

Ringworm

Ringworm is a fungal infection of the skin with a worldwide distribution. The disease is of significant economic consequence to the farmer since growth rates are affected in the active stage of infection and the disease causes hide damage.

Etiology:

The infection of hair and skin keratin with the dermatophytes *Trichophyton verrucosum* (95% of cases), and less commonly *Trichophyton mentagrophytes*, cause lesions commonly referred to as ringworm

Epidemiology:

Factors that influence susceptibility of an animal to dermatophyte infection are:

1. **Age of the animal:** Young animals are by far more susceptible to infection. This is probably related to lack of prior exposure/infection and thus no immunity. Adult cattle are also quite frequently affected. The overall incidence of ringworm based on evidence of hide damage in a number of European countries appears to be around 10% of cattle.
2. **Crowding** together young animals
3. Factors that decrease resistance to infection: **Poor nutrition, concurrent disease, previous use of immunosuppressive drugs.**
4. **Environmental factors** may play a role, since the prevalence of the disease is increased in hot, humid climates. Calves kept indoors or exposed to foggy weather with little or no sunlight have an increased incidence.
5. Other species may also be infected, including horses, sheep and also man in whom it may cause serious skin lesions.
6. The **zoonotic** implications are serious, and once ringworm is known to be on farm all precautions must be taken to avoid spread to farm staff and especially children.

Clinical Signs:

The primary changes that are observed clinically are alopecia, scaling and crusting. Lesions are characteristically greyish-white and have an ash-like surface. Their outline is circular and they are slightly raised due to the accumulation of many layers of scale and the swelling of tissues beneath due to a moderate inflammatory reaction. The size of lesions varies, 3-5 cm diameter being common; in the more severely affected animals lesions become confluent to form extensive areas of infection.

The main clinical signs are:

- Skin lesions
- Pruritus
- Hair loss
- Poor growth

Diagnosis:

Diagnosis is made on the clinical signs of the classic lesions of ringworm. The asbestos like lesions are very typical for cattle. A conclusive diagnosis requires mycological examination in the form of direct microscopy and culture.

Differential Diagnosis:

Mange
Photosensitization
Zink deficiency
Hyperkeratosis

Treatment

Treatment of ringworm in cattle faces two major obstacles:

1. The difficulty of eliminating the organism from the environment.
2. The number of animals that need to be treated.

Only **one product** is available containing Enilconazole.

- A member of the conazole family
- Needs 2 or 3 weekly applications
- Kills the surface infection but not very sporicidal
- Applied as an emulsified wash
- Penetrates into hair follicles, but unable to do so if a lot of surface encrustation exists that prevents soaking of the deep follicles

Control

- The ringworm fungus produces spores that are resistant to ordinary cleaning, and need heavy disinfection to clear them.
- Farm premises must be disinfected between batches of calves and wooden surfaces treated with creosote (tar-based wood paint)
- Animals should be handled with gloves.
- Bought-in calves or other animals should be screened for skin lesions on arrival and separated and treated until all lesions have gone. Spores may still be present.
- Prophylaxis is by vaccination and environmental disinfection. Disinfectants require high concentrations of chlorine, up to 4%.

Screwworm

Screwworms are the larvae (maggots) of a certain fly species that feed on living tissue of animals. Infestation of tissue by fly larvae is known as “myiasis

Etiology

Cochliomyia hominivorax in the New World (New World Screwworm) and *Chrysomyia bezziana* (Old World Screwworm) in Africa and Asia.

The screwworm is an insect that, in its adult stage, is about twice the size of the common housefly. It has orange eyes and a blue-gray or gray body with three dark stripes running down its back.

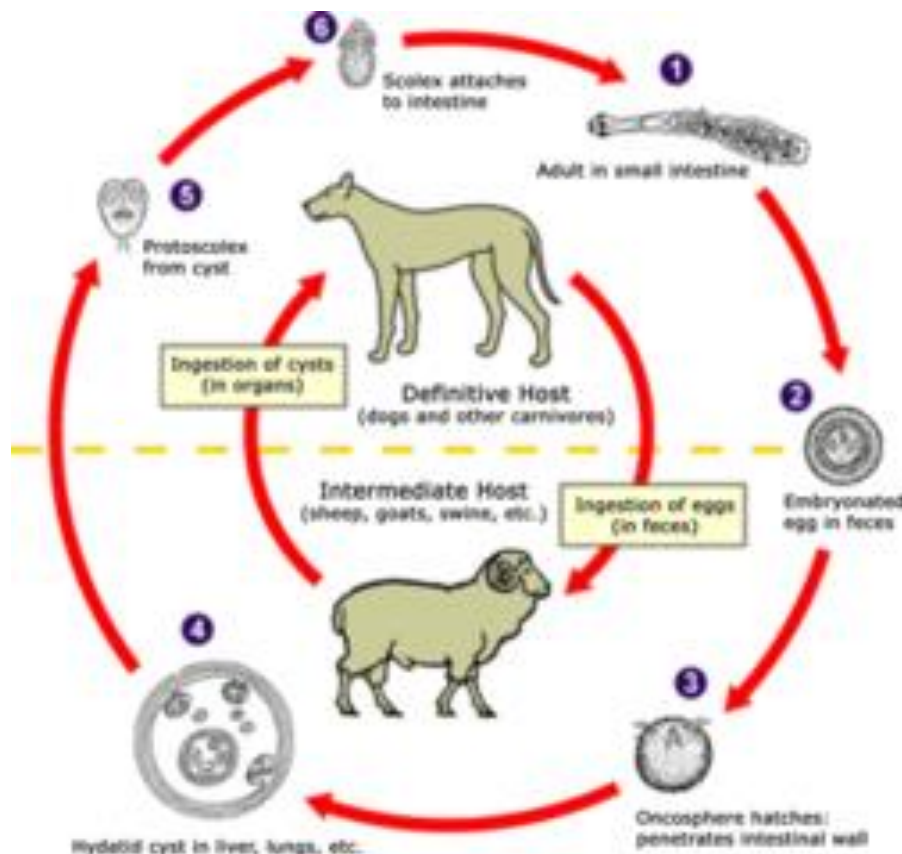
Hosts

- 1- All living warm-blooded animals can be infested by screwworm but they are most common in mammals while rare in birds
- 2- Many cases of screwworm myiasis have been documented in humans.

How can my animal get screwworm?

Screwworms (**vector**) are transmitted when a female fly lays her eggs on a superficial wound of an animal. Screwworms can infest a wide variety of wounds (e.g. tick bites, dehorning or branding wounds, wire cuts, and other injuries). Navels of newborn mammals are a common site for screwworm infestation. Wounds infested by screwworms often attract other female screwworms and multiple infestations are common.

Life cycle



Clinical signs

- 1- The young larvae invade the nearby healthy tissues vigorously and do not feed on necrotic superficial tissue. A profuse brownish exudate, composed of larval excreta, and host fluids, pours from the wound and an objectionable odor is apparent.
- 2- Affected animals show irritation in the early phase of the infestation and by day 3 show pyrexia.
- 3- Animals do not feed but wander about restlessly, seeking shade and shelter.

CLINICAL PATHOLOGY

The appearance and smell of the wound are significant but careful examination of the larvae is necessary to confirm the diagnosis. Mature larvae are 1-2 cm long and pink in color; they are pointed anteriorly and blunt posteriorly; two dark lines are visible reaching from the blunt posterior to the middle of the body and they have rows of dark fine spines on the anterior part of each segment.

Treatment

- 1- Insecticides have been compared. Lindane 3% and coumaphos 3% were the most effective but fenchlorphos 2.5%, diazinon 1.5%, chlorfenvinphos 0.05% and fenthionmethyl 0.2% were also very efficient. Stirofos (15%) and dichlorvos (20%) give season-long protection in the ears of cattle.
- 2- Ivermectin 200 mg/kg given subcutaneously kills all *Ch. bezziana* larvae up to 2 days old and many older larvae.

Control

The eradication of screwworm by genetic means, chemical control, trapping techniques and lures, and dispersal of flies has been reviewed

Lungworms (Verminous bronchitis, Verminous pneumonia)

Lung worm are [parasitic nematode](#) worms of the order [Strongylida](#) that infest the lungs of vertebrates. The name is used for a variety of different groups of nematodes, some of which also have other common names; what they have in common is that they migrate to their hosts' lungs or respiratory tracts, and cause [bronchitis](#) or [pneumonia](#).

The lungworm will gradually damage the airways or lung tissue by inciting an inflammatory reaction inside the tissue. Ultimately, the parasites survive and reproduce in the respiratory tissues. The category is thus more a descriptive than a precisely taxonomic one.

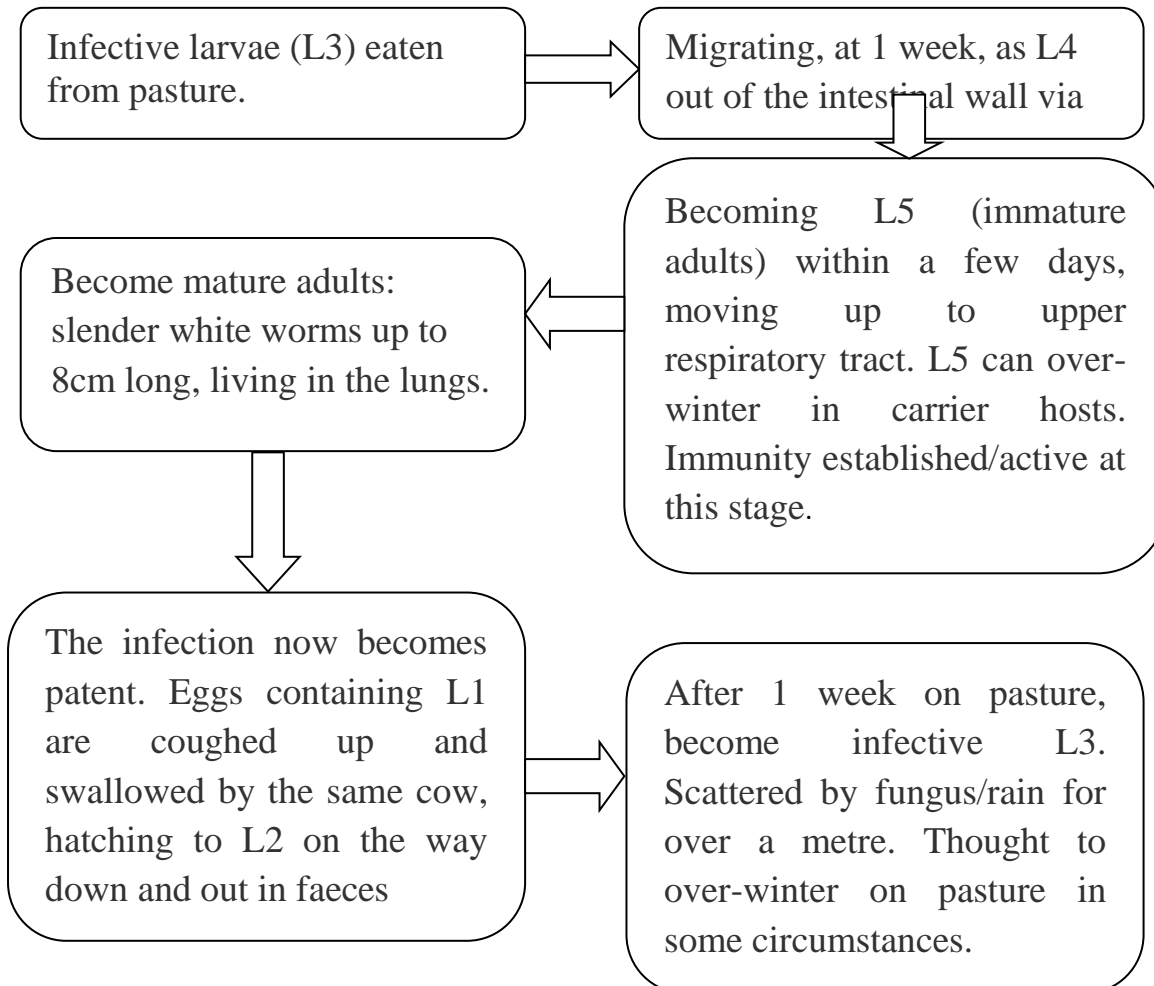
Etiology

- 1- *Dictyocaulus viviparus* in cattle, llamas, and alpacas.
- 2- *D filaria* in goats, sheep, llamas, and alpacas.
- 3- *D arnfieldi* in donkeys and horses.
- 4- *Protostrongylus rufescens* in sheep and goat.
- 5- *Muellerius capillaris* in sheep and goats.
- 6- *Oslerus osleri*, *Crenosoma vulpis*, and *Eucoleus aerophilus* in dogs.

7- *Aelurostrongylus abstrusus* and *E aerophilus* in cats.

Species of *Dictyocaulus* belong to the superfamily Trichostrongyloidea and have direct life cycles. The others belong to the Metastrongyloidea and, except for *O osleri*, have indirect life cycles.

Pathogenesis



Clinical Findings:

- 1- Signs of lungworm infection range from moderate coughing with slightly increased respiratory rates to severe persistent coughing and respiratory distress and even failure.
- 2- Reduced weight gains, reduced milk yields, and weight loss accompany many infections in cattle, sheep, and goats.
- 3- The most consistent signs in cattle are tachypnea and coughing. Initially, rapid, shallow breathing is accompanied by a cough that is exacerbated by exercise.
- 4- Respiratory difficulty may ensue, and heavily infected animals stand with their heads stretched forward and mouths open and drool.
- 5- Lung sounds are particularly prominent at the bronchial bifurcation.

Necropsy finding

Lesions Large volumes of consolidation in diaphragmatic lobes of lung, emphysema, worms up to 8 cm long in bronchi (only in patent phase of disease).

Diagnosis

- 1- Clinical signs
- 2- Necropsy finding
- 3- ELISA test
- 4- presence of first-stage larvae in feces.
- 5- Bronchoscopy can be used to detect nodules of *O osleri* or to collect tracheal washings (dogs and horses) to examine for eggs, larvae.

Differential Diagnosis

- 1- Bacterial bronchopneumonia.
- 2- Acute and chronic interstitial pneumonia
- 3- Viral pneumonia
- 4- Acute interstitial pneumonia (fog .fever)

Treatment

- 1- Ivermectin 0.05 ml/kg. S/C
- 2- Albendazole (7.5 mg/kg).
- 3- febantel (7.5 mg/kg),
- 4- fenbendazole (7.5 mg/kg),
- 5- netobimin(7.5 mg/kg).
- 6- oxfendazole (4.5 mg/kg), which are given orally, are active against all stages of the parasite.
- 7- Levamisole (oral or injection - 7.5 mg/kg; pour on - 10 mg/kg) also has activity against lungworm.

Control

A control plan could include the following aspects?

- 1- Vaccination of all cattle, then annual youngstock vaccination.
- 2- Vaccination of all incoming cattle
- 3- Control by management or rotational grazing. This is particularly difficult for *D. viviparus* control.
- 4- De-worming strategies are also difficult to manage.

Vaccination

Only one vaccine is available for lungworm. Known as Bovilis Huskvac, it is a live vaccine containing irradiated larvae for oral administration.