-paid return bag. Pop it in the post box.
7. Test results will be returned to you on day of testing usually by email or SMS.

Even when adult egg-producing fluke are present the egg production itself can be intermittent. For this reason a negative test for fluke eggs does not mean the horse is clear. Despite this a worm egg count for liver fluke following the veterinary advised schedule is still considered a useful tool.

If there is a history of cattle and sheep in the same area being affected by fluke it would be assumed that co-grazing horses will have some degree of infestation.

Alternatively the University of Liverpool has developed an ELISA test to detect antibodies against liver fluke and indicate a current or recent infection.

## Management

The Liver fluke has a complicated two host life cycle involving the water snail *Lymnea truncatula*, in which the larval stages develop and multiply. Successful disease reduction in sheep and cattle is seen by limiting access to waterlogged, marshy areas of grazing, either by fencing or draining of land.

**THINK:** liver fluke in equines on wet, reedy land, particularly where they are cross grazed with sheep or cattle.



**Worming Questions?** Please contact our friendly team of SQPs for free veterinary approved advice.





## BOTS

*Gasterophilus spp.*

### BOTS IN HORSES

Bot flies are medium to large brown striped insects, 10-20mm long, a bit like a scrawny wasp or drone bee with a single pair of wings. Their life cycle involves four distinct stages—egg, larva, pupa, and adult fly and they rely exclusively on an equine host to complete this, spending the majority of their time inside the horse.

The three main species that effect UK horses can be differentiated by where they lay their eggs on the horse:

**G. intestinalis** (the common bot) lays pale yellow eggs on the hair of the body, most usually the shoulders and forelegs. These eggs are ingested into the horse's mouth as it rubs itself, the moisture and warmth of the mouth prompting the eggs to hatch a pinhead-sized larvae in about a week which burrows into the gums, or beneath the tongue.

Much less common is **G. nasalis** (the throat bot) which lays yellow eggs around the chin and throat under the jaw area of the horse's face and **G. haemorrhoidalis** (the nose bot) which lays black eggs on the hair around the horse's lips. Eggs of these larvae hatch and crawl into the mouth within a few days to burrow into the gums and beneath the tongue.



treat  
with a  
single dose  
after the  
first frost

For all species these tiny motile larvae stay in the mouth for three – four weeks before emerging to make their way slowly down to the gastro intestinal tract to burrow into the gut wall. The common bot attaches to the top part of the stomach, the throat bot to the small intestine around the duodenum and the nose bot to the mucous membranes of the stomach or rectum.

### GEOGRAPHIC LOCATION

Bot species are geographically more active in the South and Midland areas of the UK with little to no activity being reported north of Yorkshire.



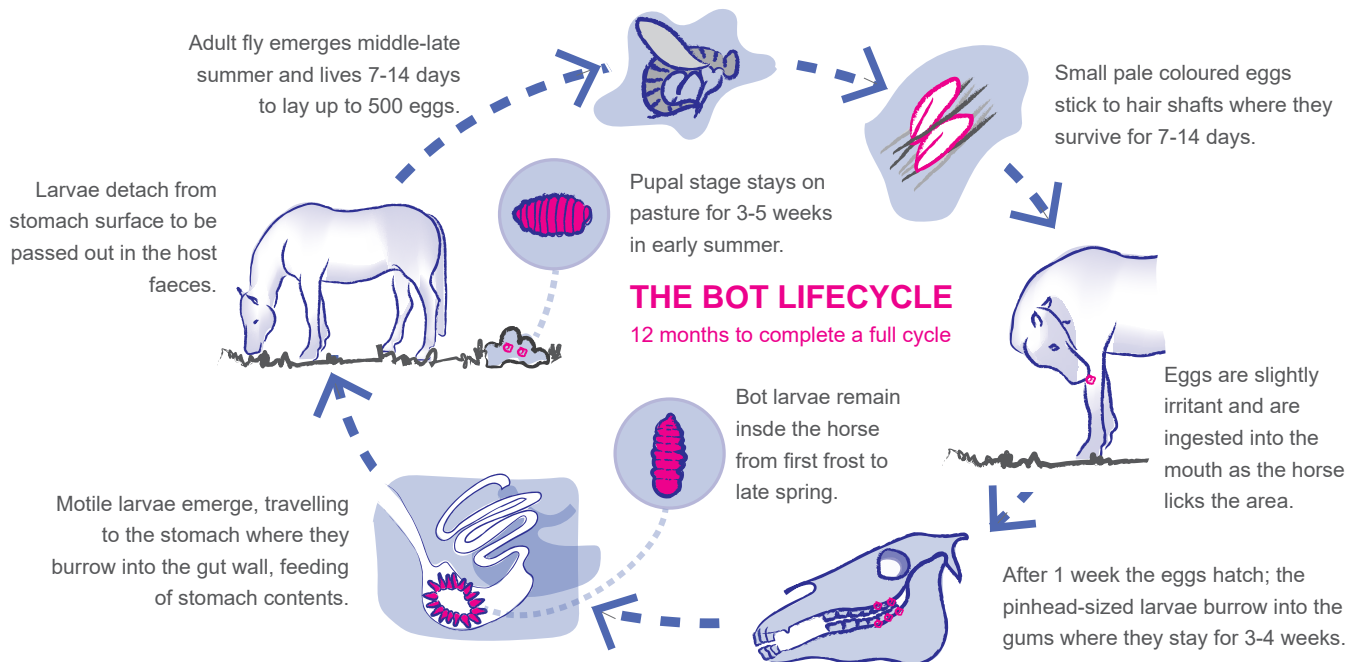
Here the larvae remain for around 10-12 months, feeding off the contents of the horse's gut and maturing until spring or early summer when they will detach from their surface to be passed out in the host faeces. They are only found on pasture, as they do not survive well on stable bedding. The pupae are known to be sensitive to frost and moisture, so the environmental conditions present play a significant role in the success of the parasite.

The larvae pupate in the soil for 3–5 weeks, after which the adult bot fly emerges. Once hatched the adult flies survive long enough to mate and lay eggs, dying once nutrients remaining from their larval stage are used, usually in around 2 weeks.



Far Left:  
Eggs of the Common bot  
fly laid on horse hair

Left:  
The bot fly  
© Janet Graham  
[www.flickr.com/  
photos/130093583@N04/](http://www.flickr.com/photos/130093583@N04/)



## EFFECTS

Only in rare or extreme cases will bots cause disease or discomfort to occur in the horse and large numbers can be present with no clinical signs.

The first instars (larvae) migrating in the mouth can cause inflammation of the mouth and gums and in rare cases, purulent discharges to form in the sinus tracts.

Once in the intestinal tract severe infection can impact a horse's ability to digest its food, resulting in a decline in condition. Bots can cause a mild gastritis by damaging the stomach lining, their burrowing causing ulceration and abscesses which can trigger colic. Digestive juices can aggravate the ulceration with the potential for breaches of the stomach lining which can prove fatal through peritonitis. Fortunately these events are extremely rare.

## DETECTION

Bot infection can be hard to detect. There's no way to test for the presence of larvae in the horse and it's rare to see the larvae expelled in the dung. If bot eggs have been seen on a horse in a herd it should be presumed that all horses need a worming treatment for them.

Below:  
A bot knife, available through the Westgate Labs shop, is ideal for removing eggs laid on the horse's coat



## MANAGEMENT & TREATMENT

Although we discuss 'worming' to treat these parasites they are not technically worms like redworm or roundworm but flies. There are only specific times when treatment will be effective depending on their life stage.

**FLIES:** Insect repellents can be used to try and repel the bot fly but these won't deter them entirely.

**EGGS:** Once eggs are laid on the coat these can be scraped off the hairs using a bot knife or blunt metal edge to try and minimise infection.

**LARVAE:** Ingested larvae aren't treatable until they're in the stomach of the horse. Veterinary guidance is to target them with a single treatment, waiting until after the first frost of the winter which will kill bot flies and ensure no more reinfection. Ivermectin and moxidectin are both effective chemicals and you could choose to combine this with your winter worming dose against encysted redworm.

**PUPAE:** Sensitive to frost and moisture.



Worming Questions? Please contact our friendly team of SQPs for free veterinary approved advice.





### TICKS

*Ixodes spp. & Dermacentor spp.*

#### TICKS IN HORSES

Ticks are tiny bloodsucking parasites of mammals (including horses, humans, dogs and cats) whose prevalence is on the rise in UK. They belong to the taxonomy group called Acarina, together with spiders, mites and scorpions.

Species vary in colour from reddish to dark brown or black and differ in size, depending on the type, age and sex of the tick, and whether they have fed. Empty ticks are as little as 0.5mm (the size of a poppy seed) up to 3mm (sesame-seed-size) and small, oval and flat. Once fed, the engorged body becomes considerably bigger to resemble a grain of rice or small bean.

Ticks don't have wings to fly and cannot jump; they travel by walking on the ground and up plants, attaching onto passing or resting hosts by using special hooks on their legs.

There are over 20 species of ticks in Britain; most have been known to attach to people or pets. Which species are most abundant depends on the area, habitat and surrounding wildlife but three particular ticks are most common; *Ixodes ricinus* (the sheep tick, wood tick, deer tick or castor bean tick); *Ixodes hexagonus* (the hedgehog tick); *Dermacentor reticulatus* (the marsh tick).

Below: Varying sizes of the unfed tick



Wildlife and farm livestock are the most usual tick hosts but as horses, people and pets send out the same signals (body heat and chemicals), a questing tick will instinctively climb on board from the tip of grasses or leaves of shrubs and bushes.

#### TICK ACTIVITY

After climbing onto a host a tick will crawl around searching a good place to bite before attaching to start its blood meal which can last up to three days. They then drop to the ground for moulting or egg laying.

As a consequence of this behavior, the highest number of infesting ticks will be found in and around places most visited by livestock: water and feeding points, preferred resting places (e.g. below large trees in the pastures), etc. In such places a horse may pick up several ticks.

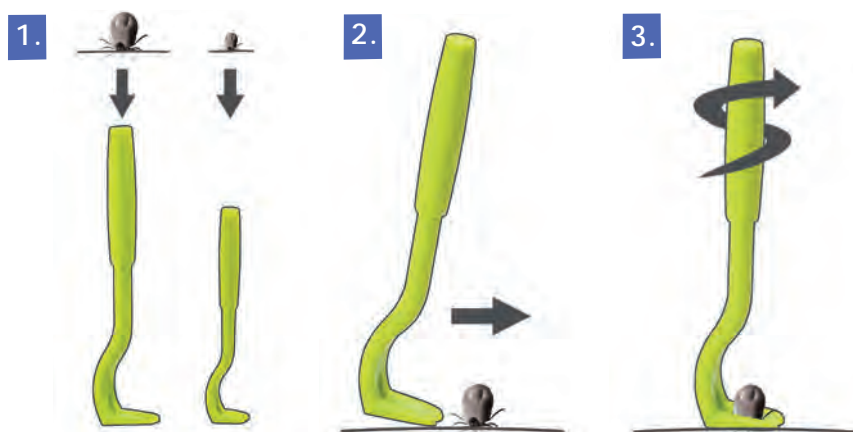
#### RISK TIMES & AREAS

Ticks are more prevalent in areas of high livestock and/or wildlife density, typically in rural areas such as forests, woods and areas of grassland such as heath and moorland.

Some areas of the UK are often referred to as tick 'hot spots' such as the New Forest, Exmoor, the South Downs, Thetford Forest, the Lake District, the North Yorkshire Moors, and the Highlands and Islands of Scotland. However, there can be localised 'hot spots' in many areas.

While tick bites are generally more of a risk April – November they can be active at temperatures as low as 3.5°C. They use plant debris to shelter in during cold weather and as our winters get warmer it is increasingly likely to see incidences and populations increase.





1. Choose the most suitable tool, according to the size of the tick.
2. Engage the tool by approaching the tick from the side until it is held securely.
3. Lift the tool very lightly and turn it. The tick detaches itself after 2-3 rotations.
4. Disinfect the bite site and wash hands with soap and water.
5. Monitor the animal for signs or symptoms of disease such as temperature, lethargy, loss of appetite or any other signs of general ill health.

Removing a tick with the O'Tom Tick Twister available from Westgate Labs

## EFFECTS

Suffering one or two tick bites is rarely problematic for an animal; only in larger numbers do they become a source of irritation and potential anaemia through blood loss. Very occasionally would a host be overwhelmed by the general toxæmia and immune challenge that can occur when exposed to sufficient tick saliva.

More worryingly many ixodids can transmit a variety of potentially dangerous microbial diseases, including Lyme Disease (Borreliosis), Babesiosis, Anaplasmosis/Ehrlichiosis, Bartonellosis, Q-fever and the Louping ill virus.

## LYME DISEASE

Lyme Disease is a serious tick-borne infection caused by the bacterium *Borrelia burgdorferi* that can affect any animal including humans. Clinical signs appear in less than 10% of infected horses, the most common symptoms being lameness and behavioral changes.

The lameness is usually associated with larger joints and frequently shifts from limb to limb. The horse may appear to have a generalised stiffness, sometimes with fever. Laminitis has occasionally, been associated with Lyme disease.

Behavioral changes are also difficult to determine. As well as an unwillingness to work (potentially associated with musculoskeletal pain), owners frequently observe increased irritability and a changed attitude in these horses.

Diagnosis of Lyme disease in horses is particularly difficult for two reasons: horses are subject to many musculoskeletal injuries and abnormalities that can result in lameness that may not always be associated with Lyme disease; the blood tests commonly used for diagnosis detect antibodies to *Borrelia burgdorferi* and since subclinical exposure is common, a positive antibody test only indicates that the horse has been exposed to *Borrelia burgdorferi*, not that his illness is related to Lyme disease.

## TICK REMOVAL

Although not every tick carries disease, immediate removal of an attached tick is recommended. The longer a tick is allowed to feed, the more organisms can pass into the bloodstream of the host. Regular checks will also help to find them before they have had a chance to attach and feed. Use a safe method of tick removal such as the O'Tom Tick Twister.

**DO NOT** use petroleum jelly, any liquid solutions, or freeze/burn the tick, as this is likely to stimulate it to regurgitate saliva and stomach contents, increasing the chance of infection.

A tick bite can cause irritation and reddening at the bite site. This reaction is common and caused by the body's immune response against the tick's saliva. It will usually settle down within the first couple of days without requiring veterinary attention. A topical bite relief cream can be used to make the area more comfortable.

Scratching at a tick bite (or any insect bite) can introduce bacteria and cause a localised infection. Seek medical advice if there are continued signs of reddening, swelling and heat, or weeping at the bite site.

You may want to save the removed tick for identification in case the person or animal becomes ill over the following weeks. To preserve it write the date of the bite in pencil on a piece of paper and put it with the tick in a sealed plastic bag and store it in a freezer. Your vet can then identify that a tick bite has occurred and use this information to assist in making an accurate diagnosis.

A vaccine against Lyme disease is now available for dogs in the UK & Ireland but no such preventative is currently available for horses. Talk to your vet for more information.



Above: A biting tick on the skin of an animal

Worming Questions? Please contact our friendly team of SQPs for free veterinary approved advice.





## PREGNANT MARES, FOALS & YOUNGSTOCK

### A HEALTHY START FOR FOALS

Effective parasite control is a vital part of giving young horses a healthy start in life. Foals are born free of parasites but are often exposed to them within the first few days of life. Youngsters are especially vulnerable as their immune systems take time to mature. They will need a careful schedule of tests and treatment to ensure the wellbeing of mum and baby.

#### The mare in pregnancy

Good management begins before the foal is born. The mare should be monitored with worm egg counts every three months and tapeworm tests every six months, treating as the results indicate plus a winter dose for encysted redworm. Check with your vet or SQP to ensure any wormers are licenced for use in pregnant mares.

Keep the pasture as clean as possible by poo picking or cross grazing, resting paddocks and taking care not to overgraze the fields. Foals and young stock are especially vulnerable to ascarids. Due to the thick sticky shell of the ascarid egg these parasites can survive extremes of hot and cold and remain dormant on pasture for many years which is why fresh grazing is recommended for mares and foals.

#### Due date

**Threadworm** or *Strongyloides westeri* is the first parasite to be concerned with. The female worm of this species has the ability to penetrate the horse's skin and, once there, can remain in the body tissue for many years. Threadworm can also be passed through the mare's milk to infect the foal. There is some debate about whether threadworm is harmful - it was once thought to be a potential cause of chronic diarrhoea in the foal but this is now refuted by leading parasitologists\*. New thinking is that strongyloides is actually harmless to the foal - the choice is with the owner as to whether you would prefer to worm as a preventative for it or not.

In order to treat for threadworm the mare should be wormed proactively with a dose of moxidectin (Equest) four weeks before the foaling due date or an ivermectin based wormer around foaling time - our preference if you're going to treat is to use the

moxidectin wormer as we prefer not to give chemicals around such a critical time as foaling. Healthy foals should acquire a natural immunity or tolerance to this parasite at around six months of age.

young  
horses are  
especially  
vulnerable  
to parasite  
infection

#### Foaling to one month

The mare should not be wormed until at least two weeks after foaling unless under veterinary supervision - this is because metabolites from the wormer can be passed through the mare's milk to affect the foal.

#### One month to six months

**Ascarids**, roundworm or *Parascaris equorum* are huge creamy white worms which can grow to 40cm in length, a very large worm for small foals to carry. They reproduce in large numbers and an infected youngster can produce a frightening barrow-load of these worms after treatment.

Clinical signs of infection would be poor weight gain, unthriftiness, pot belly or rough coat due to the compromising effect of the parasite on the foal's growth and development. The size and quantity of worms can form intestinal blockages leading to colic and ruptures of the gut while migrating larvae cause coughing and respiratory damage through pulmonary haemorrhaging.

Below: large worms of the ascarid expelled in faeces



When the foal is a month old treat with a generous single dose of fenbendazole (Panacur), effective for ascarids – it is difficult to accurately assess the weight of a foal so err on overestimating to ensure an effective amount is given. (This drug has a particularly high safety margin, with the dose needed to cause toxicity in horses at over 50 times the normal dose for deworming).

Continue to worm the foal every 4-6 weeks alternating between pyrantel and fenbendazole until the foal is six months old. As with threadworm, healthy young horses should develop natural immunity to ascarids at around 2-4 years of age - though cases are not unusual in older horses that have had a poor start in life.

Two months after foaling resume three monthly worm egg counts for the mare, treating as necessary.

## Six months to yearling

As the foal gets older and grazes more, the risk of other parasites such as the small and large redworm - and tapeworm take over. If the foal is grazing with several other horses then a first tapeworm test should be given at 6 months old using the Equisal saliva test. If tapeworm is present they can be dosed using either a double dose of pyrantel or a single dose of praziquantel.

From 6 months of age worm egg count every 6-8 weeks until a yearling only worming if needed. Continue testing the mare at three monthly intervals.

Worm both mare and foal for the possibility of encysted redworm in winter. Small redworms are one of the most common and harmful

parasites found in horses. They are at their most dangerous in their larval stages when they burrow into the lining of the gut and encyst. In this stage they don't lay eggs and so their presence can't be detected by a worm egg count. Untreated these encysted small redworm pose a potentially fatal health risk to horses as they can emerge en-masse from the gut wall in spring, causing loss of condition, digestive upsets and colic. Use Panacur 5 day Guard for lean youngsters or Equest if they have a good covering of body fat.

## General Notes

- Moxidectin is not a suitable drug for young foals until they have a sufficient covering of body fat. Equest is licenced for use from 4 months and Equest Pramox from 6.5 months.
- Ivermectin is not the best choice of product for routine dosing of young horses as there is some known resistance to ascarids.
- If you have any health concerns about your mare or foal please consult a vet.

While it goes against advice for worming adult horses, young foals need proactive treatment to protect them from parasites. Incorporating worm counts and tests into the programme early on will help to identify the wormy horses and those that are going to need more support, preventing any potential problems developing from unnecessary parasite burdens.

**Worming Questions? Please contact our friendly team of SQPs for free veterinary approved advice.**

## An example worming programme for a mare and foal born on May 1st

DATE	MARE	FOAL
<b>Conception &amp; Pregnancy</b>		
Summer	Worm Count	
Autumn	Worm Count, Saliva test	
Winter	Encysted redworm dose, plus resistance test to check for treatment efficacy	
April	Saliva test for tapeworm Moxidectin or Ivermectin for threadworm	
<b>1st May foal is born</b>		
June 1st	(The mare should not be wormed until at least 2 weeks after foaling unless under veterinary supervision)	When the foal is 4 weeks old give a single dose of fenbendazole (Panacur). Treat every 4-6 weeks until 6 months old rotating with pyrantel and fenbendazole (single doses)
Early July	Worm Count	Worm with pyrantel
Mid August		Worm with fenbendazole
Mid to late Sept		Worm with pyrantel
End of October	Worm Count and tapeworm test	Worm with fenbendazole Tapeworm test, treat if necessary
<b>1st November foal is 6 months old</b>		
Mid Jan	Encysted Redworm dose plus resistance test to check for treatment efficacy	Encysted Redworm dose plus resistance test to check for treatment efficacy
Early March		Worm Count
End April	Worm Count and tapeworm test	Worm Count and tapeworm test
<b>1st May foal is 1 year old</b>		
Summer	Worm Count every 3 months	Worm Count every 2-3 months depending on previous results





Westgate  
LABS



/ LAB TEST



/ HORSES



/ SAND TEST

## FAECAL SAND TESTING

### SAND COLICS IN HORSES

Sand is a relatively common cause of colic in horses in certain parts of the country. Animals ingest it as they graze and it can accumulate in the colon over time. Here it irritates the gut lining and, in sufficient quantity, also has the ability to cause impaction of the gut which, if not treated in time, can be fatal. Many horses with sand colic have intermittent mild colics over periods of weeks or months before building up to a more severe episode.

**Always call your vet if you suspect colic.**

#### Classic colic signs;

- Mild depression and inappetence
- Pawing, rolling, flank watching, getting up and down, standing as if to urinate or thrashing.
- Horses with sand colic may also have had diarrhoea before the onset of the symptoms.

sand tests  
can be used  
to monitor  
sediment  
levels in at  
risk horses



Above: Sand is a relatively common cause of colic in horses.

Right: A sediment test can be performed to measure sand levels.

### SAND TESTING

Horses presenting with sand colic usually have a history of grazing on sandy soils, overgrazing paddocks or being fed in a ménage. For equines in these risk categories a faecal sample can be taken at intervals through the year and checked for sand to assess the levels in the gut. This is done by dissolving dung in water and observing the amount of sediment that settles in the sample overnight.

#### Results

Test results from Westgate are expressed as a percentage to give a quantitative measure of the level found. While it's not desirable to find any sand in faeces, some healthy horses are not affected by a small amount. For this reason positive tests should be discussed with your vet on a case by case basis. Together you can determine whether other symptoms such as diarrhoea/colic are also present and devise an appropriate management and/or treatment protocol.



Sand levels will be expressed as a % of the total sample volume





1. Grazing sandy soil, particularly grass that is short or sparse, can predispose a horse to pick up sand.
2. A diet high in forage assists in clearing sand from the gut.
3. If in doubt consult your vet



With the variables of gut movement it is possible for the test to generate a false negative and show no sand in the faeces of horses that are carrying a burden. For this reason we include two kits; if no sand is detected in the

first sample then take a second a few days later.

If sand is detected in the first test then the second can be used to retest the horse following management adjustments.

Abdominal ultrasound and X-rays can also be used to detect sand in the gut, although X-rays may not be easy in larger horses and require a powerful machine.

## TREATMENT

Conservative treatment is usually successful if started early. Horses are given oral laxatives such as psyllium, with or without magnesium sulphate (Epsom salts), orally. The psyllium is believed to work by increasing the gut motility and clumping the sand together so that it is easier to pass. For active colics your vet may also provide anti-spasmodics and pain relief to make your horse more comfortable.

Sand can also damage the lining of the gut making it more "leaky" and allowing toxins to cross into the bloodstream. For this reason, your vet may also put your horse on a course of antibiotics. Horses that don't respond to medical treatment may require surgery.



Above: Supplements based on Psyllium husk aim to help clear sand from the gut

## PREVENTION

Ideally the management of horses should be aimed at preventing the risk of sand colic. This is especially relevant if you live in a sandy soil area:

1. Don't feed horses off the ground. Use large, high sided tubs and place on rubber matting so that horses don't pick up sand when scavenging for dropped feed. Hay should also be fed in nets, again over rubber matting.
2. Avoid overgrazing pastures. Horses are more likely to pick up sand if the grass is short or sparse, forcing them to graze too close to the ground.
3. Feed psyllium to high risk horses. There are a number of proprietary products on the market which are designed for feeding to horses or alternatively feed the straight herb - either 250g once a day for one week every month or 250g one day a week.

Avoid daily treatment as this can damage the gut flora, limit the nutrients your horse can absorb from their feed and can become less effective over time as the body becomes overused to it.

While not every horse on sandy soil needs prophylactic treatment with psyllium, this may be of benefit to horses showing intermittent mild colics and who have high levels of sand in the faecal float test.

4. Provide access to a salt block. If horses are lacking in salt, they may attempt to eat soil.
5. Supply ad-lib hay. A diet high in forage can assist in clearing any ingested sand. A recent study in the University of Florida compared four means of sand removal from the horses gut. **1.** Hay fed at 1.5% of body weight **2.** Hay fed at 2.5% of body weight, **3.** Hay fed at 1.5% of body weight plus psyllium fed in a single daily dose and **4.** Hay fed at 1.5% of body weight with psyllium fed twice daily. They found that the best results and most sand cleared were with hay fed at 2.5% bodyweight.

Advice sheet prepared by Carolyn Cummins MVB  
Phd MRCVS, consultant vet to Westgate Labs.