

Horse Healthcare - A Manual for Animal Health Workers and Owners

Author(s): *David Hadrill*

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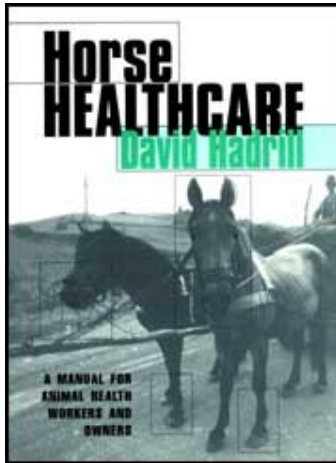
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David Hadrill



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Health Workers and Owners

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8. Lumps under the skin

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8.1 Different kinds of swellings

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Common swellings appearing as lumps under the skin are abscess, rupture, hernia, haematoma, tumour, cyst and oedema.

Different kinds of swellings

<i>Name of swelling</i>	<i>What it is</i>
Abscess	<ul style="list-style-type: none"> • caused by infection • consists of pus
Rupture, hernia	<ul style="list-style-type: none"> • often follows injury • some of what is normally inside the belly, for example,

	abdominal fat or a loop of intestine, comes through a hole in the layers of muscle under the skin and lies under the skin
Blood blister or haematoma	<ul style="list-style-type: none"> • a swelling containing blood • happens when an injury causes bleeding under the skin
Cyst	<ul style="list-style-type: none"> • contains fluid from a gland
Growth or tumour	<ul style="list-style-type: none"> • a growth caused by the rapid division of cells • some tumours seed secondary growths in other parts of the body • other growths just get bigger where they are
Oedema	<ul style="list-style-type: none"> • caused when fluid accumulates within tissue • can result from an allergic reaction

8.2 Abscess and how to recognize and treat it

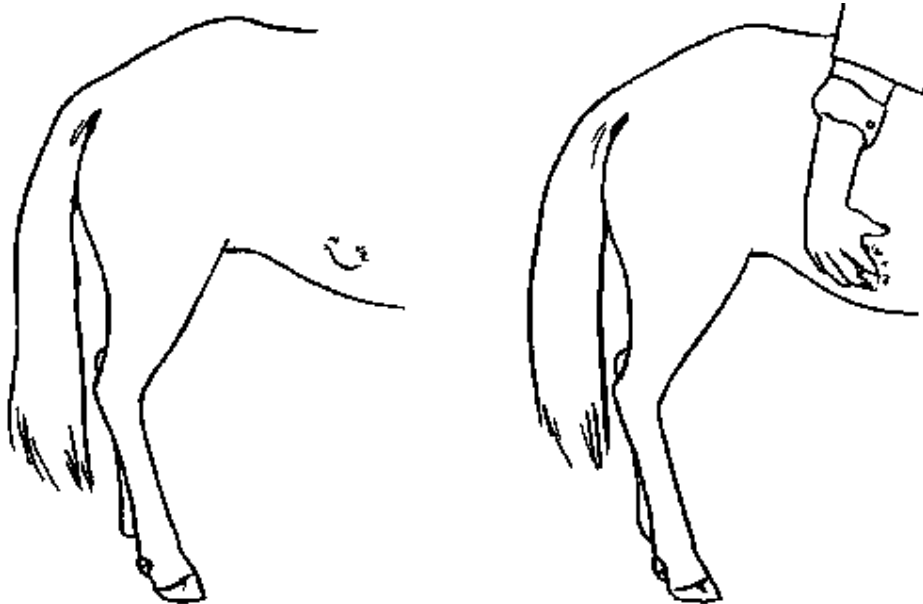
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It is very important not to mistake a hernia or rupture for an

abscess. Because an abscess is a swelling with pus beneath the skin like a very large boil, the aim when treating it is to get the infection (pus) to drain away completely. This may involve 'lancing' or cutting the skin. Hernias or ruptures are usually below the belly and may contain internal organs like a loop of intestine. Cutting a swelling like this could be disastrous. Be careful.

What a hernia or rupture looks like

- **Suspect a hernia or rupture particularly when the swelling is around the testicles or the body wall.**
- **Feel the swelling carefully. Can you feel a loop of intestine or something else which is not fluid in the swelling? Can you push the contents of the swelling back into the body? If so it is probably a rupture or hernia which may need surgery.**



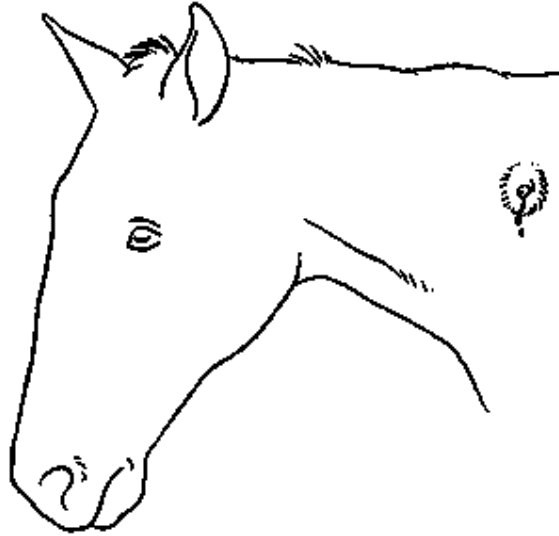
A hernia or rupture can normally be pushed back in.



- **Do not try to treat a hernia or rupture. Contact a veterinary surgeon.**

What an abscess looks like

- **Abscesses are usually hot and painful when touched, but hernias and ruptures that have been there for some time often are not painful. Haematoma, oedema, cyst and tumour swellings are not normally painful.**
- **If it is an abscess there may be a scar on the skin where there was a wound which allowed the infection in.**
- **Gentle squeezing pressure may cause pus to drip or even burst out if it is 'ripe'.**



- **An abscess is often hotter than the surrounding skin and may be quite painful: the animal may respond when you touch it.**
- **Because of the infection in an abscess the animal's temperature is often higher than normal.**

How to confirm that a swelling is an abscess

If the infection does not burst and discharge the infection naturally and if you are confident that the animal does not have a hernia or rupture, it is useful to find what kind of liquid is inside the swelling. This can help to show that a suspected abscess really is an abscess, or it may give clues to what other kind of swelling it is.

HOW TO TAKE A SAMPLE OF LIQUID FROM A SWELLING

- **Use a new, disposable needle or boil a used one for 10 minutes first.**
- **Cut the hair over the swelling and wash it with soap and water.**
- **If you have some alcohol or spirit wipe the skin with a cotton pad soaked in it before inserting the needle.**
- **Carefully push a wide-bore needle attached to a**

syringe into the lump and suck back some of the liquid.

The kind of fluid found helps decide what kind of swelling it is. The table below shows the fluids you may suck back from the different kinds of soft swellings.

Kinds of fluid found in different types of swellings

<i>Type of swelling</i>	<i>Kind of liquid found in the swelling</i>
Abscess	Abscesses usually contain creamy white, bad-smelling pus; sometimes the pus is bloody
Tumour or growth	Tumours are often solid and it may not be possible to withdraw any fluid
Cyst	Cysts contain fluid (e.g. cysts on the side of the head may contain saliva)
Haematoma	Bleeding under the skin causes a haematoma: you may

or blood
blister

suck back fresh blood or clotted blood and serum, which looks like watery blood

If you sucked back some pus from the swelling, and the other signs fit, it is probably an abscess. Proceed with the treatment described in the next section. If in doubt, get help from a veterinarian if possible.

How to treat an abscess

The best way to ensure that an abscess will drain completely is to get it to ripen, burst and drain naturally. You can encourage this process by bathing it with hot compresses.

HOW TO BATHE AN ABSCESS

- **Mix salt or Epsom salts (magnesium sulphate) in water as hot as you can comfortably bear your hands in. Add a teaspoonful of salt in 1 pint or 0.5 litre of water.**
- **Soak a piece of clean cloth or cotton wool with this**

solution and hold it on the swelling.

- **When the cloth gets cool soak it in the hot solution again.**
- **Continue for about five minutes.**
- **Do this at least four times a day.**

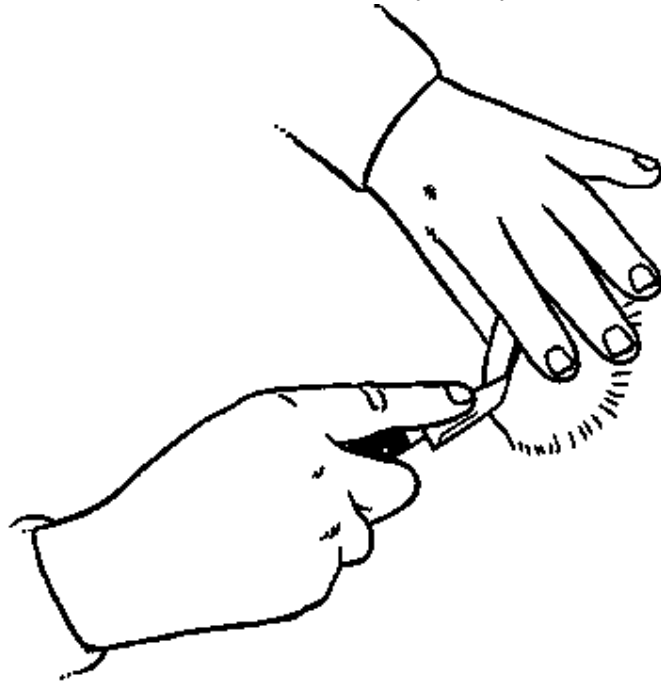
The skin may soften and break, discharging pus, which usually smells foul. Keep on bathing with salt solution to encourage the drainage to continue so that no pus remains inside when the skin closes and heals.

If the abscess does not burst, it may be necessary to lance it.

HOW TO CUT (LANCE) AN ABSCESS

- **Use a very sharp, very clean blade.**
- **Cut away the hair over the abscess with scissors.**

- **Wash the skin with soap and water.**
- **Wipe skin with spirit or alcohol if you have it.**
- **Cut boldly through the skin to let out the pus. Cut through the lowest point (when the animal is standing) in the swelling to help drainage.**
- **Make one long, vertical cut. Push a clean finger into the hole to break down tissue and to help release the pus.**



- **Alternatively, make two cuts in a cross shape so that the skin does not heal up too fast. The aim is for all the infection to drain before the skin heals together.**
- **Be very careful where you cut around the neck or**

udder (breast tissue of mare), because there are big veins near the skin in these places that must not be cut.

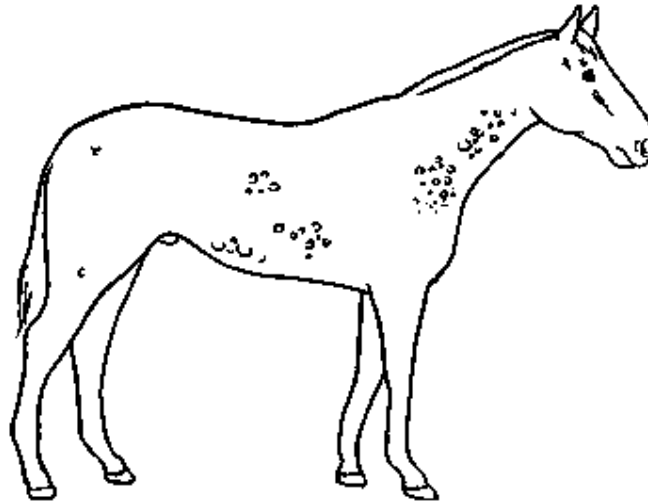
- **Where the pus is spilt dig a hole and bury it.**
- **Flush the abscess by squirting a dilute solution of iodine into the hole with a syringe. Alternatively, use hydrogen peroxide solution (diluted in water). Oxygen bubbles form and help flush out the infection.**
- **Continue to bathe the area with hot, salt water several times a day.**

If the animal is eating well and is bright after draining the abscess, an antibiotic injection is unnecessary. If the animal is sick give antibiotics as described in the section *Infected wounds*.

8.3 Oedema from allergic reaction

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Oedema swellings may be due to allergy, for example, to something eaten or to insect bites. The typical thing about oedema is that it 'pits under pressure'.



What oedema swellings look like

- **These swellings are identified because they pit under**

pressure. Pressing with a finger or thumb leaves an indentation that stays for some time.

- **Oedema swellings are not hot.**
- **They are not painful.**
- **They usually develop rapidly, in minutes or hours.**
- **Horses can develop swellings as wide as large plates.**
- **Unlike an abscess, there are usually several swellings at the same time.**

How to prevent oedema swellings

If you noticed that the horse developed the swellings after eating a particular kind of feed, avoid giving that animal the same thing to eat in future. Allergic swellings are not infectious, and the same food may be perfectly safe for other animals in the

group.

How to treat oedema

- **Usually no treatment is necessary. It can help to hold a cloth or cotton wool soaked in ice-cold water on the swelling.**
- **If the animal is distressed, inject a corticosteroid medicine. See the list of medicines at the back of the book.**

8.4 Bee stings

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Bee stings can cause swellings under the skin. To treat, dissolve sodium bicarbonate in water. Soak cotton wool or a cloth in this and apply to the stung places.

8.5 Haematoma, blood blister

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These swellings usually occur after the skin has been banged, resulting in bleeding under the skin.

What haematoma swellings look like

- **They are found on the part of the body that has been banged, such as the hip, shoulder or head.**
- **The swelling is soft at first, but does not 'pit under pressure' like oedema.**
- **Less painful than an abscess.**
- **If an empty syringe and needle is put into the lump, blood or serum with blood clots is sucked back.**

How to treat a haematoma

An uninfected haematoma swelling can be left alone. As it heals,

a haematoma eventually becomes hard. The blood clots and then the serum is absorbed. Later, as scar tissue forms, the swelling shrinks.

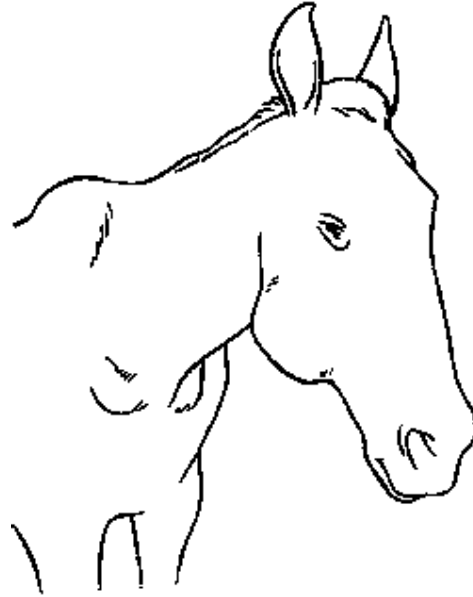
If a haematoma becomes infected, treat it like an abscess.

A haematoma sometimes develops between the layers of skin in the ear flap. A haematoma between the layers of skin of the ear flap eventually causes 'cauliflower ear'.

8.6 Tumours and cysts

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Sarcoids and melanomas are the names of the commonest types of growth seen on the skin. Melanoma swellings are more often seen on grey/white horses than on horses with dark, pigmented skin.



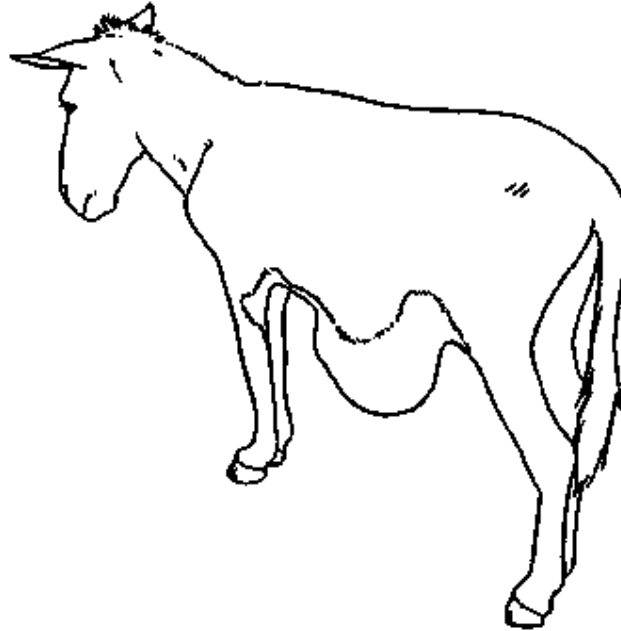
Refer to a veterinarian for treatment. When large melanoma tumours grow in several different parts of the body, euthanasia is appropriate. Other tumours that stick out from the skin are

mentioned in the chapter *Diseases and parasites of the skin.*

Cysts contain fluid from a gland. For example, a cyst on the side of the head may contain saliva. Refer to a veterinarian for treatment.

8.7 Hernias and ruptures

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The picture shows a very large hernia or rupture type of swelling in a donkey. Whether large or smaller, the only treatment is surgical. This must be done by a veterinary surgeon. In most cases treatment is not essential, and after some weeks they become painless.

8.8 Purpura

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Purpura or purpura haemorrhagica is a rare disease with a variety of signs that include oedema swellings under the skin. It may be mild or very severe. Horses may recover from the mild form in a week, but many cases with the severe form die, in spite of treatment.

What mild purpura looks like

- **Oedema swellings under the skin as for allergic reactions,**
- **stiff muscles,**
- **horse unwilling to move,**
- **normal temperature and heart rate.**

What severe purpura looks like

- **Big oedema swelling, especially over the head and**

legs.

- **The skin may crack over the swelling and ooze liquid.**
- **Small blood spots under the skin show on the mucous membranes such as the inside of the eyelids (see the section *How to check mucous membranes*).**
- **Difficult breathing.**

What causes purpura

The exact cause is not known. Purpura sometimes follows an infection, particularly strangles.

How to treat purpura

NURSING CARE

Provide comfortable, bedding. Give tasty food (see the section *Thin animals* for advice on feeding). Make sure fresh water is

always available. Gentle exercise, for example walking, may help reduce the swellings.

CORTICOSTEROIDS

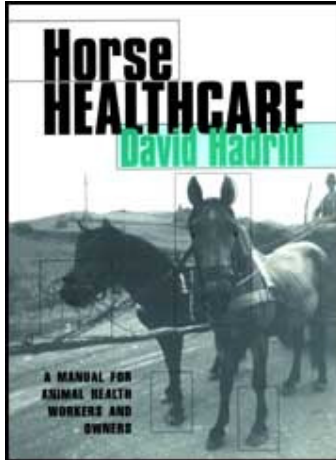
Corticosteroids should be given until the signs of purpura are reduced.

Inject a corticosteroid drug such as betamethasone or dexamethasone. See list of medicines at the back of the book for doses.

Alternatively, give corticosteroid treatment using prednisolone tablets, crushed and mixed in the food. The dose is 5 mg prednisolone per 10 kg body weight of the animal. Give this dose twice daily.

ANTIBIOTICS

Give injections of penicillin for five days.



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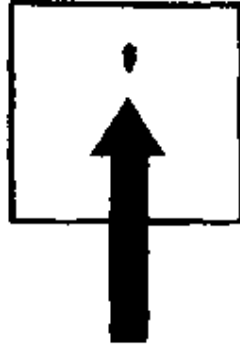
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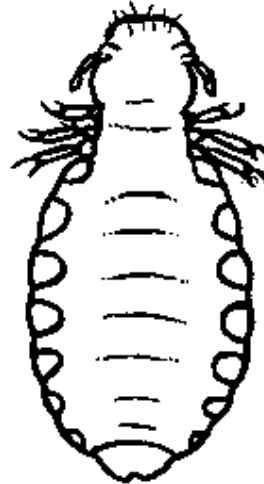
9.1 Lice

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Adult lice are a few millimetres long, large enough to see moving around between the hairs. Lice bite the skin to feed, which irritates the animal.



Actual size



Magnified

What lice infestation looks like

- **Lice cause itchiness and the animal may rub and lick itself a lot.**
- **Lice are found especially in the mane and the tail.**
- **There may be flakes of dead skin in the coat.**
- **Lice are seen more often on poorly fed and young animals.**

One kind of louse (called *Haematopinus*) is larger, about 5 mm long, and these yellow-brown coloured insects can be seen fairly easily. The other kind of louse (called *Damalinia*) is smaller and pale, but can be seen as specks in the hair. With both kinds of louse, their whitish-yellow eggs (nits) can be seen glued on to hairs.

How to prevent lice infestation

- **Prevent spread between horses by thoroughly washing all blankets. Saddlery, and other things that contact the animal's skin should be treated with the same drug used to kill lice on the animal. Grooming equipment should be scalded with very hot water.**
- **Groom the animal regularly. Lice are more common on a thick coat (the winter coat in cool climates) and less often seen after the winter coat is shed. Brush the loose hairs out of the coat. Destroy these hairs (bury or burn) and treat the brush.**

How to treat lice infestation

Treatments normally kill the adult lice, but the eggs remain to hatch later. Therefore, give a second treatment two weeks after the first treatment, in order to kill lice which have hatched from the eggs.

- **Insecticide sprays or powders (see section at back of**

book) are effective. See the section *How to spray medicine on to skin* in the chapter *How to give medicines*.

- **Ivermectin, more often used against worms, is effective against one type of louse (*Haematopinus*) found on horses, but less effective against the other type.**










9.2 Flies











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Horses hate flies. Flies irritate them and cause diseases. Flies also carry diseases and spread worms that infect wounds and eyes. The table shows some of the problems caused by flies.

Diseases caused and carried by various types of fly

<i>Diseases caused by the</i>	<i>Diseases carried by fly</i>	<i>Type of fly</i>	<i>Actual size</i>	<i>Magnified</i>

fly				
Maggots in wounds	Summer sores, habronemiasis	<i>Calliphora</i> , etc. blowfly, bluebottle		
Screw worm		<i>Chrysomya</i> , <i>Cochliomyia</i> screw worm flies		
Sweet itch, irritation	African horse sickness, onchocerciasis	<i>Culicoides</i> midge, no-see-um		
Stomach bots, gadding (panic)		<i>Gasterophilus</i> bot fly		
Irritation		<i>Haematopota</i> cleg		

Warbles, gadding (panic)		<i>Hypoderma</i> gadfly, warble fly		
Irritation	Equine encephalitis	mosquito		
	Habronemiasis (summer sores), eye-worm (<i>Thelaziasis</i>)	<i>Musca</i> housefly		
Irritation	Onchocerciasis	<i>Simulium</i> blackfly		
Irritation	Surra, habronemiasis (summer sores)	<i>Stomoxys</i> stable fly		

Irritation from painful bites	Anthrax, equine infectious anaemia, surra	<i>Tabanus</i> horsefly		
Irritation	Trypanosomiasis	tsetse fly		
Stings		Wasps, bees, scorpions and centipedes		

How to control flies

- **Many flies breed in animal dung. Make dung into compost or burn it. Alternatively spread out the dung so it dries.**

- **After drying dung in the sun, it can be burned near the animals. The smoke repels flies.**
- **Where *Stomoxys* flies are a problem, cover or remove rotting vegetation or compost as this type of fly breeds in it.**
- **Ducks and chickens eat insects. Keeping poultry helps control flies.**
- **Keep animals away from swampy places in the wet season. Cover water tanks where mosquitoes breed. Keep fish in paddy fields, because fish eat fly larvae.**
- **Make a back rubber from a sack containing insecticide dust or soaked in insecticide oil. Tie the sack around a tree or post. The animals learn to rub against it. Replace it after about a month.**
- **Insecticides and chemical insect repellents are effective, but usually too expensive to use routinely. A**

repellent can be made from kerosene and water (see the section *How to care for a fresh wound*).

Insecticides and fly repellents made from local plants

In many parts of the world, there are plants that contain substances that repel flies. Try to find local knowledge about this. Some examples are:

- **Neem tree (*Azadirachta indica*). Neem oil is effective as a repellent and for treating wounds with maggots.**

To make neem oil, remove the outside cover of the seeds.

Grind the seeds to make a sticky, brown powder.

Add a little water and then press and squeeze the paste so that the oil comes out.

- **A fly repellent can be made simply by boiling neem leaves and allowing the liquid to cool. Apply to the skin with a cloth.**
- **Sugar apple tree (*Annona squamosa*). The sugar apple tree is grown in the tropics for its fruit. Take the seeds from the fruit and crush the seeds to make a paste. This paste can be used to kill lice or maggots in a wound.**
- **Sweet flag plant (*Acorus calamus*). This is a water plant that has sword-shaped leaves and yellow-green flowers in bunches. The thick root stock contains an insecticide. The roots are dried and crushed to powder. The powder can be used to kill lice on animals.**

9.3 Mange

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Mange is caused by mites, which are very small creatures, only just big enough to see.



Actual size



Appearance of one kind of mite seen with a microscope

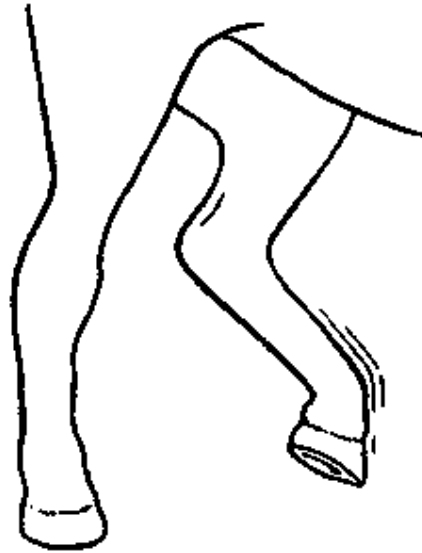
They burrow into the skin and cause intense irritation, resulting in biting and rubbing by the animal. Mange is less common and severe in horses and donkeys than in some other species, such

as goats or camels. Leg mange is the commonest type in horses.

What mange looks like

First type (leg mange, chorioptic mange):

- **The skin under the long hair around the heels is affected,**
- **thickened skin with grey scabs and surface flakes,**
- **stamping the feet.**



Second type (body mange, psoroptic mange):

- **Severe irritation,**
- **oozing, amber scabs, thickened skin and surface flakes.**
- **Different types of mange mites prefer different parts of the body, for example:**

- **near the long hair at the base of the tail or sides of the mane, or**
- **inside the ears.**

- **Shaking the head if the ears are affected (ticks can also cause this, see the section *Ticks*),**

- **rubbing of mane or tail,**

- **eventually, affected skin may have thick scabs heaped up beneath the hair.**

Third type (scab mites, sarcoptic mange):

- **Crusty, grey-brown hairless patches,**

- **severe irritation resulting in biting and rubbing,**

- **areas affected vary, but it usually occurs on parts of the body with short hair, such as the head and neck.**

To be sure an animal has mange, it is necessary to see the mites by using a microscope to examine a scraping of the skin. See the section *How to collect samples for laboratory tests*.

How to prevent mange

Mange is passed from one horse to another by contact between them, or by using the same grooming equipment or tack. Therefore, treat infected cases and keep them separate from other animals until cured. Do not use the same grooming equipment on other animals. Treat grooming equipment with insecticide.

How to treat mange

Sprays used for ticks work against mange, especially the mange mite type (psoroptic mange). See the list of suitable chemicals at the back of the book. Apply once per week and give at least four treatments. Mix the chemical carefully according to the instructions. Wear rubber gloves or plastic bags over your

hands. Use a cloth to rub the mixture into the affected areas or use a sprayer. See the section *How to spray medicine on to skin* in the chapter *How to give medicines*.

Ivermectin is effective against the scab mite type (sarcoptic mange). It may also cure the other types.

9.4 Harvest mites, heel bug

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Harvest mites are similar in size to mange and scab mites, but harvest mites live in the grass. The young stages of these creatures feed on animals' skin. They get on to the legs or face when the animals graze.

What infestation looks like

- **Intense irritation.**
- **Small, red-orange clusters of mites may be seen on the face or lower legs.**

- **The skin may ooze and drip.**
- **The heel is often affected.**
- **It occurs in summer in places with a cold winter.**

How to prevent infestation

With a solution used for ticks, wash the lower legs and face two or three times a week in the season. Replace the bedding if it is straw or hay that may have forage mites in it.

How to treat infestation

In countries with a cold climate, the disease disappears in the cold season when the mites are no longer in the grass. Spraying or washing with a chemical for killing ticks (see list at the back of the book) can give instant relief. See the section *How to spray medicine on to skin* in the chapter *How to give medicines*.

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9.5 Sweet itch

This condition is an allergic reaction to bites of midges or gnats (*Culicoides*).

Sensitive horses rub their manes and tails because of severe irritation.



**Culicoides
Actual size**





What sweet itch looks like

- **Usually only one horse in a group is affected.**
- **The skin is pink, inflamed and in thick folds.**
- **The mane, back and tail are affected.**
- **The tail may be rubbed raw.**
- **The tail base may look like an old scrubbing brush.**

How to prevent sweet itch

- **The biting insects that cause sweet itch feed in the late**

afternoon and at night. Therefore, from mid-afternoon, put the horse inside under a roof. This will greatly reduce midge attack.

- **Insect netting over the windows will keep midges out, but only if the holes in the netting are small enough. Midges can get through mosquito netting.**
- **Insect repellents or insecticide, such as synthetic pyrethroids, can be applied to the mane, back and tail.**

There is no cure. Affected horses will always have this problem when bitten by midges. In cold climates, the disease gets better in the winter when flies are not around.

9.6 Pinworm

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This disease affects stabled horses. A gut worm (*Oxyuris equi*)

causes it. The female worm is up to 15 mm long and crawls out of the anus and lays its eggs under the tail. Large numbers of eggs are sometimes seen under the tail and are known as 'rust'.

What pinworm infestation looks like

- **Severe irritation under the tail.**
- **The horse rubs its tail against posts or trees.**

How to treat pinworm infestation

- **Wash around the anus with soap or mild disinfectant solution.**
- **Treat the horse with a medicine against worms (see list at the back of the book), for example:**
 - **piperazine citrate, dose 200 mg per kg body weight,**
 - **ivermectin,**
 - **fenbendazole (Panacur).**

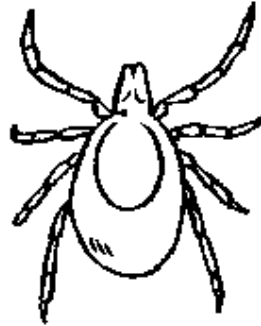
9.7 Ticks

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Ticks attach to the skin and feed on blood. Ticks spend more time in the pasture, off the animal, than feeding on it.

Diseases caused by ticks

- **Usually they do not cause much damage, but they can carry diseases, such as babesiosis.**
- **The bites can become infected, resulting in an abscess.**
- **Sometimes ticks get into the ears and cause head-shaking and distress.**
- **Rarely, some ticks cause paralysis. This has been seen in foals in Australia.**



How to treat ticks

PICK OFF BY HAND

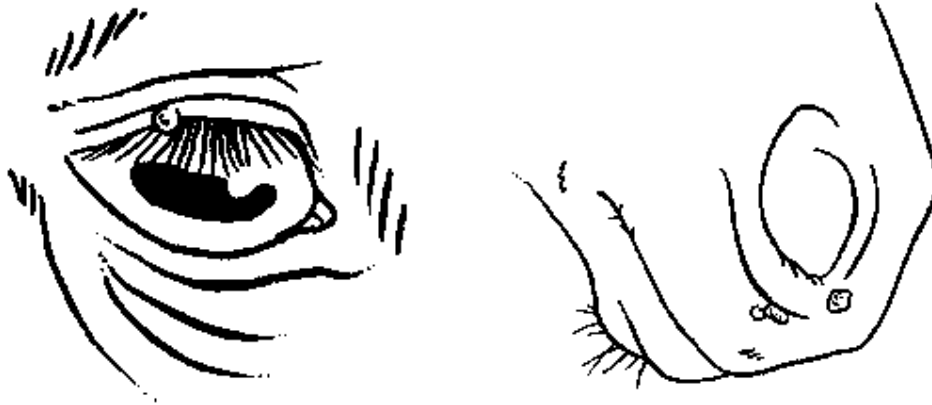
Remove from the animal by hand picking. Do this carefully so that tick mouth-parts are not left in the skin.

USE CHEMICALS TO KILL THE TICKS

Ticks can be killed with chemicals that are more commonly used on cattle (see list at the back of the book). Some of these chemicals are dangerous to animals and people, so follow instructions carefully.

- **The chemicals can be applied with a sprayer. See the section *How to spray medicine on to skin* in the chapter *How to give medicines*.**
- **Chemicals to kill ticks are also sold as 'pour-on' oils. These are easy to use, but may not have been tested on horses.**
- **Chemical can be applied using a sponge or cloth. Mix the chemical in a bucket using the amount recommended for dipping or spraying. Wear rubber gloves or plastic bags over your hands.**
- **Ear ticks can be treated with tick chemical sold for dips or sprays, but mixed with oil instead of water. Use the same dilution instructed by the manufacturer when mixing with water, but mix with vegetable cooking oil. Squirt a few millilitres directly into the ear using a syringe without a needle.**

Warts most commonly occur in young animals on the lips, nostrils, eyelids, legs or genitals. Normally no treatment is necessary and they disappear after a few months.



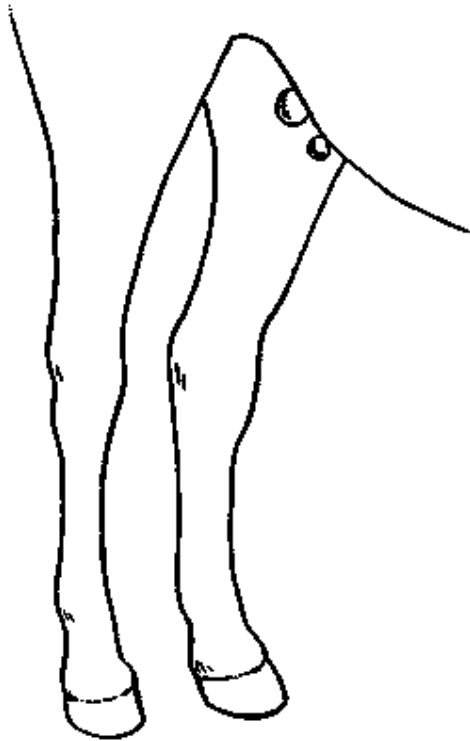
If they are a problem, for example, by interfering with the harness, tie cotton thread tightly around the base. This cuts off the blood supply and the wart drops off after a few days. Be sure the horse is vaccinated against tetanus before doing this.

9.9 Sarcoids

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What sarcoids look like

- **Lumps that first appear as hard bumps under the skin.**
- **They grow to about 3 cm diameter, sometimes bigger.**
- **As they get bigger the skin on the surface becomes raw.**



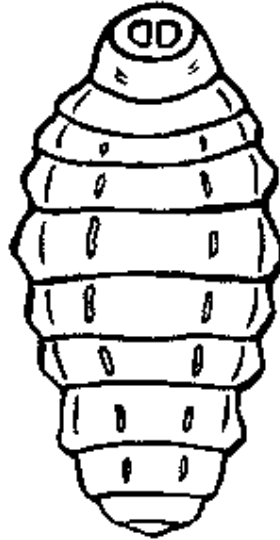
How to treat sarcoids

A trained veterinarian, who may use surgery or a cell-killing cream, should treat sarcoids.

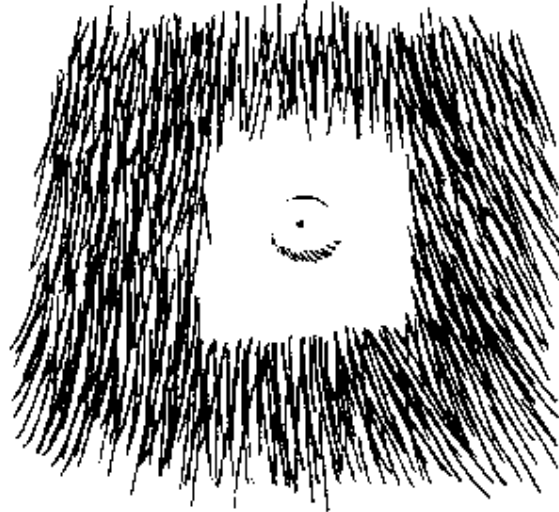
9.10 Warbles

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Warbles are bumps containing the larvae of the warble fly (*Hypoderma*). These flies live in the northern hemisphere and mainly parasitize cattle. See the section *Flies* for a picture of a warble fly.



Warble fly larva - Actual size



Bump or warble - Half actual size

What warbles look like

- **Bumps, called warbles, 1 or 2 cm wide under the skin on the back.**
- **There is a small hole in the centre of the bump through which the maggot breathes.**
- **The bumps appear in the spring.**

- **Warbles are painful and may prevent work.**

How to treat warbles

With a sharp knife, such as a razor blade, make the breathing hole larger. Gently squeeze the bump and remove the larva using tweezers. Be *very* careful not to break the larva.

9.11 Other growths, tumours

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Tumours or cancerous growths are incurable. They grow progressively. Tumours occur in older horses.

What tumours look like

Melanoma, the most common kind of tumour:

- **usually affects white/grey horses,**
- **black or brown lumps appear under the skin,**

- **these lumps may start under the tail, but later grow in other sites.**

Other types of tumour:

- **can also cause lumps under the skin, or**
- **can cause pinkish growths in animals with pink skin, for example, around the eyes.**



How to treat tumours

- **Surgery by a veterinarian is the only treatment. If it only affects one place, surgery may prevent it from spreading more.**
- **If melanoma growths have become large and have**

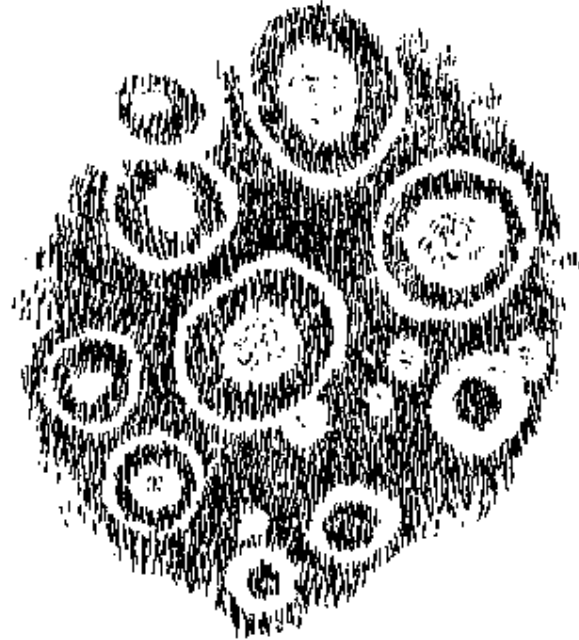
spread to involve several places on the body, euthanasia is recommended.



9.12 Ringworm, dermatomycosis

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This disease usually self-cures after around three months. It is very infectious and some forms can infect people. It is not caused by a worm, but by a fungus. It tends to grow out in circular rings, hence the name.



What ringworm looks like

- **First, round areas of raised skin appear.**
- **Next, the hair mats together.**
- **After about a week the hair falls out leaving a roughly circular patch of grey skin.**
- **There is some irritation, but not severe in most animals.**
- **It usually starts on the belly and can spread to the neck, head or rump.**

How to prevent ringworm

- **Do not let healthy animals rub against animals with ringworm.**
- **Do not share the blankets or saddles of animals with ringworm. Do not groom all animals with the same equipment. Wash your hands with soap after touching an infected horse. (It is better to wear rubber gloves when grooming a horse with ringworm so that you are less likely to catch it yourself.)**

- **Clean their housing and posts that they rub against with 'Clorox' bleach (sodium hypochlorite solution).**

How to treat ringworm

- **Most cases recover naturally, after a long period, so treatment is not always necessary.**
- **Severe cases can be treated with griseofulvin (Fulcin) added to the feed, but do not feed to pregnant mares.**
- **Treat affected skin with a disinfectant solution, for example, chlorhexidine solution (25 ml in 1 litre of water) or sodium hypochlorite solution (100 ml in 1 litre of water). Put the solution on to the ringworm with a sponge or cloth.**

9.13 Sunburn, photosensitization

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Badly sunburnt skin can occur after eating plants containing substances that make skin sensitive to sunlight. It can also be the result of liver disease, which can in turn follow poisoning with certain plants, such as *Senecio* species, like ragwort. It affects horses that have patches of white hair or pink skin.



What photosensitization looks like

- **Reddening of skin that does not have dark pigment, that is, where the hair is white and on pink skin of the eyelids, ears and lips.**
- **The skin becomes thickened and scabby.**
- **The surface layer flakes off.**

How to prevent photosensitization

Keep susceptible animals in the shade during daylight. Avoid access to areas known to have plants that cause this problem, such as *Senecio* species or wild clovers.

How to treat photosensitization

If poisonous plants have badly damaged the liver, there is no effective treatment. See the section *Liver disease*.

9.14 Summer sores, habronemiasis, bursatti

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The young forms of certain stomach worms of horses cause summer sores when they get into wounds. Flies, such as the housefly or stable fly, carry the larvae to the wound. The disease is sometimes known as swamp cancer or bursatti. The same worms cause swellings and raw ulcers on the face, below the eyes (see the chapter *Eye problems*).

What summer sores looks like

- **Lumps that grow up to 25 cm diameter and have a sunken centre.**
- **The lumps look like proud flesh covered with a thin, greyish skin.**
- **They do not cause much irritation.**
- **Common places where the lumps grow are under the belly and near the eyes.**

How to prevent summer sores

- **Remove dung and rotting vegetation where flies breed.**
- **Keep all wounds clean. Infected wounds are more attractive to flies.**

How to treat summer sores

Treat with ivermectin, dose 0.2 mg per kg body weight.

9.15 Dermatophilosis, streptothricosis

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This disease usually follows heavy wetting of the skin, which helps the infection to start in the surface layers of the skin. It is sometimes known as 'rain scald' or 'mud fever'.

What dermatophilosis looks like

- **Groups of hairs are matted together in a tuft, like a small paint brush.**
- **Tufts usually appear first on the legs or belly but can be on other parts of the body.**
- **If the tuft of hair is pulled off the hairs are stuck together by a scab.**
- **Where a matted tuft of hair was removed the skin is moist, pink and may bleed.**
- **In older, healing dermatophilosis, the hairs grow with the scab around them.**

How to prevent dermatophilosis

Keep the animals dry. Do not allow them to stand in mud.

How to treat dermatophilosis

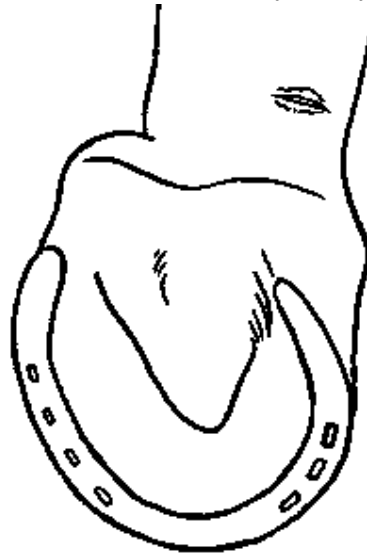
- **Many animals recover without treatment, particularly**

when kept dry.

- **Recovery is more rapid if the scabs are soaked in povidone-iodine solution and removed by hand. This may be painful, and, unless the animal is very quiet, restrain with a twitch (see the section *How to restrain horses and donkeys*). After removing scabs, apply antibiotic ointment.**
- **Intramuscular injections of penicillin, for five days.**

9.16 Cracked heel

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This condition occurs just above the heel. The cracks may become deep and infected and the horse may become lame. It may be a form of dermatophilosis.

How to prevent cracked heel

It occurs when a horse has been standing in wet mud or when the horse's legs have been washed frequently and not dried. If

the animal is on wet land, put some petroleum jelly (Vaseline) on the skin every few days. This is not necessary if the weather is dry and if the heels do not get wet where the animal walks and stands.

Cracked heel may also occur when an animal has not been properly hobbled (tied by its lower legs). Make sure that rope used for this is dry and soft.

How to treat cracked heel

- **Wash with warm water and soap to remove the scabs. Dry the area well with clean cloths.**
- **Put on some petroleum jelly or zinc oxide ointment. Repeat every few days.**
- **If lame, rest the horse. Even if not lame, do not work the animal hard until its heel cracks have healed completely.**

- **Remove ropes from the lower legs until cracks have healed.**

9.17 Vesicular stomatitis

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Donkeys and horses can get vesicular stomatitis, which causes blisters in and around the mouth. It occurs in North, Central and South America, usually in late summer. The disease is transmitted by flies.

What vesicular stomatitis looks like

- **Dribbling.**
- **The animal is not willing to eat.**
- **Blisters appear on the gums, tongue and lips.**
- **Blisters may also appear above the hooves or on the teats.**
- **Recovery occurs after about a week.**

How to prevent vesicular stomatitis

- **Keep animals in stables with mosquito netting.**
- **Keep uninfected animals away from any with the disease.**

How to treat vesicular stomatitis

There is no direct treatment. Nursing care is needed: provide the animal with soft food and keep it comfortable until it recovers.

9.18 Fly-blown wounds and screw worm

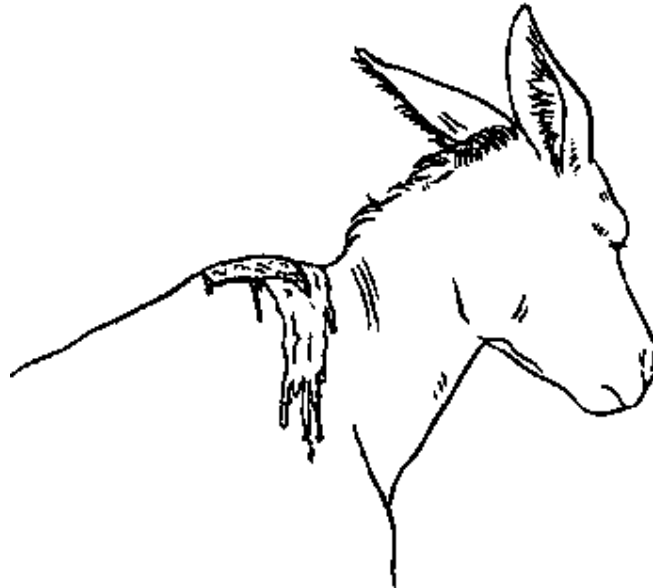
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See the section *Fly-blown wounds, screw worm* in the chapter *How to treat wounds*.

9.19 Fistulous withers and poll evil

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These conditions are names of a deep infection on the top of the head or in the neck (withers).



Fistulous withers

What fistulous withers and poll evil look like

A creamy, pus discharge bursts out through the skin. It is seen at the top of the neck from the poll infection or in front of and above the shoulders. ('Poll' is a name for the top of the head. 'Withers' is a name for the top of the neck above the shoulders.)

How to prevent fistulous withers and poll evil

- **The infections follow injury.**
- **Fistulous withers is most commonly caused by badly fitting harness. See the section *Pack animals*. Make sure a pack saddle is applied so that it does not move forward and cause injury to the withers.**
- **Poll evil can follow banging the head on the top of a door frame. Avoid these injuries with good door design.**
- **Wash your hands thoroughly with soap after touching these lesions and before touching other animals.**



How to treat fistulous withers and poll evil

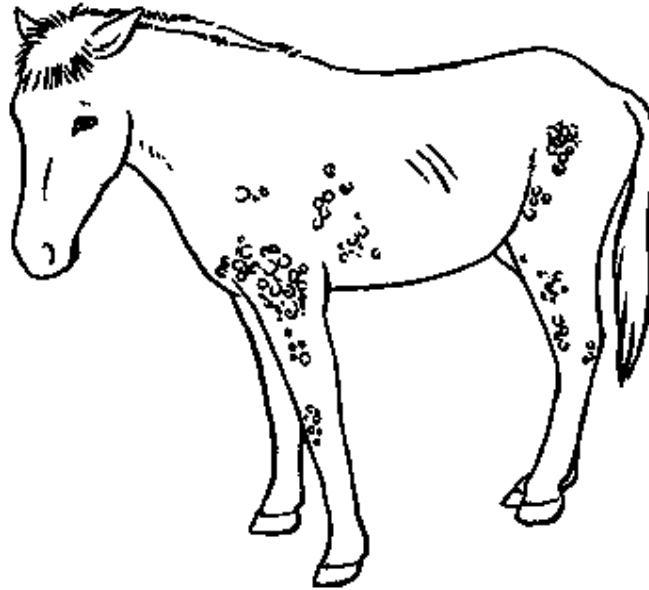
These conditions are difficult to treat and require radical surgery by a veterinarian, as well as antibiotics. The deep cutting out of infected tissue must be done by a veterinary surgeon.

9.20 Epizootic lymphangitis (pseudoglanders)

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This disease is found chiefly in Asia and northern Africa. It affects horses and mules especially when kept crowded together. Donkeys rarely get it.

The infection gets into the body through damage to the skin and can be carried by biting flies.



What epizootic lymphangitis looks like

- **Painful lumps develop under the skin, especially on the legs, but also on the head, neck and shoulders, usually where the tack or harness contacts the skin.**
- **After some weeks, the lumps burst and yellow pus**

drips from them.

- **Lumps may appear on the nostrils, but not up inside the nose (as in glanders).**
- **Between the lumps there are thickened tubes (lymph vessels) under the skin.**
- **The animal becomes thin and loses condition.**

The disease lasts for several months to a year. Animals can recover without treatment, but about 10% of cases die.

How to prevent epizootic lymphangitis

- **Keep affected animals as far away from others as possible.**
- **Euthanase severe cases to reduce the source of infection to others.**
- **Disinfect harnesses and all equipment for grooming, as**

for glanders.

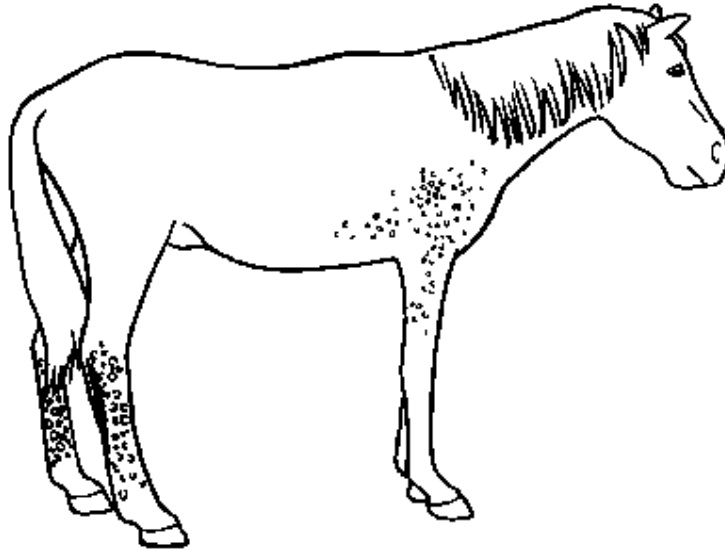
- **Control insects (see the section *Flies*).**

Treatment

There is no effective treatment. Clean abscesses with iodine solution.

9.21 Ulcerative lymphangitis

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This disease occurs in Africa, North and South America, the Middle East and the Indian subcontinent. It mainly affects horses, but can affect donkeys and mules too. The infection starts in skin wounds and is more common when animals have been standing in muddy places.

What ulcerative lymphangitis looks like

- **Swollen legs with bumps that may be in rows.**
- **The bumps burst and creamy pus comes out of them.**
- **The hind legs below the hocks are most commonly affected.**

How to prevent ulcerative lymphangitis

- **Keep infected animals away from other ones.**
- **Disinfect all equipment that comes into contact with the animals as for glanders.**
- **If possible, do not keep animals in muddy places for long periods.**
- **Control insects (see the section *Flies*).**

How to treat ulcerative lymphangitis

- **Wash out the sores and lumps with iodine solution or povidone-iodine solution.**
- **Give antibiotic injections, for example, penicillin or**

sulphonamides.

Severe cases do not always recover.

9.22 Glanders

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This disease is rare, but occurs occasionally in the Middle East and parts of Asia. Glanders affects the skin and the lungs. Donkeys and mules may die within two weeks, but horses are less likely to die from glanders. People can also catch glanders, but human infection is rare.



What glanders looks like

Sometimes it affects the lungs more, sometimes the skin. Some or all of the following signs are seen:

- **fever,**
- **coughing and difficulty breathing,**

- **discharge from the nose, watery at first and later thicker with blood tinges,**
- **lumps, 1 cm wide, appear in the nostrils and break open,**
- **when the lumps heal, there is a star-shaped scar inside the nose,**
- **lumps, 1-2 cm wide, on the skin of the legs or belly,**
- **thickened tubes (lymph vessels), which run between the lumps, can be felt under the skin,**
- **these lumps also burst open and release a sticky, honey-like discharge,**
- **affected legs become swollen and painful.**

If a horse that had glanders is looked at post-mortem, 1 cm wide balls can be seen in its lungs. These balls are either red or yellow inside.

How to prevent glanders

- **Destroy affected animals and bury their bodies.**

- **Disinfect the stables and any buckets, grooming equipment or tack that has been contaminated with discharges from the glanders lumps. Burn any dry bedding.**
- **Vets may test in-contact animals (mallein test) to detect any with early infections. These cases are destroyed to prevent glanders from occurring in the group.**

How to treat glanders

Inject sulphadiazine daily for 20 days.

Do not treat if the aim is to prevent other animals from getting glanders because, when they recover after treatment, they may remain as a source of infection.

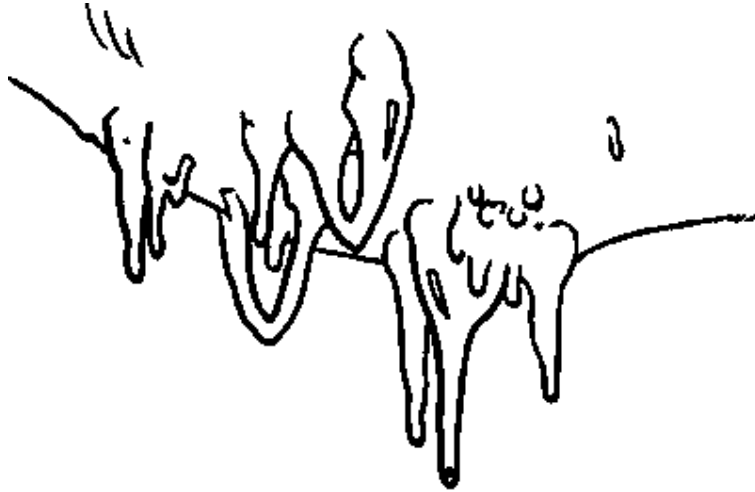
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9.23 Pvythiosis. Florida horse leeches

This disease is found in places with a hot climate, usually humid, coastal areas. These places include parts of South America, the USA and Australia. A fungus of plants that gets into a wound and spreads there causes pythiosis.

What pythiosis looks like

- **A wound that quickly becomes much worse and larger,**
- **very itchy,**
- **thick, bloody liquid drips out and hangs from the wound in strings.**



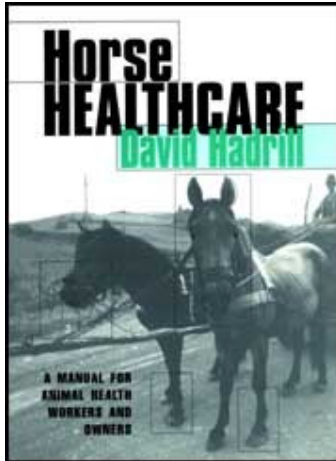
How to treat pythiosis

It is difficult to treat and not all cases recover.

- **Apply iodine solution or povidone-iodine to the**

affected area twice daily for at least a month.

- **A veterinarian should surgically remove the infected tissue.**



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10. Diseases affecting breathing

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10.1 Flu (equine influenza, stable cough)

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Flu, which is caused by viruses, leads to a severe cough. It sometimes spreads through populations of horses and donkeys as an epidemic.



Cough

What flu looks like

- **Usually more than one animal is affected.**
- **First, the animal has a raised temperature for a few days. At this time, there are no special signs, but the**

animal is a bit less alert and less willing to work.

- **Then, a cough begins. The horse coughs frequently as though its throat tickles.**
- **There is a watery discharge from the nostrils. After a few days this becomes thicker and yellowish.**
- **Now the cough becomes more severe. It is a dry, hacking cough that lasts for two or three weeks.**

How flu spreads

- **Infected horses cough out virus particles. Other horses close by breathe the coughed air and easily catch the infection.**
- **People who handle the sick animals also take the infection to other horses.**

How to prevent flu

Vaccines are available against this disease. One injection is given to start vaccination, followed by a second injection six weeks later. Protection lasts for a year. Booster injections can be given every 12-15 months to keep up the protection. Sometimes tetanus vaccine is combined in the same injection.

If the cough has started in a group of horses, do not let uninfected horses come near sick ones until they are better. Anybody who is looking after sick horses should not handle other ones.

At the end of the infection in a group of horses, carefully clean all equipment (including all harnesses, water buckets and food containers, etc.) and leave them in the sun to dry. Any buildings where the horses were tied should be cleaned out and disinfected so that the source of infection does not remain.

How to treat flu

- **Rest the animal. Do not work it while it has a cough or for a week after. If you do, its full recovery will be delayed and it may never fully get better.**
- **Feed soft food that is easily swallowed, for example, bran soaked in water. Tempt the animal to eat with food you know it likes.**
- **House sick animals in a dry, comfortable place without a cold draught.**
- **Put a rug or blanket on the horse if the weather is cool.**
- **Antibiotics are not normally necessary. Injections of penicillin with streptomycin can be given. Do treat with antibiotics if the animal is still coughing after three weeks.**

As with the common cold that people catch, there is no effective treatment for this kind of virus infection. The animal needs to be

kept comfortable and nursed through the infection until it gets better.

In more serious cases antibiotic injections are given so that the virus infection is not made worse by secondary infections with bacteria. Unlike virus infections, bacterial infections can be treated with antibiotics.

10.2 Viral nose infections

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There are some infections that mainly affect the passages through the nose. Infection here causes liquid to run from the nose without much coughing.

Three names for these infections are rhinitis, rhinopneumonitis and equine herpes virus abortion. All three are caused by infectious particles called viruses. The rhinitis virus only infects inside the nose. The herpes virus can also infect a foal developing inside its mother and can cause an abortion.

What these nose infections look like

When the infection starts:

- **fever (up to 41°C for a horse),**
- **the animal behaves in a dull and depressed way,**
- **discharge from the nose is watery at first and then thicker and yellow-white,**
- **sometimes the legs become very swollen during infection.**

From one month after the first infection was seen:

- **foals may be born which are not fully formed,**
- **usually these foals are born dead, but sometimes they survive for a few hours.**

How to prevent these nose infections

- **Keep any animals with a discharge from the nose or a cough separate from others, especially from pregnant mares.**
- **A vaccine is available, but is not always effective.**

How to treat these nose infections

- **Rest and nursing, as for flu (above). Horses should be rested for at least one month.**
- **Antibiotic injections, such as penicillin with streptomycin, should be given against secondary infections.**

10.3 Strangles

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At first this disease looks like flu, but the cough disappears after one or two days and then pus comes from the nostrils and the

lymph glands behind the jaw swell.

What strangles looks like

At first, the horse has:

- **a high temperature,**
- **a watery discharge from the nose and**
- **a cough.**

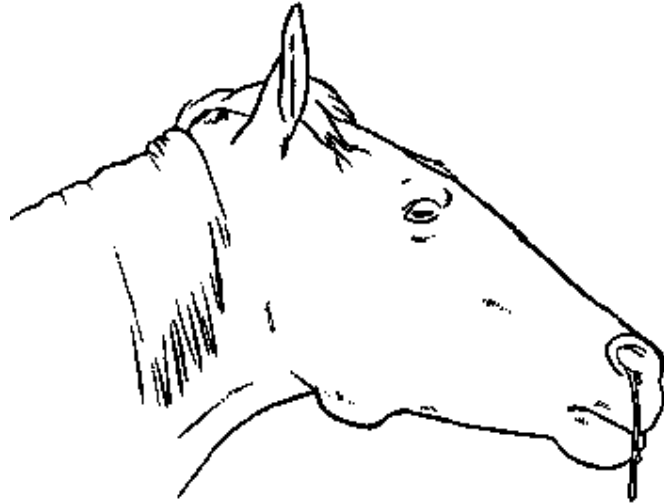
After one or two days:

- **the cough disappears,**
- **swallowing is difficult (because of a sore throat),**
- **thick, creamy, white pus drips from both nostrils.**

Then:

- **lymph nodes around the neck swell, and**

- **they become hot and very painful,**
- **after getting bigger for a few days they form abscesses (see the section *Abscess and how to recognize and treat it*).**



About two weeks after the start of the infection:

- **these abscesses burst and creamy white pus (the same**

as is seen coming out of the nose) drips down the skin,

- **the animal becomes brighter and recovers when the pus starts to come out from the abscesses,**
- **occasionally, at this stage the animal gets a reaction to the infection (see the section *Purpura*).**

How to prevent strangles

If one horse in a group has strangles, it is very difficult to stop it from spreading to others. However, these measures will help prevent other animals from catching it:

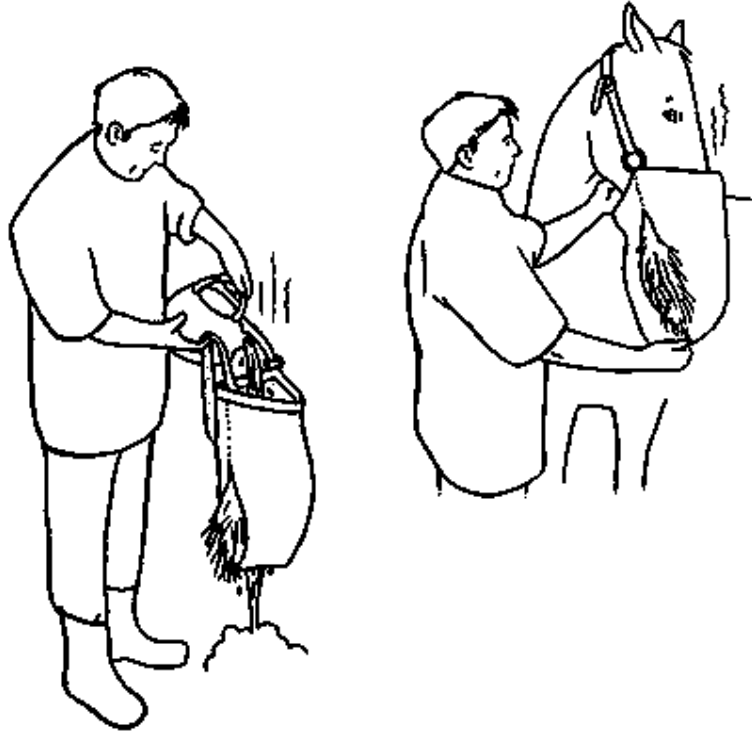
- **If the disease has broken out, take healthy horses away from infected ones. The pus that comes out of the nose or abscesses carries the infection. Make sure you wash it carefully off your hands and clothes before going near another horse.**

- **Every day, scrub all equipment (harnesses, buckets, brushes) with disinfectant and put it in the sun to dry. Remove all bedding on to which pus may have dripped and burn it.**
- **Take the temperatures of all horses nearby twice every day. If you find an animal with a raised temperature, treat it daily with antibiotic (penicillin injection) for three to five days to prevent the disease.**

How to treat strangles

- **Rest.**
- **Nursing as for flu above. Remember the infection causes a sore throat and so the animal should be offered soft, moist food.**
- **'Steaming' helps make the discharge less thick. Do this by pouring boiling water (you can add a few drops of**

eucalyptus oil) on to some hay in the bottom of a feed bag. It is best to use an old feed bag with holes which allow air in. Hold the top of the bag around the horse's head so it breathes in more steam. The animal might panic, so stand with it while the steam bag is on.



- **Antibiotics must be used carefully, if at all. Do not use antibiotics before the infected nodes have burst and pus is seen dripping down the skin. If you inject antibiotic early, it may just partly clear the infection in these**

abscesses. The infection might then linger for much longer and come out later in several places.

10.4 Sinusitis

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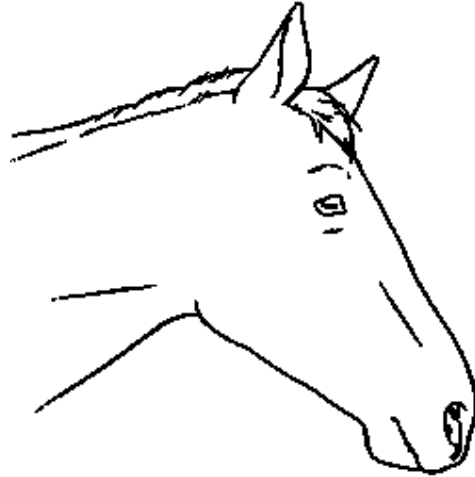
The 'sinuses' are hollow spaces inside bones of the skull. Sometimes infection occurs inside these spaces. This is sinusitis.

The position of hollow sinuses in the bones of a horse's head is shown in the picture.



What sinusitis looks like

Thick mucus, dripping from one or both nostrils is the main sign of sinusitis.



What causes sinusitis

- **The animal has usually had an infection like strangles or flu and then not completely recovered.**
- **Sinusitis can be associated with a cheek tooth from the top row that has become infected or has not grown down properly. If this happens there will normally be a runny nose only on one side, which is the side with the problem tooth.**

How to prevent sinusitis

If an animal has strangles or flu, give proper nursing care and enough rest. Then sinusitis is less likely to follow.

How to treat sinusitis

When a lot of infected pus and mucus has developed inside a sinus, it is difficult for antibiotics given by injection to reach the infection. It is necessary to try to clear the pus and mucus from the sinus, so the treatment should include steaming or trephining, as well as antibiotics.

- When the horse keeps its head down, the sinuses drain better. Therefore, put the animal's feed on the ground or put it out to graze.**
- Steaming is described in the treatment of strangles. It will help make the discharge less thick and help it to drain out of the sinuses.**

- **Antibiotic injections. Because it is difficult to get the antibiotic to where the infection is, it is usually necessary to give a long course of injections, for example, daily for two weeks. Use broad-spectrum antibiotic such as penicillin with streptomycin.**
- **It is important to rest the animal and keep it in a comfortable place until it has recovered. Turn it out to graze.**
- **Trephining, which only a veterinarian can do. It involves drilling a hole through the side of the head, usually just below the eye, so that the sinuses can be washed out with an appropriate solution.**



- **Remove the problem cheek tooth. (This is also a job that can only be done by a veterinarian with expertise in**

equine dentistry. The technique requires a general anaesthetic and removal of the tooth through a flap opened in the bone on the side of the face.)

10.5 Lung worms

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Worms in the breathing tubes can cause coughing that lasts for several months. Lung worms often infect donkeys, but donkeys, unlike horses, often do not become ill.

What lung worm disease looks like

- **Coughing, sometimes quite violent.**
- **The disease can go on for months.**
- **After each bout of coughing, the lips are wet with saliva.**
- **In countries with a cold winter, the disease occurs in**

the summer or autumn and most horses recover by winter.

- **Treatment and recovery after giving worm medicine confirms that lung worm was the cause of coughing.**

How to prevent lung worm

- **Where lung worm is a problem, avoid keeping horses with donkeys.**
- **If horses are kept with donkeys, treat the donkeys for worms. In places where there is a cold winter, do this in the spring just before the ground warms up, because, in warmer conditions, the infective larvae develop on the grass and infect other animals.**
- **Treat animals regularly for worms.**

How to treat lung worm

Use a drug for deworming, for example:

- **ivermectin, dose 0.2 mg (200 µg) per kg body weight, or**
- **fenbendazole (Panacur), dose 15 mg per kg body weight, or**
- **thiabendazole (Thibenzole), dose 440 mg per kg body weight and repeat after two days.**

10.6 Chronic pulmonary disease (CPD), broken wind, heaves

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This disease is also called COPD or chronic obstructive pulmonary disease. It occurs where horses are housed and fed hay. The disease does not spread from horse to horse. It is caused by an allergy to mould or dust. This disease may develop after an infection such as flu.

What CPD looks like

- **The horse is kept in a house with dry hay or straw around.**
- **It is bright and well in itself and has a normal temperature.**
- **Its breathing is faster than normal (often more than 20 breaths per minute for an adult horse).**
- **The horse makes more effort than normal to breathe out.**
- **Occasionally there is mild coughing (so the disease can look like lung worm disease) especially when the horse starts to trot.**
- **The disease can continue for months.**
- **There may be a discharge from the nose.**

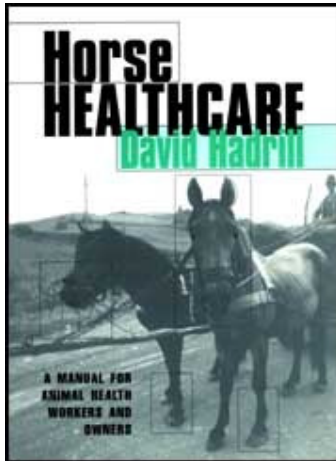
How to prevent CPD

Most horses will never get this disease, which is an allergic reaction to dry, dusty hay that affects some individual animals. For an individual that does get CPD, follow the advice on treatment, below.

How to treat CPD

- **Prevent access to dusty hay.**
- **Keep the horse outside under shelter, but not in a closed box.**
- **Before taking it to the horse, soak hay in water by putting a net of hay in a tank or large bucket.**
- **Feed something else if possible, but, if hay is given, only feed the best, new hay.**

- **Store hay away from where the horse lives.**
- **Do not use straw for bedding. Use wood sawdust or shredded newspaper or earth.**



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11. Other important infections

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11.1 Tetanus or 'lock-jaw'

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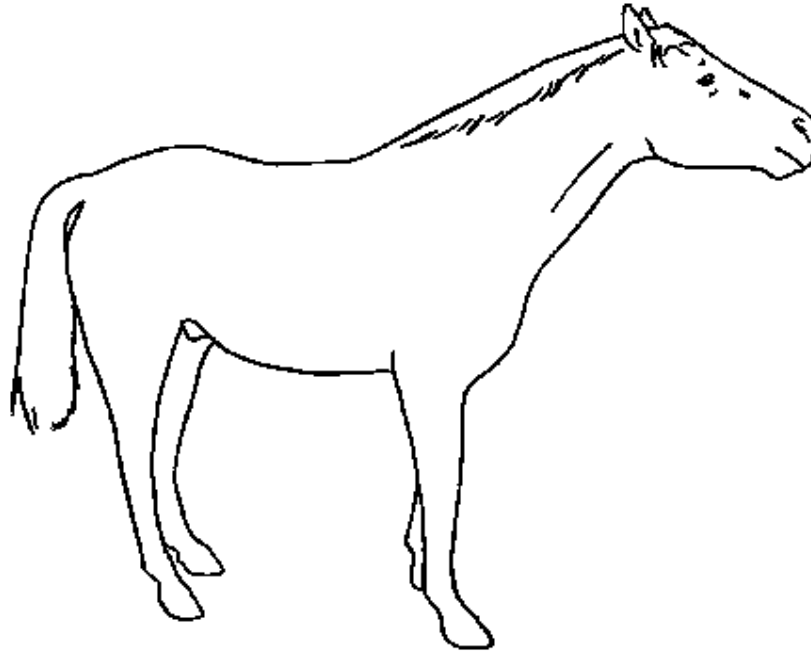
Tetanus follows infection of a wound. The wound may have been small, such as a puncture wound from a nail, and may not have been noticed. Signs of tetanus may not be seen until some weeks after the wound. Tetanus causes muscle contractions (stiffness) and often results in death.



What tetanus looks like

- **The horse has a frightened expression.**
- **Eyes are slit-like, the third eyelid stays partly across the eye (it is normally only just visible at the inside corner of the eye).**

- **The pupils, the black part in the centre of the eye, stay wide open in bright light.**
- **The ears stick up and are stiff.**
- **As tetanus develops, the horse becomes stiffen It stands with its legs spread out.**



The horse with tetanus stands stiffly.

- **The jaw cannot open, it cannot chew and strands of saliva may hang from the mouth.**
- **Quivering contractions of its muscles happen after**

stimulation, such as sudden noise or bright light.

- **The temperature is usually normal.**
- **The horse stands for as long as it can. When it collapses with exhaustion, it soon dies. Most cases die in three to ten days. Donkeys have better survival rates than horses.**

How to prevent tetanus

Tetanus is prevented by vaccination with tetanus toxoid. Two injections three to four weeks apart are normally required to protect an adult horse. For vaccinating foals, follow the manufacturer's instructions.

Immunity may be long, although vaccine manufacturers may recommend boosting the vaccination every two years. Vaccination even once in an animal's life greatly reduces the risk of it ever getting tetanus.

If an unvaccinated horse has a wound, temporary prevention can be provided by an injection of tetanus antitoxin.

How to treat tetanus

Treatment is rarely successful in horses. Many donkeys and some horses recover if kept quiet and given good nursing care.

- **Put the horse in a quiet, dimly lit stable.**
- **Hand-feed soft, easily swallowed feed, such as bran mash and fresh green leaves.**
- **Sedate the horse. Give injections of acetylpromazine, up to 0.1 mg/kg body weight every four to six hours according to effect.**
- **Inject penicillin.**
- **Give a large dose of tetanus antitoxin.**

Prevention, by vaccination, is much more effective than treatment for tetanus.

11.2 Rabies

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In most parts of the world rabies is not a common disease of horses or donkeys. It causes unusual behaviour and then, in most cases, death in three to ten days. It is a dangerous disease, and fatal to people who get it.

If you are bitten by a horse you suspect has rabies, or if its saliva contacts even a small wound on your skin, scrub your wound with soap for five minutes *as soon as you can*. Ask a doctor for advice about whether you need more treatment.

How animals get rabies

The disease is caught from the bite of an infected animal, usually a dog. It is sometimes caught from a wild animal such

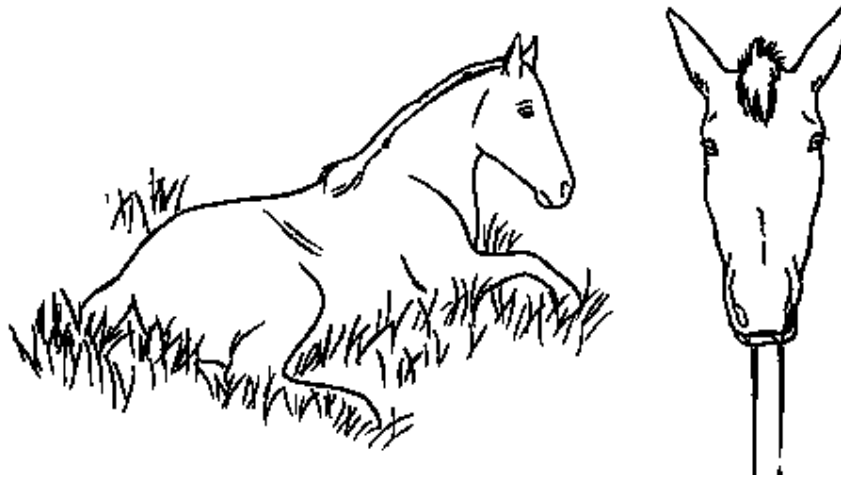
as a fox. In Latin America, it is also spread by vampire bats.

What rabies looks like

The signs do not appear until at least two weeks and up to several months after the bite from the infected animal.

Signs vary. These signs of rabies infection may be seen:

- **grinding the teeth and whinnying, or**
- **a 'dumb' form when the animal stops eating, appears depressed, or**
- **a 'furious' form when the animal becomes excited and manic, or**
- **the horse may become paralysed and be unable to stand.**



Chewed food may come down the animal's nose and saliva may drool from its mouth.

How to prevent rabies

A vaccine is available, but is normally used only on animals in high-risk areas.

How to treat rabies

Treatment is not effective. Euthanasia is recommended. Take

care not to be bitten.

If a horse has been bitten by an animal known or suspected to have rabies, a series of injections of rabies vaccine can stop the disease occurring. After the bite, vaccine is injected on day 0, day 3, day 7, day 14, day 28 and day 30.

11.3 Anthrax

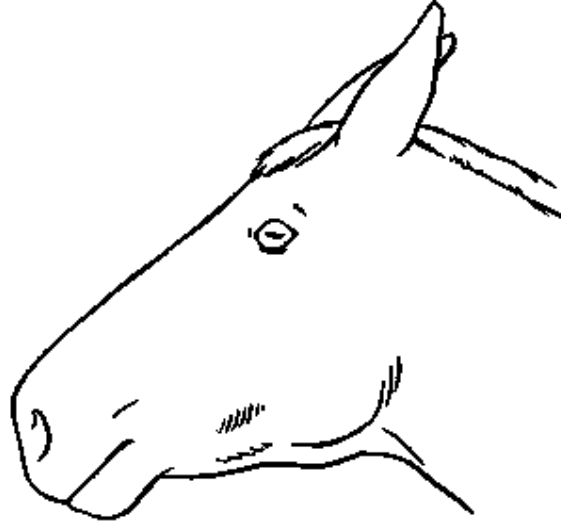
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Anthrax is an infection of the blood. Other species, such as cattle, usually die quickly after the signs of anthrax appear. Horses and donkeys may be ill for a long time and do not always die.

What anthrax looks like

- **A high temperature (up to 106°F or 41°C) at first.**
- **A rapid pulse (80-90 for an adult horse) and rapid breathing.**

- **Colic signs, such as kicking at the belly.**
- **Large swellings, especially around the neck.**



Anthrax causes swelling under the jaw and around the neck.



- **The diagnosis of anthrax is confirmed by using a microscope to examine a blood smear. See the section *How to collect samples for laboratory tests.***

How to prevent anthrax

Anthrax can be prevented by vaccination. In areas where anthrax is common, an injection is given once a year.

The anthrax-causing germ lives for many years in the soil. Animals can get the disease when they eat a bit of contaminated soil with grass. An animal that has died of anthrax can be a source of infection for many years. It is possible to reduce the contamination of the soil with the germs from an animal that has died of anthrax:

- **Stop vultures, dogs, etc. from opening the body. Put thorn bushes over the body or guard it for a few days. In hot countries, the germs will die inside the body of the animal in a few days. If the blood of an anthrax case is**

not allowed to contact the air, the germs in the blood cannot turn into spores, the form that stays on in the soil.

- **The alternative is to bury it deeply, about 2 metres deep, and cover it with lime.**

How to treat anthrax

Give injections of antibiotics such as penicillin.

11.4 Tuberculosis

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There are three types of tuberculosis: the human type, the bovine (cattle) type and the avian (bird) type. Horses do sometimes get the avian or bovine form. However, the disease is not as common in horses and donkeys as in some other species.

What tuberculosis looks like

The signs are not unique to this disease. For example, some of these may be seen:

- **weight loss,**
- **diarrhoea for a long time,**
- **coughing, or**
- **stiff neck.**

If an animal with tuberculosis is examined post-mortem, abscesses in a thick shell may be seen in the liver, spleen or lymph nodes near the intestine. There may be many small abscesses or one or more large ones. There are sometimes abscesses in the bones or lungs.

There is no effective treatment.

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11.5 Malignant oedema

Malignant oedema is a gangrenous infection of wounds that usually results in death.

What malignant oedema looks like

- **Swelling of the wound, with gas bubbles.**
- **Very dull animal, with a rapid pulse.**
- **Later the animal becomes colder, shivery and dies.**

How to prevent malignant oedema

Keep wounds clean. If castrating a horse, perform the operation on clean ground or grass.

How to treat malignant oedema

Treatment is rarely effective, but try giving large doses of penicillin. Wash the wound with antiseptic. See the section

Infected wounds.

11.6 Babesiosis, piroplasmosis

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***Babesia* spp. are microscopic parasites that live inside red blood cells and then destroy them. *Babesia* get into the horse or donkey's body when ticks on its skin are feeding on its blood. The disease is found in many tropical and subtropical parts of the world, including southern Europe, Florida, Latin America, the Caribbean and Asia.**



Tick magnified. Some ticks carry babesiosis.

What babesiosis looks like

- **Fever,**
- **the animal is unwilling to move around and stops eating,**
- **yellow mucous membranes (jaundice),**
- **small blood spots under the skin of mucous membranes,**
- **red urine,**
- **oedema swelling of the face and body.**



Diagnosis is confirmed in the laboratory by seeing the parasites inside red blood cells (see the section *Blood smear*).

The animal may die just one or two days after the first signs are seen.

Infection without disease

Animals growing up where there are ticks and where the infection is widespread do not normally get ill from the disease. They become infected as foals and acquire a type of immunity.

Animals that never met the disease as foals are at great risk if brought, as an adult, to an area with ticks and babesiosis. Animals that do have some immunity can get the disease if they are stressed, for example, by over-work.

How to prevent babesiosis

There is no vaccine, but making sure foals less than six months old graze with other animals on pasture with ticks should mean that they get infected at an age when they will not get serious disease. Should they get the signs described above, treat them.

How to treat babesiosis

Intramuscular injections of imidocarb (Imizol). See list of *Medicines for treating infections* at the back of the book for the dose.

11.7 Viral encephalomyelitis diseases

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Members of a group of similar diseases are each caused by a different virus. These viruses can infect humans too.

Where viral encephalomyelitis diseases occur

<i>Disease name</i>	<i>Where it occurs</i>
Eastern equine encephalomyelitis (EEE)	Eastern USA
Western equine encephalomyelitis (WEE)	Western USA, Canada

Venezuelan equine encephalomyelitis (VEE)	Latin America
Japanese equine encephalomyelitis (JEE)	Asia (from India to the Far East)
West Nile encephalomyelitis (WNE)	Africa, western Asia and southern Europe (e.g. Carmargue)

Viruses living in birds, reptiles or rodents cause these diseases. Infection of horses and donkeys (or humans) can follow a bite from a mosquito that has already fed on one of the wildlife species having the virus.



Mosquitos carry encephalomyelitis viruses

What viral encephalomyelitis looks like

Some of the following signs are seen:

- **fever up to 41°C (106°F),**
- **stops eating,**
- **various changed behaviours such as aggression, excitability, sleepiness, itchiness,**
- **pressing its head against a wall, walking around in circles, avoiding light,**
- **blindness,**
- **fits may occur.**

Even for the same disease, the signs vary. Some animals get a severe form and die, but others get a mild form with fever and loss of appetite and recover. Around 50% of cases die. Surviving animals slowly recover over several weeks, but some have permanent brain damage or blindness.

How to prevent viral encephalomyelitis

Vaccines are available against EEE, WEE, VEE and are used in the USA. In Japan, horses (and people) are regularly vaccinated against JEE. There is no vaccine against WNE.

How to treat viral encephalomyelitis

As with any virus infection there is no specific treatment.

If the animal shows signs of changed behaviour:

- **inject dexamethasone intramuscularly every six hours for two days, dose 0.05-0.1 mg per kg body weight, or**
- **inject flunixin meglumine intramuscularly every 12 hours, dose 0.5 mg per kg body weight.**

If the animal has fits, keep it on soft ground to reduce injury. It can be treated initially with:

- diazepam (Vallium),
 - foal of 50 kg weight: 5-20 mg intravenously
 - adult horse 400 kg weight: 20-80 mg intravenously;
- or xylazine (Rompun).

- foal of 50 kg weight: 25-50 mg intravenously
- adult horse 400 kg weight: 250-400 mg intravenously.

11.8 Equine viral arteritis

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The infection may occur worldwide, but many infections do not make the horse ill and are not noticed. Adult animals do not usually die from it, but young foals do.



What EVA looks like

In some places the infection can cause the signs listed below and lead to death. In other places, infection may cause only mild illness that is hardly noticed.

- **Fever up to 41°C (106°F),**
- **dull behaviour and stops eating,**

- **swelling (oedema) under the skin of the eyelids,**
- **blood-stained tears,**
- **swelling of the legs and belly,**
- **similar swellings may occur on the sides of the face and neck,**
- **discharge from the eyes and nose,**
- **pregnant mares may abort,**
- **sometimes a cough.**

The disease can look similar to other conditions resulting in swellings on the body. Mild forms of EVA can look like infections that affect breathing, such as flu (see the section *Flu*), and so the signs do not easily identify it.

How to prevent EVA

In an outbreak, if possible avoid contact between sick and healthy horses.



Confirmation of EVA is a job for specialized laboratories, which may find the virus in samples or may test blood samples for evidence of EVA. Where advanced laboratory facilities exist, infected animals are identified from samples taken and the positive animals are kept separate from others for at least one month.

A vaccine is available and is sometimes used in breeding animals in areas where EVA is a problem. Permission from the veterinary authorities may be required to use the vaccine.

How to treat EVA

There is no treatment effective against this disease, but inject antibiotics to protect against additional infections.

11.9 African horse sickness

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Midge

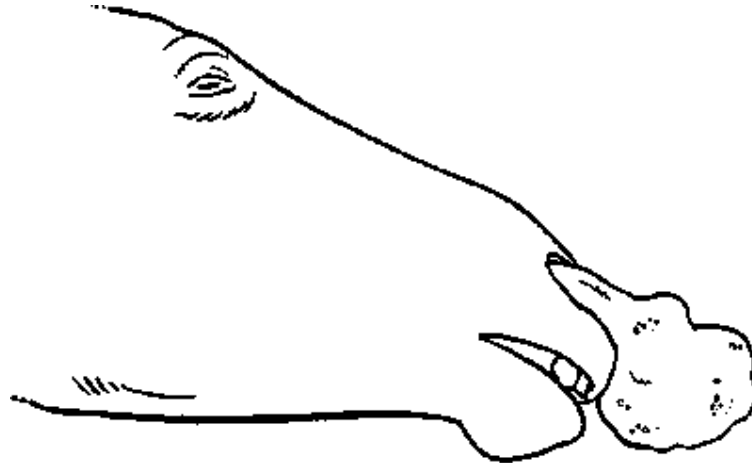
This disease occurs in sub-Saharan Africa and has spread to Spain, Portugal, the Arab peninsular and the Indian subcontinent. Biting insects such as midges transmit it. It is believed that midges pick up the infection from zebras. The disease is seasonal. Big outbreaks can follow heavy rain, which favours the insects' reproduction.

What African horse sickness looks like

Different forms, which vary in severity, are seen. In Africa, local donkeys and horses can be affected so mildly that the infection is not noticed. However, mules and imported horses can get a severe infection and die. In all forms, there is a fever of 40°-

41°C (105°-106°F).

The signs of the different forms of African horse sickness are as follows.



SEVEREST FORM

- **Difficult breathing and coughing,**
- **the animal continues to eat,**
- **yellowish fluid and froth from the nose,**
- **sweating,**

- **the horse lies down,**
- **death four or five days after the first signs.**



MILDER FORM

- **Swelling (oedema) around the eyes and bulging of the inside of the eyelid,**
- **swollen lips,**

- **blood spots below the skin under the tongue,**
- **difficulty in swallowing,**
- **death does not always follow, but if the animal does die it happens up to two weeks after the first signs.**

MIXED FORM

A mixture of the severest and milder forms can occur.

How to prevent African horse sickness

Vaccinate horses, donkeys or mules before they are transported to an affected area.

How to treat African horse sickness

- **There is no treatment. Nursing care is all that can be provided in the hope that the horse will recover.**

- **Antibiotic injections, for example, penicillin with streptomycin, are given to protect against secondary infections.**

11.10 Equine infectious anaemia, swamp fever

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This disease has been found in North and South America, Africa, Europe, Asia and Australia. Biting insects such as horse flies spread it.



Tabanus

What equine infectious anaemia looks like

- **Temperature of 38.5°-40.5°C (101.3°-105°F).**
- **The animal goes off its food.**
- **Pregnant mares may abort.**

Most animals recover after this stage. Often, owners do not notice that the horse has been ill. Some animals do not show any more signs, but others may show the following signs after two to three weeks:

- **fever,**
- **weight loss,**
- **dull behaviour,**
- **small blood spots under the skin of mucous membranes,**
- **difficulty in walking,**
- **jaundice,**

- **swelling (oedema) of the lower belly,**
- **rapid pulse,**
- **weakness.**

Most cases that show these signs die within one year. Up to that time:

- **they become weaker,**
- **they periodically get a fever with blood spots again showing on the mucous membranes,**
- **towards the end the colour of the mucous membranes becomes pale.**

How to prevent equine infectious anaemia

Biting insects, such as horse flies, spread it. Keep ill animals as far away as possible from others to reduce the chance of insects carrying the infection between them.

Vets may take a blood sample for a special test, called the Coggins test, to find out if an animal has had the illness.

Using the same surgical instruments or hypodermic needles without sterilizing them can spread the disease. Cases that have recovered from the disease look normal, but have the virus in their blood. Therefore, it is very important to sterilize instruments properly. See the section *How to sterilize equipment*.

Treatment

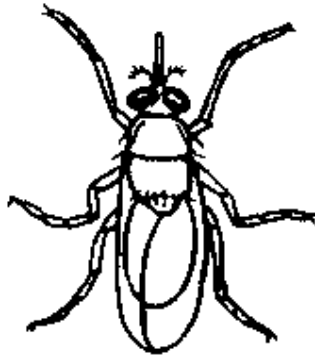
There is no effective treatment.

11.11 Nagana, African trypanosomiasis

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This disease is caused by a microscopic *Trypanosoma* spp. parasite, which gets into the blood from an insect bite. In Africa, the tsetse fly is the insect that normally transmits it.

Therefore, the disease is mainly found where tsetse flies live.



Tsetse fly

What African trypanosomiasis looks like

It is usually a slow disease with variable signs. The signs of trypanosomiasis may include:

- **a fever that comes and goes,**
- **dull behaviour,**
- **the animal becomes tired easily and may stop eating,**

- **a discharge from the eye,**
- **swollen lymph nodes,**
- **pale mucous membranes (see the section *How to check mucous membranes*),**
- **becomes thinner and weaker over a period of weeks,**
- **swollen limbs and belly with oedema (see the chapter *Lumps under the skin* for how to recognize oedema),**
- **there may be signs that the brain is infected, for example, pressing the head against a wall, walking round in circles or paralysis.**

The animal usually dies after two to four months.



Usually the disease is identified when the small parasites are found in a blood sample, using a microscope. See the section *How to collect samples for laboratory tests* for how to make a sample of blood ready for microscopic examination. It is more likely that parasites will be found if the blood sample is taken when the animal has a fever. Later in the disease, fewer trypanosomes can be found in the blood.

How to prevent African trypanosomiasis

Control of the African tsetse fly is a major undertaking. It is normally carried out to make it possible to keep cattle on land that cannot otherwise be grazed by cattle because of this disease. There have been large-scale programmes, such as insecticidal sprays from aircraft, and local initiatives, such as insect traps.

The other approach to control is to inject the animals regularly with a drug that kills trypanosomes. This is usually done for cattle, not horses and donkeys. There is no vaccine.

How to treat African trypanosomiasis

Inject one of the following drugs according to the manufacturer's instructions:

- **homidium bromide (Ethidium), dose 1 mg per kg body weight,**
- **quinapyramine sulphate (Antrycide), dose 5 mg per kg body weight.**

Diminazene aceturate (Berenil) is not recommended for horses, so do not give it if alternative drugs are available. If there is no alternative, a suggested dose for Berenil is given for the disease dourine (see below).

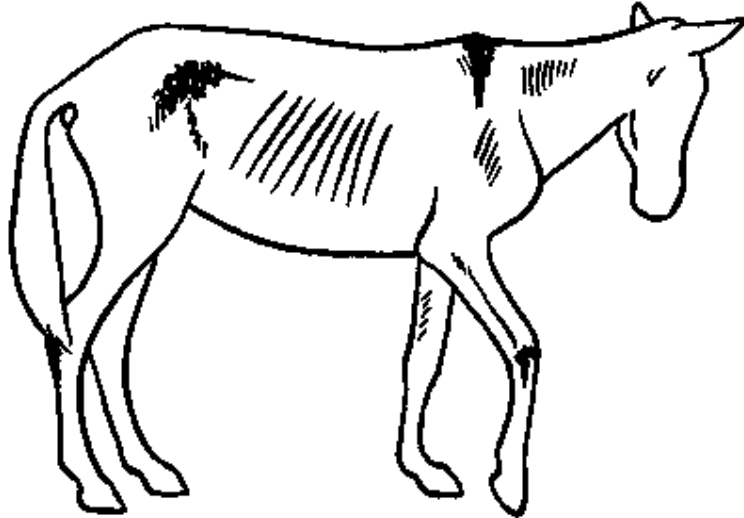
11.12 Surra

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This is also a trypanosomiasis disease, but biting flies other than tsetse flies transmit the parasite that causes surra. It occurs in places where there are no tsetse flies, including North Africa, India, Southeast Asia, the Middle East and Latin America.



Stomoxys



What surra looks like

- **Wasting,**
- **fever that comes and goes,**
- **pale mucous membranes,**
- **oedema swellings of legs and belly,**

- **thinness,**
- **discharge from the eyes,**
- **there may be small blood spots on the pink skin (conjunctiva) inside the eyelids,**
- **in the later stages, the brain is affected. Then there may be fits or the animal may be weak on its hind legs and unable to walk properly.**

Without treatment, surra always leads to death. This can happen after just a few days or after several months.

How to prevent surra

It is impossible to avoid bites from flies. There is no vaccine. Early identification and treatment is necessary. However, the risk of infection from the bite of a carrier fly can be reduced by using fly repellents (see the section *Flies*), and by treating

wounds promptly.

How to treat surra

Some of the drugs that may be used to treat surra are given below.

QUINAPYRAMINE SULPHATE

Give a subcutaneous injection of quinapyramine sulphate (Antrycide), dose 3mg per kg body weight. This can be toxic, so work out the total dose and give half in a first injection and the other half in a second injection six hours later.

ISOMETAMIDIUM CHLORIDE

Different manufacturers call this drug Trypamidium or Samorin. It is usually sold in a 1 g sachet.

To prepare a 2% solution, mix a 1 g sachet in 50 ml of boiled and cooled water.

Dose of isometamidium

A 2% solution is 2 g of medicine in 100 ml water, which is 20 mg medicine in one ml of solution.

The dose is 0.5 mg of isometamidium per kg body weight.

Therefore, one ml of solution is for 40 kg body weight.

For a 100 kg animal, 2.5 ml of solution is needed.

For a 400 kg horse, 10 ml of solution is needed.

Give as an intramuscular injection. Split the dose and inject in several places and rub after injection.

DIMINAZENE ACETURATE

This drug is sold as Berenil. It is used, but it can be toxic to horses. Follow the manufacturer's instructions.

It is given by intramuscular injection. First give a dose of 7 mg per kg body weight, then give another injection of half this dose 24 hours later.

11.13 Dourine

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The trypanosome that causes this disease is transmitted when horses or donkeys mate. The disease may occur in South America, Africa (particularly northern and southern Africa) and parts of Asia.

What dourine looks like

- **Oedema (for how to identify oedema, see the chapter *Lumps under the skin*) of the skin around the penis or the lips of the vulva, which means the lips under the tail of the mare.**
- **Discharge from the penis or from the vagina of mares.**

- **The swelling spreads to the belly and enlarges.**
- **Oedema swellings appear on the sides of the body.**
- **Later on, thinness and weakness progress.**
- **Weakness on both hind legs.**

About half of the animals with this disease die from it.

How to prevent dourine

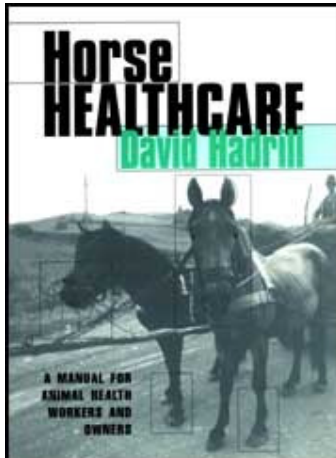
Where the disease is established, mares may be treated with Berenil at the time of mating. A laboratory test on a serum sample can be used to identify infected animals.

How to treat dourine

This is never completely effective in all cases. Some animals recover, but remain as a source of infection to others. It is not recommended to treat dourine. Euthanasia is recommended.

Two drugs could be used to treat dourine, but both can be toxic:

- **quinapyramine sulphate (Antrycide), which is used as for surra.**
- **diminazine (Berenil), see surra treatment for dose.**



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12. Colic, pain in the belly

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Colic means pain in the digestive tract, that is, the stomach or intestines.

What colic looks like

- **Restlessness,**
- **pawing the ground,**
- **kicking its belly,**
- **sweating.**

Note that other events can cause these signs, for example, giving birth.

12.1 How to decide if the colic is likely to be serious

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Diagnosis is complex and best left to a veterinarian if one is available.



Colic may be mild or serious. Without professional advice, it is sometimes possible to decide if the colic is likely to be serious by checking the pulse rate, the colour inside the eyelid and the breathing.

Pulse rate

The animal's pulse rate is a useful guide to how serious the colic is. See the chapter *How to check signs of a horse or donkey's health* for normal pulse rates and how to take the pulse. If the number of heart beats per minute is near normal, usually the colic is not serious.

Pulse rate and severity of colic

<i>Pulse rate of the horse</i>	<i>Seriousness of colic</i>
50 beats per minute or less	Not a serious colic
50-60	This is a sign of pain, but not too worrvina

60-80	This is a worrying pulse rate, especially if it stays high after the horse is given a pain-killing drug
More than 80	Very serious; the horse may die or may need to be euthanased

Colour inside eyelid

The colour of the skin inside the eyelid is normally pink. It is a poor sign when the inside of the eyelid is a dull red colour ('brick red'), or yellowish with little blood vessels clearly showing. If it looks purple, death is usually close.

Breathing

It is more likely to be serious colic if:

- **the breathing is much faster than normal,**
- **the nostrils are wide open,**
- **the breathing sounds like sighing.**

12.2 Causes, prevention and general care of colic

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Some of the more common causes

FOOD

- **Sudden change to what the horse eats,**
- **too much food, for example, if a horse eats too much grain from a sack,**
- **poor quality food, such as mouldy hay, or too much dry straw,**
- **long gaps between meals,**
- **fresh, highly fermentable green fodder that produces gas.**

WATER

- **Not enough clean drinking water,**
- **water not supplied regularly,**

- **rapid drinking of too much water.**

INTERNAL PARASITES

- **Red-worms have a developing stage that damages blood vessels to the gut.**
- **Bot larvae in excessive numbers may sometimes cause colic.**

BAD TEETH

For example, if the back teeth have sharp edges the horse may not chew its food properly.

SAND

The animal may swallow sand if it is grazing on sandy ground where there is not much grass.

EATING STRANGE THINGS

For example, horses and donkeys sometimes eat plastic bags, or pieces of rope.

Prevention of colic

- **Feed small quantities of good quality food at regular intervals.**
- **Do not prevent the horse from eating for a long period, and then let it eat a lot.**
- **Keep sacks of grain in a place where the horse cannot get to them.**
- **Make sure water is offered frequently during the day. Little and often is best, especially in hot climates.**
- **Remember that, if an animal does not have any food or water for a long time, it may over-eat or drink too much**

and then get a digestive problem.

- **Advice on how to prevent internal parasites is given in the section on parasites.**
- **Make sure teeth are rasped regularly.**

General care

- **Try to get professional help from a vet if possible.**
- **Remove food until the colicky pain has stopped. Keep the animal somewhere without food and without bedding material it could eat. The first meal after recovery should be a small bran mash and a small amount of fresh green fodder.**
- **Give treatment for worms.**
- **Listen to the noises in the guts by pressing your ear**

against the horse's belly. Give appropriate treatment according to the signs of what kind of colic it is.

Signs of colic and appropriate treatment		
Guts very noisy <i>and pulse rate less than 60 beats per minute</i>	→	<i>Give treatment for spasmodic colic (colic with gut muscle cramps)</i>
Very quiet guts or no sounds	→	<i>Give treatment for colic because of blockage with impacted food</i>
Gassy 'ping' sounds	→	<i>Give treatment for colic with a lot of gas</i>

12.3 Colic with gut muscle cramps, spasmodic colic

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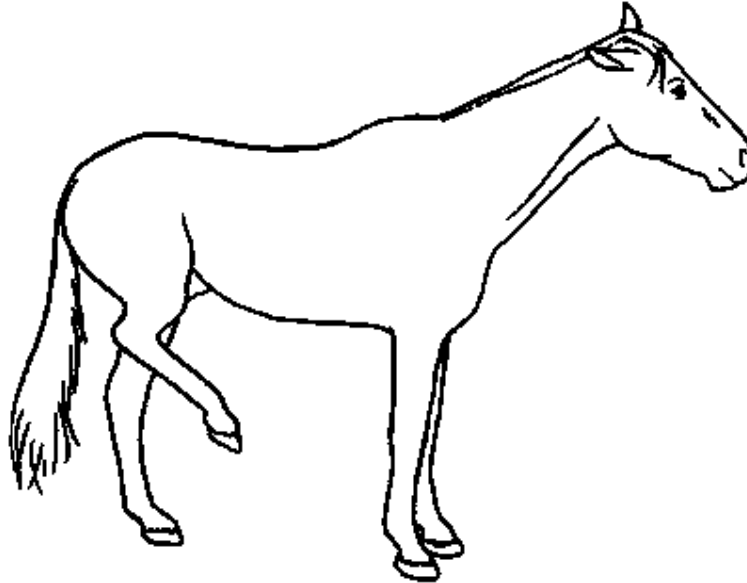
What spasmodic colic looks like

The animal shows signs of pain that stop and start. These signs

may be:

- **rolling,**
- **sweating,**
- **kicking at the belly or stamping,**

The pulse rate may go up to 50 beats per minute, but when the gut pain stops it goes back to normal after a few minutes.



Kicking belly

How to treat spasmodic colic

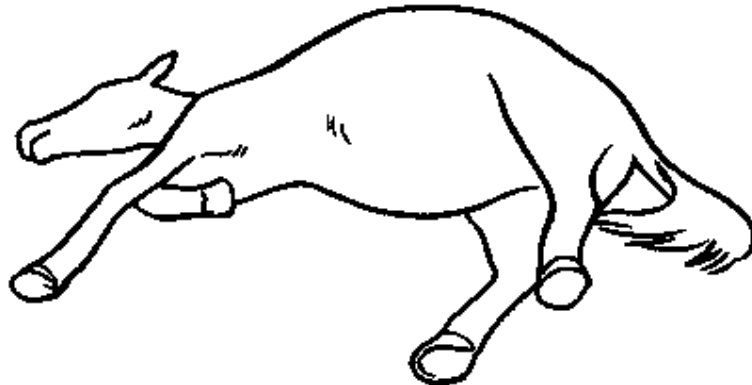
Give an injection to relieve pain. For example, give hyoscine with dipyron (Buscopan) by intravenous injection (if given by injection into the muscle, this drug may cause an abscess), or flunixin meglumine (Finadyne). See the *List of medicines* at the

back of the book for doses. These cases usually respond well to treatment for pain.

12.4 Colic with a lot of gas

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This type of colic can follow eating a lot of fresh green food.



What gas colic looks like

- **The belly is usually swollen with gas and there are**

sounds of gas gurgling and rumbling inside.

- **The pain may stop and start.**
- **The pulse does not usually rise above about 50.**

How to treat gas colic

- **Give phenylbutazone by intravenous injection.**
- **Alternatively, give 1.1 mg per kg body weight flunixin meglamine (Finadyne) by intravenous or intramuscular injection.**

These cases usually respond well to treatment for pain. These drugs reduce the pain, but do not stop the contractions of the gut muscles, which help the animal to get rid of the gas.

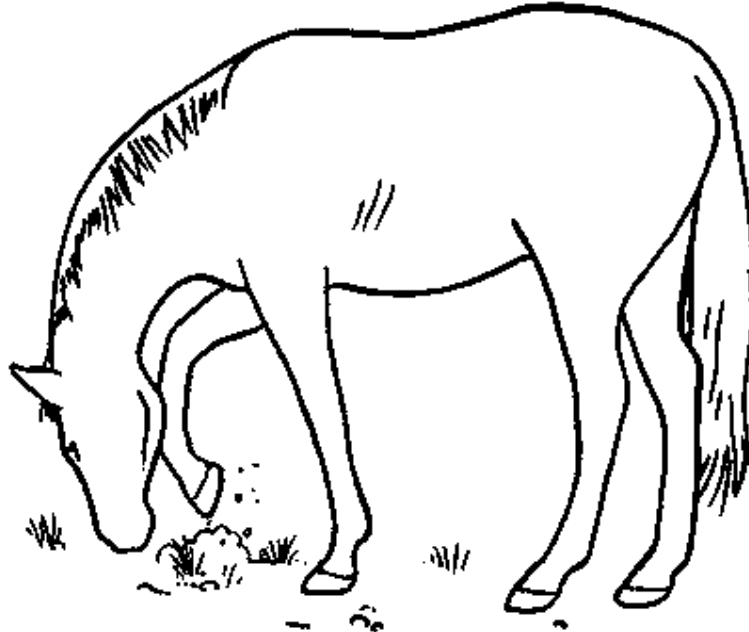
12.5 Colic because of blockage with impacted food

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This kind of colic can occur after the animal has eaten a diet with a lot of dry straw. The food being digested can become stuck in a hard, dry mass in the latter parts of the guts, which are called the colon and caecum.

What impaction colic looks like

- **The animal is not usually in as much pain as with colic with a lot of gas, but pain may become stronger over a few days.**
- **The horse may strain as though it wants to pass urine, holding its tail high.**
- **It may look round at its belly, scrape the ground with a front foot, or yawn.**
- **There are no loud noises of gas in the belly.**



Pawing the ground

How to treat impaction colic

Give liquid paraffin by stomach tube. Liquid paraffin is a clear, oily fluid available from pharmacies and is *not* the same as paraffin for cooking stoves.

Give 2-4 litres of liquid paraffin (2 litres for a donkey or small pony, 4 litres for a large horse) twice a day for three days. Give the same amount of salt solution (7 g of salt per litre of water) at the same time.

It is best to give the fluid by stomach tube (see the section *How to use a stomach tube*). Alternatively, pour it into the corner of the animal's mouth using a funnel, but be sure to allow the animal plenty of time to swallow so that it does not choke.

12.6 Sand colic

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This is a particular type of blockage of the intestines. It occurs in horses in desert environments where there is sandy ground and not much grass.

What sand colic looks like

- **It is very painful. The horse may show signs of great**

pain, such as kicking its belly, rolling, sweating, and may have an anxious expression in its eye.

- **Put a lump of the animal's dung in a jar of water, and mix it. In cases of sand colic, sand is likely to settle at the bottom of the jar.**



Treatment is difficult. Surgery may be necessary, a job for an experienced veterinarian.

12.7 Colic with a twist in the gut

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If the gut has twisted, pain is very strong. The horse will roll. Its pulse will be high and it will probably show other signs of serious colic.



These cases can usually only be cured by surgery carried out by an experienced vet. Even with an operation, not all survive.

If a horse had great pain but continues to have a very high pulse after giving injections to relieve pain, its chances of

surviving are poor. Following a twist in the gut, the blood supply to part of the gut is stopped, and that part of the gut dies. Then gut contents leak out inside the horse. After the strong pain stops, the horse may start sweating, or just stand and shiver. This is a poor sign.

Other poor signs are:

- **The pulse rate is above 80 beats per minute.**
- **There are more than 40 breaths per minute.**
- **The skin under the eyelids looks purple or black.**
- **Foul-smelling fluid may come down the nose.**
- **The body temperature is low (for example, 36°C).**

When you see these poor signs, the kindest action may be euthanasia. See the chapter *How to shoot a horse*.

12.8 Food stuck in the neck, choke

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Sometimes dry food, for example, some pelleted food, swells with the animal's saliva and gets stuck after being swallowed.

What choke looks like

- **Droping saliva.**
- **If the animal tries to swallow, chewed food or water may come down the nose.**
- **The animal is distressed.**
- **It may be possible to feel the blockage in the neck.**

How to prevent choke

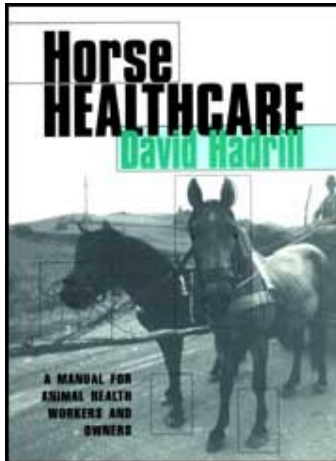
Soak dried food in water before feeding it.

How to treat choke

- **Do not give food or water.**
- **Most cases do not need any treatment, but it may take**

several hours for the blockage to pass.

- **Very carefully pass a stomach tube (see the section *How to use a stomach tube*).**
- **Drugs to stop muscle spasm may be useful, for example, hyoscine with dipyrone (Buscopan).**



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13. Diarrhoea, worms and other parasites living inside

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the body

13.1 Diarrhoea of adults

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What causes diarrhoea of adults

In many cases the reason for diarrhoea is not found out. Some of the causes are:

1 stress,

2 food, for example:

- **a sudden change of diet (such as, a lot of fresh grass, or too much grain),**
- **mouldy food,**

3 parasitic worms,

4 infections, which may cause blood-stained diarrhoea,

5 eating sand,

6 tumour (cancer) affecting the gut,

7 allergy.



Diarrhoea can be caused by *Salmonella*, which can make people very sick. After handling or treating any animal with diarrhoea, always wash your hands carefully with soap.

How to treat diarrhoea of adult animals

- **Fluids. All cases with diarrhoea should be encouraged to drink as much as possible. Offer the animal a mixture**

of:

4 litres of clean water

8 heaped tablespoons of sugar

1 heaped teaspoon of salt

Mix fresh each day, and throw away what has not been drunk after 24 hours. If the animal is too weak to drink, liquid can be given by stomach tube. See the section *How to use a stomach tube.*

- **Wash the diarrhoea off the skin and hair around the tail. Bandage the tail to help keep it clean.**
- **Keep the sick animal away from others.**
- **Give natural yoghurt. This can be given by stomach tube.**
- **Targetted treatment. If you are able to, decide the**

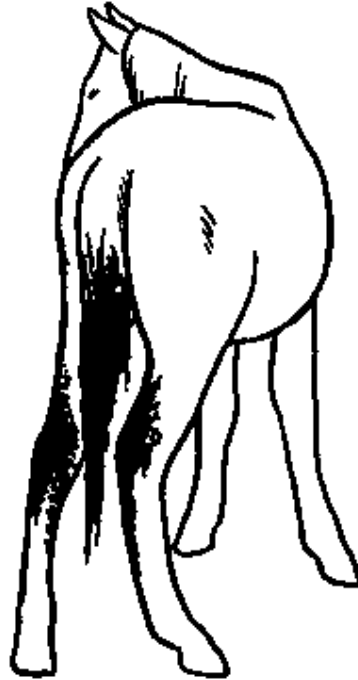
possible cause and give a treatment appropriate for it.

Treatment of diarrhoea in adult animals

<i>Cause</i>	<i>How to treat or prevent</i>
Stress	Remove stress
Change of diet	Make changes slowly over a period of several days
Mouldy food	Replace with fresh food
Worms	Treat with anthelmintic (see sections about worms)
Infections	If there is fever, antibiotic injections may be useful
Sand	Graze animals away from sandy places; provide alternative food
Tumour	No effective treatment exists, so euthanasia may be appropriate

Allergy

Avoid access to the allergen, for example, mouldy food



ANTIBIOTIC INJECTIONS

Antibiotics do not help cure most types of diarrhoea, even those

caused by infection. In fact, it is believed that sometimes antibiotics cause colitis, which results in diarrhoea.

Antibiotics suitable for injection when an animal has diarrhoea caused by an infection are sulphonamides or penicillin-streptomycin or ampicillin.

13.2 Diarrhoea of foals

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Causes of diarrhoea of foals

- 1 Mother in heat (about ten days after birth and again three weeks later).**
- 2 Parasitic worms.**
- 3 Infections.**

How to treat and prevent diarrhoea of foals

- Mix the same solution as described for adults and**

encourage the foal to drink as much as possible,

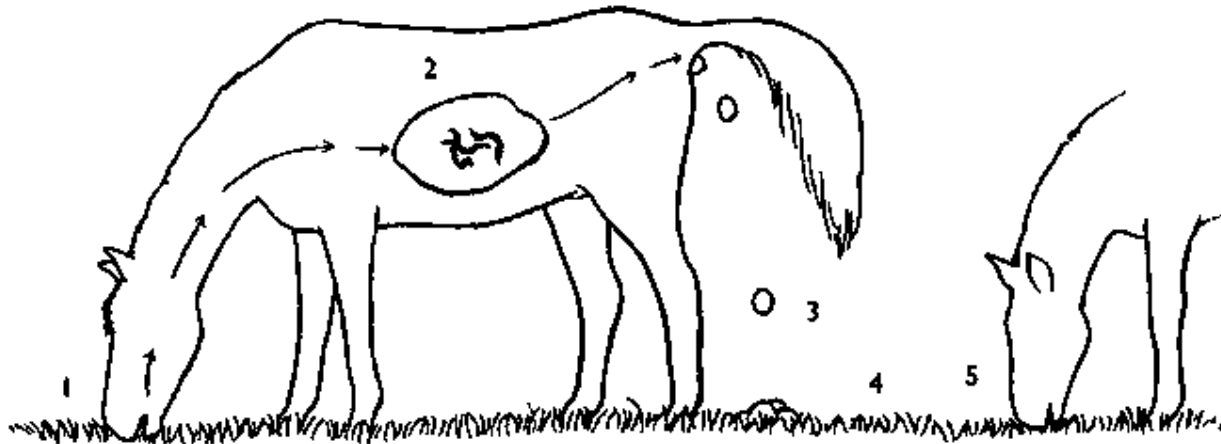
- **keep the foal warm,**
- **decide the likely cause and give a treatment appropriate for it.**

Treatment of diarrhoea in foals

<i>Cause</i>	<i>Treatment</i>
Mare in heat	No treatment necessary because the diarrhoea will pass when the mare is no longer in heat
Worms	Treat with medicine to kill worms (see later in this chapter)
Infections	If the foal has a fever, give antibiotic injections (see note above on antibiotic use for diarrhoea of adults)

13.3 The life stories of worms

There are variations with different kinds of worms, but the basic life stories of roundworms and tapeworms are given below.



Life cycles of roundworms and tapeworms

<i>Roundworm life story</i>	<i>Stage</i>	<i>Tapeworm life story</i>
Tiny roundworm larvae are accidentally	1	Tapeworm

<p>Tiny roundworm larvae are accidentally eaten with grass</p>	1	<p>Tapeworm larvae inside forage mites are accidentally eaten</p>
<p>The young worms move around in the animal's body The worms feed in the guts and they lay eggs Lung worms feed in the lungs, but their eggs are swallowed and go through the guts</p>	2	<p>The tapeworms grow in the guts and they produce eggs</p>
<p>Roundworm eggs come out in the dung</p>	3	<p>The end of the tapeworm containing eggs drops off and comes out in the dung</p>
<p>Eggs hatch and develop into tiny larvae and most die in the grass</p>	4	<p>Mites in the grass eat some eggs and they</p>

		develop into tapeworm larvae inside the mites
Some new roundworm larvae are accidentally eaten	5	Some new tapeworm larvae are accidentally eaten with a mouthful of grass

13.4 Red-worm disease (strongylosis)

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Red-worms are found worldwide. The larvae cause colic and death. The different species vary in length from about 20 to 50 mm.

What red-worm disease looks like

Red-worms cause two kinds of disease. The young worms moving around the animal's body cause one type. This can result in:

- **pain and colic,**
- **fever,**
- **loss of appetite,**
- **sudden death from internal bleeding (due to damage to an artery to the intestine).**



Red-worms - Actual size

Adult worms attach to the inside of the guts and feed on the animal's blood. This results in:

- **weakness and poor body condition,**
- **pale mucous membranes.**

How to prevent red-worm disease

- **Dose with deworming medicine two to four times per year. Ready-filled syringes to squirt into the mouth are popular in rich countries. Suitable drugs are listed at the back of the book.**
- **If the animals live in a fenced place, pick up the dung and remove it. It is best to do this daily, but removing it twice weekly can be effective. Worm eggs are removed with the dung, so there will be fewer larvae on the land to infect the horses.**
- **Deworming does not have to be done so often if dung is removed. For example, in places with a cold winter deworm at the beginning of summer and again after two months. In places with a hot climate and a rainy season, deworm at the end of the dry season and again after two months.**

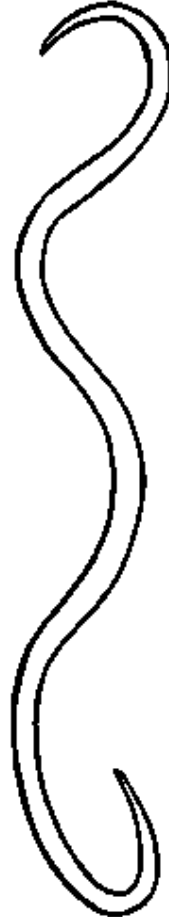
How to treat red-worm disease

There is no effective treatment for serious damage by larvae to the arteries that take blood to the intestines. At an earlier stage, treat with a worm medicine effective against larvae, for example, ivermectin or fenbendazole (Panacur).

13.5 Large roundworms (ascarid worms)

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This worm is a problem for young foals, but does not normally cause disease in adults, which acquire immunity. The worms live in the intestine.



Large roundworm (ascarid worm) - Actual size

What ascarid worm disease looks like

Heavy infections with these worm cause:

- **coughing,**
- **weakness and thinness,**
- **the foal eats, but does not grow well**
- **large, white worms are sometimes seen in the foal's dung.**

If a dung sample is taken to a laboratory, worm eggs should be seen with a microscope.

How to prevent ascarid worm disease

- **Eggs produced by worms in the foals can remain on the ground and be infective the following year, so, if possible, keep mares and foals on different ground the**

next year.

- **Treat all foals when eight weeks old. This is sufficient time for the foal's immunity to develop, but is not enough time for generations of the worm to mature, produce eggs and re-infest the foal.**

How to treat ascarid worm disease

Use any of the medicines for roundworms listed in the back of the book. Piperazine or ivermectin are very effective.

13.6 Tapeworms

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Tapeworm - Actual size - Some species are bigger and others are much smaller

These worms are not as harmful to horses as roundworms. The ones found in horses may look different from those found in other animals, or in humans. They live in the large intestine and may be up to 80 cm long, depending on the species of tapeworm. More often they are less than 20 cm long.

What tapeworm disease looks like

- **There are usually no signs of infection.**
- **Large numbers of tapeworms may help cause blockage in the gut and colic.**

How to treat tapeworm disease

Drugs for roundworms are not effective. It is possible to use pyrantel (Strongid P). See the list of medicines at the back of the book.

13.7 Bots, Gasterophilus larvae

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These are the maggots of flies, which lay eggs on the hairs of horses and donkeys, often on the front legs, neck or face. The horse or donkey swallows the eggs when it licks its coat. The bots live inside the stomach.

Sometimes bots can be seen attached just inside the back passage when the horse passes its dung. One type of bot reattaches here for a few days just before leaving the horse's body to develop into the adult fly. Bots are sometimes seen in the dung. At post-mortem examination it is common to see

groups of them attached inside the stomach.



Bot (*Gasterophilus larva*) Actual size

Bots are not thought to cause serious disease. Where the eggs first hatch tiny maggots may irritate the skin, especially around the lips. Older bots can damage the lining of the stomach, leading to ulcers.

Bots can be treated with ivermectin or organophosphorus drugs. See the list at the back of the book.

13.8 Pinworm (Oxvuris)

Causes itchiness under the tail. See the chapter *Diseases and parasites of the skin*.

13.9 Lung worms

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See the chapter *Diseases affecting breathing*.

13.10 Liver fluke disease

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The fluke is a leaf-shaped parasite that lives in the tubes (bile ducts) of the liver. It causes disease more severely and more frequently in cattle, sheep and goats than horses.



Liver fluke Actual size

What liver fluke disease looks like

Flukes are believed to sometimes cause tiredness, loss of appetite and swellings (oedema) on the skin. There are no signs unique to the disease.

Experienced laboratory workers may find fluke eggs in a dung sample looked at with a microscope. See the section *How to collect samples for laboratory tests.*



How to prevent liver fluke disease

Animals become infected when eating leaves in swampy areas, so avoid grazing these places if flukes are a problem.

How to treat liver fluke disease

Oxyclozanide (Zanil) or triclabendazole (Fasinex) are used to treat fluke in cattle and can be used for horses.

13.11 Leech

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When a horse or donkey drinks, a leech living in the water will sometimes attach to the inside of the mouth. Leeches may stay attached for several hours as they engorge on the animal's

blood.

What leeches look like

- **The first sign that a leech has attached may be blood in the animal's mouth.**
- **Hold the tongue and look inside the mouth, including under the tongue. A dark red leech may be seen.**

Leech - Actual size - Size varies with different species, and before and after feeding on blood.

How to treat leeches

Carefully pull the leech off. The wound may bleed for some time after removing the leech, because leeches produce chemicals that slow down blood clotting. However, the wounds rarely become infected and no other treatment is necessary.

13.12 Hydatid disease

The hydatid is the larva of a small dog or fox tapeworm called *Echinococcus granulosus*. The dog gets the worm when it eats meat containing the tapeworm larvae. This may be sheep, cattle or pig meat or horse or donkey meat, especially offal such as the liver and lungs. In horses, the liver is where the larvae, called 'hydatids', are most commonly found.

Hydatid disease is serious for people, so if you suspect it in animals, try to get advice from a medical worker about how to protect people from it.

What hydatid disease looks like

It is usually only seen after a horse has died: the liver and lungs in particular may have bubble-like growths with a whitish capsule. These cysts may be the size of tennis balls, or as large as 20 cm across. They have clear liquid inside. This liquid contains small, white specks.

Treatment

There is no treatment for hydatid disease in horses and donkeys.

Dogs should be treated with a medicine effective against the tapeworm, for example, praziquantel. People should always wash their hands very carefully with soap immediately after touching dogs that may carry this tapeworm.



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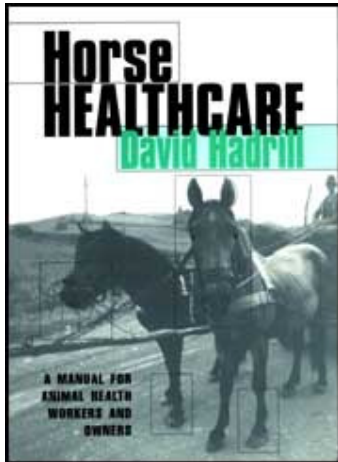
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14. Thin animals, liver disease and diseases causing urine problems

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14.1 Thin animals

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Horses and donkeys become weak and thin when they use more

energy than they get in their diet. This can have many causes. Some of the important ones are shown in the table.

Thin animals: causes and treatment

<i>What makes horses and donkeys thin</i>	<i>How to treat the problem</i>
Not enough food	Give more food
Not enough energy in the food, for example, too much straw and not enough grain	Add some high quality food to the diet
	Carbohydrates are a good source of energy; for example, starch in grains (such as oats, sorghum, or barley) or raw cane sugar (called <i>jaggery</i> in India)
	Fats, such as vegetable cooking oil, are a

	<p>very good source of energy; a cup of cooking oil can be added to each feed; linseed or rapeseed oil can be given Give some fresh green food as well</p>
Not a mixed, balanced diet, for example, only chopped dry straw or chaff (<i>boussa</i>)	
	Make sure there is also enough energy in the food
	Young horses fed only bran may get problems with bone growth causing a swollen head; this is caused by the wrong balance of calcium in this food
Bad teeth	Check teeth; rasp if necessary (see section <i>Tooth rasping</i>)
Worms	Treat (see chapter about worms and the list of drugs at the back of the book)

Too much work	Reduce the work, give more time to rest, lighten the load
	Allow more time to graze
Slowly developing liver disease	See next section
Other disease, such as chronic infection or cancerous growths	Try to work out what kind of disease it is
	Refer to appropriate section of the book for suggested treatment or ask for help from a veterinarian

Advice for feeding a thin, sick horse

- **If a starved horse is fed too much too quickly, it may get diarrhoea and colic.**
- **Therefore, feed small amounts often.**

- **Gradually increase the amount of food each day.**
- **Give 0.75-1 kg of grain five or six times per day.**
- **Take away food that has not been eaten after two hours.**
- **For animals with a poor appetite, encourage feeding by offering fresh, green leaves, such as alfalfa, or molasses. Hay should be fresh, not old, dusty or mouldy.**
- **Thin horses will benefit from the energy in vegetable cooking oil. Add it to the feed, making a total of up to 0.5 litre per day.**

14.2 Liver disease

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Liver disease may happen suddenly or develop slowly. Liver disease is quite common in horses and often causes death.

Poisonous plants, chemicals eaten by the horse or infections can all cause sudden liver disease. Arsenic and lead are

examples of chemicals that damage the liver.

What sudden liver disease looks like

- **Animal stops eating,**
- **constipation usually,**
- **dark-coloured urine,**
- **behaves in a dull manner,**
- **may stand with half-eaten hay hanging from its mouth,**
- **in most cases the mucous membranes have a yellowish colour (jaundice), but jaundice does not always mean liver disease,**
- **photosensitization (see the section *Sunburn, photosensitization*) sometimes causing oozing cracks on the lips and muzzle and a blue-grey colour to affected skin,**

● **sometimes, in the most severe cases, strange behaviour such as:**

- **walking round in circles or wandering aimlessly,**
- **pressing head against a wall,**
- **mad excitement,**
- **fits.**

A NOTE ABOUT JAUNDICE

Yellowish mucous membranes (see the section *How to check the mucous membranes*) are a common sign in liver disease.

However, some animals have mucous membranes that always look a bit jaundiced, especially Arab horses, grey horses and donkeys. Any horse that has not eaten for a few days can look mildly jaundiced. Do not assume that yellow colour of the mucous membranes always means liver disease.

How to prevent sudden liver disease

Avoid access to known poisonous plants or to poisonous chemicals, such as old car batteries containing lead.

The cause of slowly developing (chronic) liver disease may be poisoning by plants in the *Senecio* family, such as ragwort.

What slowly developing liver disease looks like

- **Slow loss of weight,**
- **pale mucous membranes,**
- **loss of appetite,**
- **weakness and unsteady walk,**
- **swelling (oedema) under the belly,**
- **photosensitization,**

- **eventually, in the most serious cases,**
 - **yawning,**
 - **pressing head against a wall or tree,**
 - **standing with food in mouth,**
 - **staggering,**

- **finally, the horse goes down to the ground and dies.**

How to treat liver disease

Even with treatment, many cases of severe liver disease do not survive. Milder cases of sudden liver disease can be treated. However, if the animal shows signs of strange behaviour, such as mad excitement, euthanasia is recommended.

- **Give the animal complete rest.**

- **Keep it out of sunlight.**

- **Feed hay and avoid foods with more protein, such as alfalfa or manufactured pellets. Add glucose to the diet.**
- **Encourage the animal to drink well.**
- **If it does not drink, give liquid by stomach tube (see the section *How to use a stomach tube*). It is best to give a salt solution. A recipe is given in the section *Diarrhoea of adults*.**
- **Give multivitamin injections containing B vitamins and vitamin K.**
- **If constipated, give 500 ml liquid paraffin (*not* kerosene or paraffin fuel) by stomach tube. Repeat once daily as necessary.**
- **Antibiotic injections, such as trimethoprim-sulphadiazine, dose 15-30 mg per kg body weight.**

14.3 Red urine

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Urine problems are rare with horses. Horse urine is usually cloudy and rarely clear. Cloudy urine does not indicate disease.

Urine may be red because it has blood in it. It may also be red because a disease has damaged the red blood cells, and the red pigment from blood has dissolved in the urine. To tell the difference, collect some red urine in a small bottle. Put the bottle where it will not be moved and leave it for 30 minutes. If it contains red blood cells, the red colour is stronger at the bottom of the bottle. If the urine has red pigment in it, the red colour stays evenly in the whole sample.

Diseases which can cause blood in urine

- **Kidney infection,**
- **heavy infestation with red-worms (the larvae occasionally get into the kidneys),**
- **bladder infection,**

- **stones in the bladder,**
- **stones in the tube leading from the bladder to the outside (not usually a problem of females).**

Diseases which can cause red pigment in the urine

- **Equine infectious anaemia.**
- **Babesiosis.**

14.4 Kidney and bladder infections

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What kidney infection looks like

- **Blood and pus in the urine,**
- **fever,**
- **loss of appetite,**

- **pain in the belly,**
- **weight loss.**

What bladder infection looks like

- **Blood and pus in the urine,**
- **often passes small amounts of urine,**
- **pain when passing urine,**
- **stands stretched out.**

How to treat kidney or bladder infection

- **Antibiotic injections. Use penicillin or sulphonamides. Treat for two weeks.**
- **Encourage the animal to drink water.**

14.5 Stones in the urine

What the disease looks like

- **Usually occurs in a male animal,**
- **often tries to pass urine, but the tube may be blocked,**
- **blood in urine,**
- **straining to pass urine,**
- **sometimes stones may be felt under the skin, beneath the tail, below the anus.**

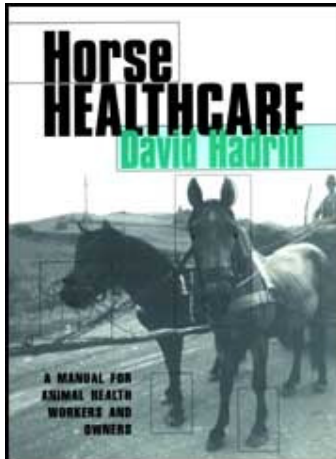
How to prevent stones in urine

Always give working animals enough clean water to drink. Offer water to them every few hours.

How to treat stones in urine

If an animal has this problem, treatment by a trained vet is needed.

A veterinarian may squirt saline in through a catheter to flush the penis and give an injection of a smooth muscle relaxant, which may help the animal to pass the stones.



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15. Birth and care of foals[▲ Top](#)

15.1 Normal birth

Most births occur at night and when the mare thinks she is not being watched.

One month before

- **Swelling of the udder occurs from three to six weeks before foaling.**

One day before

- **Droplets of colostrum (first milk) usually appear on the nipples 6-48 hours before birth.**

Four hours before

- **The mare becomes restless and appears to have colic (kicks belly, swishes her tail, is unrelaxed).**
- **She wants to find a place on her own.**

- **She sweats at the shoulders and sides.**

Birth (usually takes 10-30 minutes)

- **Watery fluid pours out of the birth canal.**
- **The mare strains powerfully and usually lies down.**
- **A bag of fluid appears under the mare's tail with the foal's front feet inside it.**
- **The bag breaks, the head and body of the foal are pushed out and the foal takes its first breaths.**

Note: Do not tie or break the umbilical cord because blood flows along it into the foal's body - wait for it to break naturally. The foal will be stronger if you do not break or cut the cord.

The 'afterbirth' (usually takes 30 minutes to 3 hours)

The mare continues to strain until the afterbirth (placenta) comes out. She does not normally eat it.

15.2 Helping with difficult births

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If forceful straining by the mare has continued for several hours, there is probably a problem. The foetus may not be coming normally. It is normal for a foal to be born with its two front feet first followed by its head and shoulders. If any other parts of the body come first, birth is difficult.

Normal birth: the two front feet and head should come out first.

Normally the foetus comes out in an upright position, that is, its back is towards its mother's back and its belly is towards its mother's belly. If it is rotated inside, there may not be a normal birth.

Mares' contractions are very strong and there is little time

(compared with calves) after the main contractions start before the foal must be out and take its first breath. In problem births, the foal usually dies. Difficult births are dangerous for the mare. This is not an easy matter to deal with: get immediate professional advice if you possibly can.

Useful equipment

Buckets of clean water and soap

Ropes with a loop tied in one end

Getting ready to help with a difficult birth

- 1 Make sure you do not have long fingernails.**
- 2 Take off any watch or jewellery on your hands or wrists.**
- 3 Bandage the tail so that hairs do not get in the way.**
- 4 Ask an assistant to hold the tail aside.**

5 Wash around the lips of the birth canal with soap and water.

6 With clean water, wash hands and arms. Make your arms slippery with lots of soapy lather.

Restraint

Reduce the risk of being kicked by the mare. If she is a quiet animal, apply a twitch and have an assistant hold up a front leg. If the mare is nervous, cast the mare and tie the feet. See the chapter *How to tie, restrain and transport horses and donkeys*.

Key questions and things to look for

How long has the mare been trying to push out the foal? If it is more than 24 hours and the straining has stopped, most of the slippery fluid that helps normal birth will be lost.

Look to see if there is a dark, brown discharge. This is a sign that a very delayed case has started to putrefy (go rotten) inside the mother. Is there any injury around the birth canal?

Look for tearing.

Putting your hand inside

Put an arm inside. What can you feel? For example, are there:

- **one or two feet?**
- **neck with mane, or ears, or mouth?**
- **no legs or head?**
- **twisted folds in the birth canal?**

How to decide by feel if feet are front ones or back ones

The front leg has the knee above the fetlock joint, but the back leg has the angled hock joint above it. The fetlock joint and the joint above it bend the same way on a front leg, but on the hind leg, the hock joint above the fetlock bends the other way.

Try to work out which parts of the foal's body are coming first

Decide if it is coming normally, or not. If not, the aim is to try to move the head and two front feet to the normal position and then pull out the foal.

How to put ropes on the foetus

The loop at the end of the rope can be attached like this:

After using, ropes should be washed well and boiled or soaked in antiseptic, such as Savlon solution.

Lubrication

It is very much harder to pull out a dry foal than one which is still wet from the liquid which surrounds the foetus before birth. It helps a lot to introduce warm, clean, soapy water with a funnel and tube. Also, be sure your hands and arms are wet and slippery (with soap) before putting them inside the mare.

Oxytocin

Once you are sure that a foal is coming the right way, the mare may push it out with contractions of the uterus muscle without needing much pulling on the ropes.

If the contractions stop, experienced operators may give oxytocin slowly, by injection, to induce these contractions.

15.3 Some of the more common types of difficult birth

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DIFFICULT BIRTHS ARE NORMALLY A JOB FOR A QUALIFIED VETERINARIAN. IF THERE IS NO ALTERNATIVE BUT FOR YOU TO HELP, TAKE GREAT CARE (1) NOT TO BE KICKED BY THE MARE, AND (2) NOT TO CAUSE UNNECESSARY SUFFERING TO THE MARE.

Head back

This is difficult because the neck is long, so it is difficult to

reach the head and pull it forwards. Try to get veterinary help.

Sometimes, in the case of a small foal in a small horse or donkey, it may be possible to put an arm inside, cup it round the nose, and pull the head forward. At the same time, push the foal's shoulder back with your other hand.

The foal lies across the birth canal (ventro-transverse presentation)

This is also very difficult to sort out. Feel up the feet to make sure it is not a case of twins. It is important to get veterinary help if you can. The vet will use anaesthetics to stop the mare from straining to push out the foetus while the operator is pushing legs back in.

If the mare is exhausted, and not straining, there is a chance of helping to deliver the foal. Cast the mare, tie her feet together (see the section *How to restrain horses and donkeys*), and turn

her onto her back. To help to turn the foetus it is necessary to replace the lost foetal fluids in the mare with warm, clean soapy water.

Attach ropes to the two back feet of the foetus. Get an assistant to gently pull these while you push the head and front feet back inside the mare. Now pull the foal out back legs first.

Dog-sitting position

At first this case looks normal: the head and two front feet are coming. When you put your arm in the birth canal, you will feel the hind feet on the floor of it. If the owner of the horse has been pulling the head and two legs, and the mare has been straining, the foetus may be firmly stuck.

If the head and front feet are already out of the mare, the only way to get the foetus out is to cut it into pieces. This is a job for a veterinary surgeon, who will anaesthetize the mare.

If the case is not so advanced, use lots of soapy water in the birth canal. Push the foetus back so the hind feet can be pushed back inside. Then pull the head and front feet out to deliver the foal in the normal position.

Head and neck down between the forelegs

Put a rope loop around the lower jaw. Get an assistant to pull this while you push back on the forehead of the foetus.

If this does not work, tie the mare's feet together (see *How to cast a horse* or *How to cast a donkey* in Chapter 1), roll her on her back and then try again.

Lower front leg back

Push back the foetus' shoulder at the same time as bringing its foot forward. Cup the foot in your hand while you pull it, to protect the womb from injury.

Whole front leg back

When the foetus is already dead, it may be necessary to cut off its head before bringing the rest of it out. Then, push it backwards, reach inside and pull the leg forwards.

Twisted pregnant womb (uterine torsion)

If, when you reached inside the birth canal when examining the case, spiral folds were felt in the wall, it suggests that the foal inside the womb has revolved inside the mare. These spirals show which way the womb has twisted.

Try to get your hand through the twisted folds to the foetus, hold on to a leg, and twist it in the opposite direction to the folds. The foal cannot be born while the womb is twisted.

15.4 Tearing around the birth canal

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During a birth, the powerful contractions can lead to injury around the birth canal. Sometimes the foot of a foetus is pushed through the roof of the birth canal into the back passage down which the mare passes its dung.

Later there can be problems with dirty material causing infection of the vagina and womb. In most cases the animal can continue to work, but she is unlikely to get pregnant again.

The only treatment for these injuries is an operation by a veterinary surgeon. Surgical repair is done several months after the birth.

15.5 Retained placenta

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Sometimes, the mare does not push out the afterbirth after delivering the foal. This can lead to laminitis and infection in the womb.

Leave alone for 24 hours. If the mare continues to be well in herself (eating, normal temperature and pulse rate), do nothing. Usually, it will come out in the next 24 hours with some foul-smelling, bloody fluid.

If the mare is not well, the placenta should be removed by hand. Wash your hands and arms very well. Have an assistant hold the tail to one side. Make sure the mare is restrained so that you cannot be kicked: get someone to hold a front leg up and have someone else apply a twitch if necessary.

With one hand, twist what hangs out of the back of the mare into a kind of rope. Put the other hand inside the mare and carefully move your fingers between the placenta and the wall of the womb to separate the two. Do not pull hard (or the womb may be pulled out - see the section *Prolapse of the uterus* below). When it is all separated, it should all come out.

If the mare has a raised temperature, and is not well, give

antibiotic injections for three days.

15.6 Mastitis

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Mastitis is caused by infection in the mammary gland or breast tissue of the mare. It is not common in horses and donkeys.

What mastitis looks like

- **The mammary gland is hot and tender.**
- **Swelling (oedema) often develops in front of the gland.**
- **The mare may be ill, off her food and have a fever.**

How to treat mastitis

Gently milk out the teats. Remove as much as possible (it may not look like normal milk) and repeat once an hour if possible.

Give antibiotic injections, for example, streptomycin with penicillin or trimethoprim with sulphonamides.

Tubes of antibiotic are used for cows with mastitis: the contents are squirted into the mammary gland. These tubes can be used in mares. Follow the instructions on the tube. However, the mare has several openings in the teat, unlike the cow, and the openings are smaller than a cow's. Only use tubes with a thin nozzle.

15.7 Hypocalcaemia, eclampsia, transit tetany

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Hypocalcaemia means low calcium in the blood. Calcium is needed for normal muscle action. The condition can occur in mares producing milk or in any horses after transporting.

What hypocalcaemia looks like

- **Sweating,**

- **stiff legs,**
- **twitching of muscles,**
- **the animal does not pass dung or urine.**

The third eyelid is not across the eye, as in tetanus, which also causes stiff legs and muscle tremors.

Animals mildly affected after transport often recover without treatment. However, more seriously affected cases and mares producing milk go down after about 24 hours. Without treatment these cases may die two days after the illness started.

How to treat hypocalcaemia

Give calcium borogluconate solution by slow injection into the jugular vein. The solution is usually used at 20% and the quantity needed is around 500 ml. It is given to effect: this

means, give it slowly until the signs of hypocalcaemia start to disappear. This treatment usually results in complete recovery within about an hour.

15.8 Prolapse of back passage (rectum)

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Part of the end of the tube which dung passes through may turn out of the body during birth. It normally goes back inside when the birth has completed.

If it does not go back, starve the mare for one to two days. Lubricate the rectum using water-soluble gel (KY Jelly) or very soapy water. Carefully push it back inside.

A serious case can develop if it has stayed outside for a long time and/or the attachments holding it inside were damaged during birth. If the part of the back passage tube that sticks out becomes a dark, purplish colour, there will be little chance of saving the life of the mare.

15.9 Prolapse of the uterus

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This condition, when the womb turns inside out after a birth and hangs down below the tail, is rare in horses and donkeys. When it occurs, there is usually tearing of internal blood vessels and internal bleeding. Mares often die if the uterus prolapses.

If it occurs, stand the mare facing down a slope, and wash any dirt off the womb. Then, push the womb back inside her.

If she struggles, for safety, tie her feet together, and roll her on her back to replace the organ (see the section *How to restrain horses and donkeys*). Again, try to find a place so her head is downhill from her tail.

15.10 Care of newborn foals

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How to prevent foal diseases

THE FIRST MILK, COLOSTRUM

It is very important to make sure that, before it is 8-12 hours old, the foal drinks its mother's milk. This milk, called colostrum, contains antibodies that pass from the foal's stomach to its blood. Like temporary vaccination, the antibodies protect the foal from diseases.

If the foal is unable to suck, gently milk the mare into a bucket. Pour this into a bottle and feed the foal from the bottle. To make a teat, put a condom with a hole in it on the end of the bottle. Give 500 ml at a time. Feed once per hour until the foal has had a total of 1-2 litres of colostrum.

HYGIENE

Make sure that the floor where the newborn foal is kept is clean. There should be clean bedding, such as straw, from when it is

first born. If the floor is dirty, it is more likely that the foal will get infection in its umbilical cord. This infection can enter the blood and cause joint-ill.

Diarrhoea

See the section *Diarrhoea of foals* in the chapter *Diarrhoea, worms and other parasites living inside the body*.

Failure to produce dung, retained meconium

Meconium is a substance that forms in the intestine during the foal's life in the womb. It is normally passed in the womb or as the first, hard dung after the foal is born. However, the meconium can be very hard and can cause a blockage.

WHAT RETAINED MECONIUM LOOKS LIKE

The foal may crouch and keep straining with its tail up as it tries to pass dung. It may be possible to feel hard material with a finger in the back passage of the foal.

HOW TO TREAT *RETAINED MECONIUM*

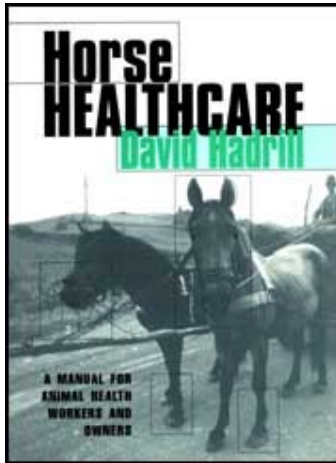
- **Put a 10 cm piece of plastic tube from an old intravenous drip on the end of a 20 ml syringe, where the needle would go.**
- **Fill the syringe with liquid paraffin (this is not kerosene, but is a clear, oily liquid) or castor oil. If neither of these are available, use warm, soapy water.**
- ***Very* carefully, insert the tube into the rectum of the foal and slowly inject the oily liquid. The wall of the rectum of foals is not tough. Be careful not to damage it.**



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16. Eye problems

16.1 The healthy eye

How to prevent eye problems

- **Every day wash around the eyes with a clean, wet cloth. This helps to get dust and dirt out of the eyes.**
- **Control flies and/or use fly repellent (see the chapter *Diseases and parasites of the skin* for advice on controlling flies).**
- **Use a fly fringe.**
- **If blinkers (blinders) are used on nervous, working horses in towns make sure that they are fitted properly and do not bang against the eye when the horse is trotting.**

16.2 Injuries of eyelids

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The eyelids are commonly injured. Sometimes they become bruised and swollen. More serious injuries also happen, in which the eyelids are torn.

How to treat eyelid injuries

BRUISING

- **Bathe the area around the eyes with cotton wool soaked in cold, clean water.**

CUTS

- **If the eyelid is torn, when it heals the wound may contract. Therefore, it is better that these wounds are stitched when the wound is less than six hours old. Get help from a veterinarian if possible.**

- **Put antibiotic eye ointment into the eye.**
 - **Make a fly fringe for the horse to keep insects from landing on the wound.**
-

16.3 Things in the eye

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Horses and donkeys may get pieces of hay or straw, insects or other things in their eyes. The object may get stuck under the third eyelid.

What the affected side looks like

- **Eyelids closed,**
- **swollen eyelids,**
- **more tears.**

How to treat it

1 Examine the eye.

Get a helper to hold the animal's head firmly. Look carefully in the eye for any injury or object. Hard objects like grit can scratch the surface of the eye (see next section).

Things in the eye are very painful. To look properly, drip special local anaesthetic for eyes on to the surface of the eye. Wait for a few minutes for the anaesthetic to take effect. Sometimes objects get under the third eyelid, so look carefully at the edge of it.

2 Remove the object.

With your finger and thumb, or with tweezers, carefully pick up the object and remove it from the eye. Make sure the animal's head is held firmly.

3 Flush the eye.

With clean, boiled water, squirt the surface of the eye using a

syringe without a needle.

4 Ointment.

If the surface of the eye is scratched, use ointment as described in the next section.

16.4 Damage to the surface of the eye

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The surface of the eye, called the cornea, can be damaged by straw or twigs and other things that get into the eyes, or by accidents where the surface of the eye is hit.

What damage to the surface of the eye looks like

- **The surface of the eye may be grey-white instead of clear.**
- **A small crater may be seen on the glassy surface of the eye.**

- **The eye is watering more than usual.**
- **The animal may keep the eye closed.**
- **If infected, there may be yellow-white discharge around the eyes.**
- **Later on, when a deeper injury is healing, a small blood vessel grows across the surface of the eye as the damage heals.**

How to prevent injury to the surface of the eye

See the note about fitting blinkers (blinders) properly in the section *The healthy eye*.

How to treat injuries to the surface of the eye

Prevent infection with eye ointment containing antibiotic (such as oxytetracycline, neomycin, chloramphenicol). See the list of ointments at the back of the book. See the next section for how to use it.

Do not use ointment containing corticosteroid (such as prednisolone, betamethasone) because these drugs slow down the rate of healing.

16.5 Infection around the eyes, conjunctivitis

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What conjunctivitis looks like

- **Reddened skin inside the eyelids.**
- **More tears and usually a sticky, yellow discharge around the eyes.**

How to prevent conjunctivitis

- **Control flies, which carry infection to the eyes.**
- **A fly fringe is useful to keep flies out of the eyes.**
- **If horses' or donkeys' eyes are affected by dust, bathe around**

the eyes with clean cloth or cotton wool soaked in warm, boiled water. Use new, clean cotton wool for each animal, or you may take infection from one animal to the next on the cotton wool.

- **If one animal has eye infection, wash your hands after treating it, before touching other horses.**

How to treat conjunctivitis

Apply antibiotic eye ointment. Follow the manufacturer's instructions. Usually it is recommended that ointment is applied three or four times per day (because the tears wash medication out of the eye) and that the treatment is continued for five days.

With the thumb of one hand, roll down the lower eyelid. With the base of your other hand against the horse's head (so that if it moves its head, your hand moves with it and the end of the tube does not go into its eye), squeeze ointment along the inside of the lower eyelid.

16.6 Periodic ophthalmia. moon blindness

This is the commonest form of blindness of horses and follows a particular type of infection around the eyes. This infection comes and goes, eventually leading to damage to the eyesight. It is also called recurrent uveitis.

What periodic ophthalmia looks like

- **Usually one is eye affected, but both may be involved.**
- **More tears from the affected eye.**
- **The eyelids stay partly closed.**
- **There is pain in the eye.**
- **The animal does not like bright light.**
- **The skin inside the eyelids is red.**
- **The glassy surface of the eye may be grey at the edge.**

At a late stage, without treatment, the eye becomes greyish-white and shrunken. There is no effective treatment at this stage.

How to prevent *periodic ophthalmia*

Follow the same advice as for prevention of conjunctivitis.

How to treat periodic ophthalmia

- **Keep the horse in a darkened place.**
- **Treat with an eye ointment containing corticosteroids (see list at back of book). Continue the treatment for four weeks.**

Even with treatment, it is possible that the animal will become blind.

16.7 Growths (tumours)

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Tumours sometimes grow around the eyes in older horses. The only treatment is surgical. A veterinary surgeon must deal with these cases.

16.8 Eyelid turning in

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Some foals are born with eyelids that turn in, usually only the lower lids. The eyelashes then rub on the surface of the eyes, causing soreness and tears.

How to treat in-turned eyelids of foals

- **Inject local anaesthetic into the skin where the stitching needle will go in.**
- **Stitch together two folds of skin below the lower eyelid to stretch the skin and roll the eyelid out.**

16.9 Blocked and swollen tear ducts

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This condition commonly affects donkeys in some places, such as parts of Egypt. Some vets say that it is related to epizootic lymphangitis (see the section *Epizootic lymphangitis, pseudoglanders*), but it responds to treatment for worms, just like habronemiasis (see the section *Summer sores, habronemiasis*). Therefore, small worms are probably the cause.

What tear duct infection looks like

- **Tears roll down the cheek on the affected side.**
- **Hair is lost below the inside corner of the eye.**
- **There may be swellings below the eye.**

Advanced cases have raw skin down the face from the inside corners of the eyes.

How to treat tear duct infection

1 Treat with ivermectin (see the section *Summer sores, habronemiasis*).

2 Give antibiotic injections, for example, penicillin with streptomycin.

3 Give eye ointment containing antibiotic and corticosteroid (for examples see the list at the back of the book).

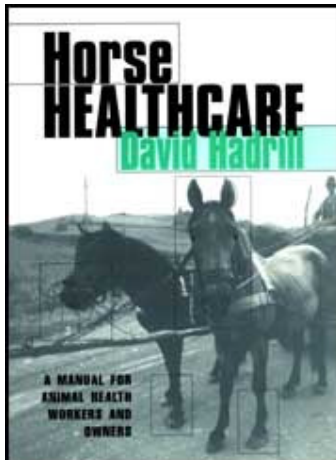
4 Trained people may flush the blocked tear duct with boiled, warm water (or salt solution used for intravenous drip). The debris is flushed up the tear duct from the nose.

Some cases have just one raw ulcer below the eye.

- **If a metal needle is used it must have a rounded end. Alternatively, a flexible plastic catheter can be used.**
- **The needle or catheter is attached to a 20 ml syringe**

containing boiled, warm water (or saline from a bag for intravenous drip).

- **The needle or catheter is put in the opening of the tear duct in the nostril and water is squirted up the duct.**
- **When the blockage is cleared, water will be seen streaming out of the inside corner of the eye.**



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17. Poisoning

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17.1 About poisons and general treatment

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Some poisons cause sudden death. Others cause a wide range of signs, depending on which parts of the body are damaged.

Many poisons have an unpleasant taste and are avoided by animals. Thin, hungry animals are more likely to eat poisonous substances.

How to treat poisoning

Some poisons have a particular treatment, described below. If you do not know exactly what the poison was, use these general treatments.

TREATMENT TO ADSORB THE POISON

- **Give charcoal by mouth or stomach tube (see the section *How to use a stomach tube*). Many poisons 'stick' (adsorb) to charcoal and so less poison gets into the body. Activated charcoal adsorbs best and is available from pharmacies.**

Charcoal made from animal bones is very good for adsorbing poison. Any charcoal has some benefit but, if using wood charcoal, grind it and make sure there are no small sticks in the mixture.

- **The dose of charcoal depends on the body weight of the animal. Mix the ground-up charcoal in water, about 200 g charcoal per litre of water. Give 500 g charcoal in 2.5 litres water to a horse that weighs 400 kg. (The dose of charcoal is 1-3 g per kg body weight of the animal.)**
- **The charcoal can be mixed with milk instead of water. Milk is helpful for poisons that irritate the lining of the guts.**
- **As an alternative to charcoal, give kaolin. The disadvantage of kaolin is that it will reduce diarrhoea, which is nature's way of getting the poison out of the body. Kaolin suspension is available as a human medicine from pharmacies. Give about 200 ml of this liquid by mouth.**

TREATMENT TO MAKE THE POISON GO THROUGH THE BODY

FASTER

- **Give a treatment to make the animal pass dung. For example, liquid paraffin (*not* fuel paraffin/kerosene) or castor oil. This is best given by stomach tube (see the section *How to use a stomach tube*), but can be given from a bottle, taking care that the animal swallows the fluid and does not choke on it.**
- **Kaolin or charcoal can be given mixed with liquid paraffin.**
- **Magnesium sulphate (Epsom salts) is also effective in speeding the passage of the poison through the guts. The dose for a horse is 200 - 300 g dissolved in 4 litres of warm water. (Smaller animals need less, according to their body weight.) It is best given by stomach tube. Charcoal can be given in the same mixture, without increasing the quantity of water.**

TREATMENT TO REDUCE DAMAGE TO THE INSIDE OF THE GUTS

- **For poisons that irritate the lining of the guts, give a mixture of eggs, sugar and milk. For an adult horse give 3 eggs and 50 g**

of sugar mixed with 250 ml milk. Repeat with the same again after 30 minutes.

17.2 Poisonous plants

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There are so many different chemicals in different plants that many different effects on animals may be seen. Most animals avoid eating poisonous plants. Some poisonous plants are more likely to be eaten if cut and dried with grass for hay.

Examples of plant poisoning

<i>What the poisoning looks like</i>	<i>Examples of poisonous plants</i>
<ul style="list-style-type: none"> • Colic and diarrhoea 	<ul style="list-style-type: none"> • Acorns, <i>Ranunculus</i> species (e.g. buttercup)
<ul style="list-style-type: none"> • Colic, diarrhoea and strange behaviour 	<ul style="list-style-type: none"> • <i>Belladonna</i> species (nightshade), hemlock
<ul style="list-style-type: none"> • Weakness, strange walking 	<ul style="list-style-type: none"> • Bracken ferns (<i>Pteridium</i> species)

<ul style="list-style-type: none"> • Weakness, strange walking and falling over (see below for more information) 	<ul style="list-style-type: none"> • Bracken ferns (<i>Pteridium</i> species) or horsetail (<i>Equisetum</i> species) eaten for a month or more
<ul style="list-style-type: none"> • Sudden death 	<ul style="list-style-type: none"> • Yew tree (<i>Taxus</i>), sorghum
<ul style="list-style-type: none"> • Photosensitization (see the section <i>Sunburn, photosensitization</i>) 	<ul style="list-style-type: none"> • <i>Senecio</i> species (e.g. ragwort), <i>Hypericum</i> species (e.g. St John's wort)
<ul style="list-style-type: none"> • Stiff walking, swelling around the roots of the teeth (secondary hyperparathyroidism) 	<ul style="list-style-type: none"> • Some tropical pasture grasses (e.g. <i>Setaria</i> species, guinea grass or <i>Panicum maximum</i>)

17.3 Bracken and horsetail plant poisoning

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Bracken (*Pteridium* spp.) and horsetail (*Equisetum* spp.) are both poisonous plants, but horses need to eat a lot for several weeks to develop signs of poisoning.

What bracken or horsetail poisoning looks like

- **Weakness and staggering,**
- **trembling muscles,**
- **eventually the animal may lie down with its neck stretched out and die.**

How to treat bracken or horsetail poisoning

Inject vitamins, making sure that the mix contains thiamine, vitamin B₁.

17.4 Lead poisoning

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Young horses are affected more than older ones. Slowly developing lead poisoning is more common than sudden, severe poisoning.

What lead poisoning looks like

- **Weakness,**
- **difficulty breathing in and snoring sounds,**
- **drooling saliva,**
- **sometimes difficulty swallowing and food may come back down nose,**
- **sometimes lung infection (pneumonia),**
- **may stagger around, appearing blind.**

How to avoid lead poisoning

- **Give enough food to reduce the animal's desire to eat strange things.**
- **Do not paint fences or the inside of buildings with paint containing lead.**

- **Do not leave old car batteries where animals graze.**
- **Do not let animals graze near factories where lead is processed.**

How to treat lead poisoning

The treatment for lead poisoning is calcium versanate (another name for this is calcium disodium ethylenediamine tetra-acetate or EDTA), dose 75 mg per kg body weight. The amount calculated for the body weight is given over a three-day period, preferably by drip into the vein (a veterinarian will be needed to set this up). Mix calcium versanate with saline so there is 20 mg of calcium versanate per litre (2% solution) in the drip solution. After four days, repeat the treatment.

17.5 Organophosphate poisoning

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Some sprays and dips contain organophosphates, which are used to kill insects and ticks. These chemicals are used to treat animals and are also common as plant sprays.

What organophosphate poisoning looks like

- **Muscle twitches and nervous appearance,**
- **sweating and diarrhoea.**
- **The centre, black part (pupil) of the eye becomes a narrow slit.**
- **If severe the animal may develop fits.**
- **Unlike other animals, organophosphate poisoning does not usually make horses drool.**

How to treat organophosphate poisoning

Give atropine injection slowly (over several minutes) into the vein, dose around 1 mg per kg body weight (the exact amount

needed depends on how much poison is in the body).

Observe the effect on the animal as you give it. If you are in a shady place and the centre, black part of the eye becomes bigger, stop giving the atropine. It may be necessary to repeat the treatment after about five hours.

17.6 Ivermectin poisoning

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Horses may become ill if ivermectin (Ivomec) injection for cattle is used. If ivermectin for cattle is injected into the muscle of the horse, sometimes these signs occur:

- **Swelling where the injection was given,**
- **swelling (oedema) of the belly,**
- **swelling of legs and eyelids,**
- **difficulty breathing,**

- **colic,**
- **sudden death.**

17.7 Mouldy food

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Some types of fungi that grow on animal food produce poisonous substances.

What disease from mouldy food can look like

- **Dull behaviour,**
- **loss of appetite,**
- **trembling,**
- **staggering,**
- **lying down,**

- **death.**

There is no treatment. Prevent this kind of poisoning by storing food dry and not giving mouldy feed to animals.

17.8 Botulism

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Botulism is a rare type of paralysis. It is usually caused by accidentally eating the poison in decayed meat; grazing animals can get botulism if a rat or mouse has died in a haystack or if water birds have died in a lake where the animals drink.

What botulism looks like

- **Trembling muscles and sweating,**
- **weakness of the legs and stumbling,**
- **weakness of face muscles gives a sleepy expression,**

- **after a few days the animal goes down and lies on its side,**
- **breathing is difficult,**
- **the animal usually dies.**

How to prevent botulism

- **Dispose of dead bodies hygienically.**
- **In the USA vaccine is sometimes given to mares during pregnancy to protect foals.**

Treatment

There is no widely available, effective treatment.

17.9 Snake bite

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What a snake bite looks like

The signs depend on which type of snake bit the horse or donkey.

- **Painful swelling that appears quickly,**
- **muscle twitching,**
- **widening of the pupil (the black part in the centre of the eye),**
- **sweating,**
- **weakness.**

How to treat a snake bite

- **If the bite is on a leg, put a tourniquet above the bite. To do this, take a strip of cloth and tie it into a loop around the leg. Put a piece of stick in the loop and twist it until the loop becomes tight around the leg. Every 20 minutes, loosen the loop for a few minutes. Continue for several hours.**

- **Snake bites often become infected. Therefore, give antibiotic injections.**
- **Check whether the animal is vaccinated against tetanus. If not give tetanus antitoxin (see the section *Tetanus*).**
- **If help is available from an expert who knows about the snakes in the area and has appropriate antidotes, give an injection of antivenin as quickly as possible.**



Horse Healthcare - A Manual for Animal Health Workers and Owners

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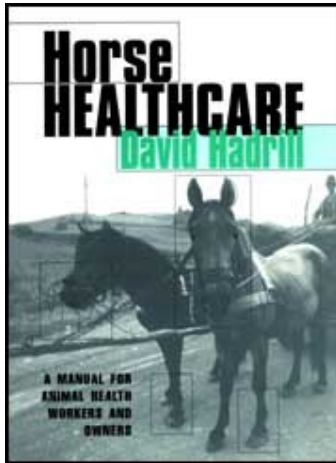
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Introduction

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How to find what you want in the book

1. Contents list

To find the section you want, look at the *Contents* at the beginning of the book. This gives the chapter headings and sub-headings. For example, if you want to know how to treat an animal for worms, in the *Contents* you will find Chapter 13, *Diarrhoea, worms and other parasites living inside the body*. As sub-headings, you will see *Red-worm disease*, *Large roundworms (ascarid worms)* and *Tapeworms*. Read these sections to decide which kinds of worms you may need to treat and how to treat them.

2. Index

At the back of the book, there is an *Index*. For each subject listed, the page number of the main reference is given in bold typeface.

3. Medicine lists

At the back of the book before the index, there are lists of the

medicines mentioned in the book. These give a summary of what the medicines are used for and how to give them.

When to get more help

It is not recommended that untrained people attempt some of the techniques described in the book, for example using a stomach tube. These techniques are indicated with the warning triangle sign.

This symbol is used in the book to show when you may need more help

About this book

This book has been written to guide readers on the appropriate action to take when caring for a sick horse, donkey or mule, in situations where they do not have professional advice. The book explains how to provide veterinary care and how to prevent many common illnesses.

The book is not intended to replace the role of the veterinary profession where an adequate animal health service exists. In poorer countries, however, owners may have no alternative but to treat their sick animals with whatever resources and advice are available locally. It is hoped that this book will help reduce animal suffering in these situations, where access to veterinary services is limited.

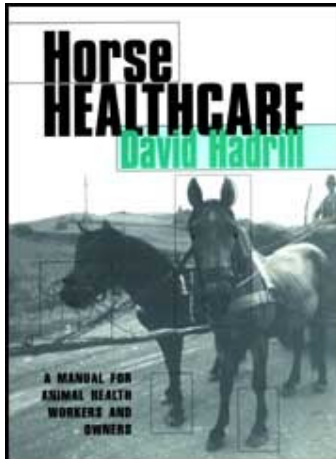
In order that the book is useful to more people, complicated or technical language has been avoided where possible. Also, there are many pictures to help make the text easier to understand.

Parts of the book may be copied freely, provided the conditions stated at the front of the book are followed. BHA and the author would be interested to see a copy of any training material made using material from this book. Please send it to:

**David Hadrill
c/o Brooke Hospital for Animals
21 Panton Street
London SW1Y 4DR**

UK

Please send suggestions for improvements to this book to David Hadrill at the same address.



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18. Teeth and how to tell the age

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18.1 Horse and donkey teeth

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The position of teeth in a horse's head

Horses' and donkeys' teeth keep growing during their lives. As the animals graze and chew, the teeth wear against each other.

Cheek teeth

The back teeth are also called 'molars'. Horses and donkeys use these teeth to grind the food before swallowing it.

Canine teeth

These teeth are sometimes called 'tushes'. They are found in the mouths of males, very rarely in mares, in between the front teeth and the cheek teeth.

Wolf teeth

Most mares do not have 'wolf teeth'. If present in the mouths of males, they grow just in front of the top row of cheek teeth.

Some people believe that wolf teeth cause problems, such as interfering with the bit. Therefore, sometimes they are removed, usually when the animal is two or three years old. Other experts do not believe that wolf teeth really interfere with the bit, which lies across the bottom jaw, and so they do not recommend that they be removed.

This is a job for an experienced person, who may use a special extractor tool for the job.

Front teeth

The front teeth are also called 'incisors'. They are used to bite and pluck the grass when an animal is grazing.

There are three pairs of front teeth. The middle front teeth are called 'centrals'. The outside ones are called 'corners'.

18.2 How to tell the age of a horse or donkey by its teeth

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Horses may live to 40 years old and donkeys to more than 50 years. You can estimate the ages of younger horses and donkeys by looking at the changes in growth and wear of the upper and lower front teeth. Ageing horses is difficult at first, but becomes easier with practice.

Like us, horses and donkeys first grow a set of temporary or

'baby' teeth, and later adult teeth. Unlike us, horses' and donkeys' teeth keep growing during their lives and their teeth wear down as they eat.

We work out the age, first, by which of the front teeth have grown. Later, we estimate the age by how much the front teeth have worn down.

Using the teeth to tell the age up to $4\frac{1}{2}$ years old is accurate. Above this age, the teeth give a guide, but the changes are less accurate indicators of the animal's age.

Horses and ponies

Horses have six top and six bottom front teeth. Foals grow all the temporary set of front teeth in their first year of life.

The adult teeth come up later. The middle (central) pair of adult teeth appears when the animal is $2\frac{1}{2}$ years old. The next adult

front teeth grow through when $3\frac{1}{2}$ and $4\frac{1}{2}$ years old. Look for the difference in size of the big adult and small temporary teeth at the age of three or four years.

At five years old, the animal has all its adult teeth. In the next years the age is estimated by the wear of the front teeth. This shows as changing patterns on the biting surface of these teeth. The pattern changes because the tooth is not the same inside all the way down. Therefore, the biting end looks different as the tooth wears down.

If we were to remove a whole front (incisor) tooth from the head of a young horse, it would look like this:

If we were to cut across the same tooth in different places, it would show how it would look on the biting surface as the tooth wears down during the animal's life.

When they first come through, the front teeth have a hollow in the biting surface. This is called the 'cup'. As the horse gets

older, this hollow gets more circular and grows to the back of the tooth, and is known as a 'mark'. A dark line is seen on the biting surface, in front of the cup. This is called the 'star'.

Later, the mark grows out and only the star is left on the biting surface.

Telling the age of horses and ponies by the appearance of the teeth

<i>Age of horse or pony</i>	<i>What the front or side of the teeth look like</i>	<i>Appearance of biting surface of front teeth</i>	<i>Description</i>
<i>Three years</i>			First pair of adult teeth has grown and is in wear.

<i>old</i>			
<i>Four years old</i>			Second pair of adult teeth is up and in wear. One pair of baby teeth is left.
<i>Five years old</i>			Third (corner) pair of adult teeth is up and is wearing down at the front.
<i>Six years old</i>			The teeth have worn level and all have a central indent called a 'cup'. The corner teeth are now wearing level.
<i>Seven years old</i>			The cup is less deep in the central pair of front teeth, where it is now called a 'mark'. There is still a good cup in the other front teeth. At seven years, a 'hook' can be seen on the side of the upper corner front teeth.
<i>Eight</i>			A dark line at the front of the teeth

<i>years old</i>			(called a 'star') has appeared on each of the central pair of front teeth.
<i>Nine years old</i>			Now no more cups, only marks. Stars have appeared on the next teeth. A groove begins to grow down the upper corner front tooth.
<i>Ten years old</i>			The biting surfaces are more triangular. The star has appeared on the corner front teeth. Stars are becoming more round and nearer the middle of the tooth. Marks are less distinct. The 7 year hook has worn away.
<i>12 years old</i>			The mark has gone from the centrals. Stars are now round. The groove in the upper corner teeth is about 1 cm long.
<i>15 years old</i>			Only stars on the teeth. The groove is now half way down the upper corner teeth.

19-20 years old			Seen from the side, the teeth have a forward slope. The groove extends down the whole tooth.
20-25 years old			The teeth have an even more forward-pointing angle and the groove is growing out (it disappears at about 30 years old). The tops of the teeth now have a more triangular shape.

Donkeys

Donkeys also have six top and six bottom front teeth. Ageing by growth of new front teeth is similar to horses. New adult incisors appear at 2¹/₂, 3¹/₂ and 4¹/₂ years old. Ageing donkeys up to five years old is done in the same as horses. After that there are some differences:

- **Donkeys' corner front teeth may not be fully in wear until nine or ten years old (compare the horse - six years**

old).

- **The cups can still be seen in some donkeys' lower front teeth until around 20 years old. In horses, the cups disappear by ten years old.**
- **The groove, which occurs from nine years of age in horses' upper corner front teeth, does not appear in donkeys. Also the hook on the same tooth which is seen in horses is not a reliable guide for ageing donkeys.**

18.3 Tooth rasping

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The back teeth of some horses and donkeys do not wear evenly. Sharp edges can develop on the cheek teeth and can stop the animal eating properly.

A good policy with all horses and donkeys more than 15 years old is to rasp the teeth once or twice per year. It is worth

inspecting the cheek teeth of all animals more than ten years old, and rasping them if necessary every few months.

What tooth problems look like

Suspect tooth problems if the animal chews for some time and spits out its mouthful.

Suspect tooth problems if an older horse is thin. A horse with poor teeth does not eat properly.

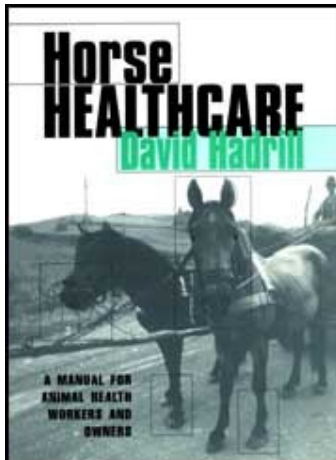
How to rasp (or 'float') teeth

The tool used is a kind of file on a handle. Ideally, for upper teeth, a rasp with a bend in the handle is used, and for lower teeth a straight

The sharp edges develop on the *outside* of the *top* rows of cheek teeth and on the *inside* (the side nearer the tongue) of the *bottom* cheek teeth. So the rasp is angled to smooth down

these edges of the rows of teeth.

An assistant holds the horse's head. The person doing the rasping normally grasps the horse's tongue and rasps the sharp edges of the teeth.



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19. Heat stress

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In hot climates, working horses and donkeys may become overheated especially in the hot season. If the over-heating is severe, the animal may die.

What heat stress looks like

- **Panting or laboured breathing,**
- **wide open nostrils,**
- **droopy, lowered head,**
- **dull behaviour,**
- **high heart rate,**
- **increased body temperature,**
- **less elastic skin.**

To see if the skin is less elastic, pinch a fold of skin on the neck. Normally, the pinched up skin will lie flat again almost straight away. If the horse is dehydrated, the skin stays pinched up for some time.

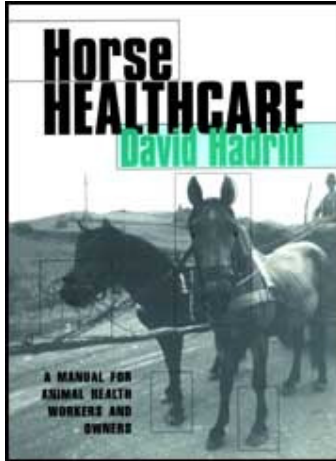
How to prevent heat stress

- **In hot weather, offer water to working horses and donkeys at least four times per day. *Little and often* is the best rule for drinking water.**
- **Give a hot animal enough time at the drinking place. If it is hot, a horse or donkey may need at least five minutes before it is ready to drink.**
- **Find a shady place for working animals to stand in the heat of the day.**

How to treat heat stress

Pour buckets of water over the animal's back. Rub the water into its hair to wet the skin.

Stand it in the shade. Offer a bucket of water to drink and let the animal rest until its breathing is normal (see the section *Temperature, heart rate and breathing*).



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20. How to shoot a horse

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The two humane methods used to kill horses are lethal injection and shooting. The drugs used for lethal injections are only available to veterinary surgeons. This section explains how to shoot a horse or donkey.

Guns are dangerous. Therefore:

- **Obey laws about gun ownership and using guns.**
- **Do not shoot if people are standing around the horse.**

- **Do not shoot a horse near a wall or a hard road in case the bullet bounces off and kills or injures someone.**
- **Be sure anyone helping you stands behind you when you fire the gun.**

Where to put the end of the gun

Imagine lines between the middle of the eyes and the middle of the base of the ears. The end of the gun is positioned above the point where the lines cross.

Angle of aim

Aim the gun as shown in the picture.

What happens when the shot is fired

If you fire the shot as instructed, the bullet goes through the

brain. The horse immediately falls down. Its body will be still, but the legs may move around for a short time. The hole where the bullet went in will bleed and blood may come out of the nose.

