

Genus : Strongylus

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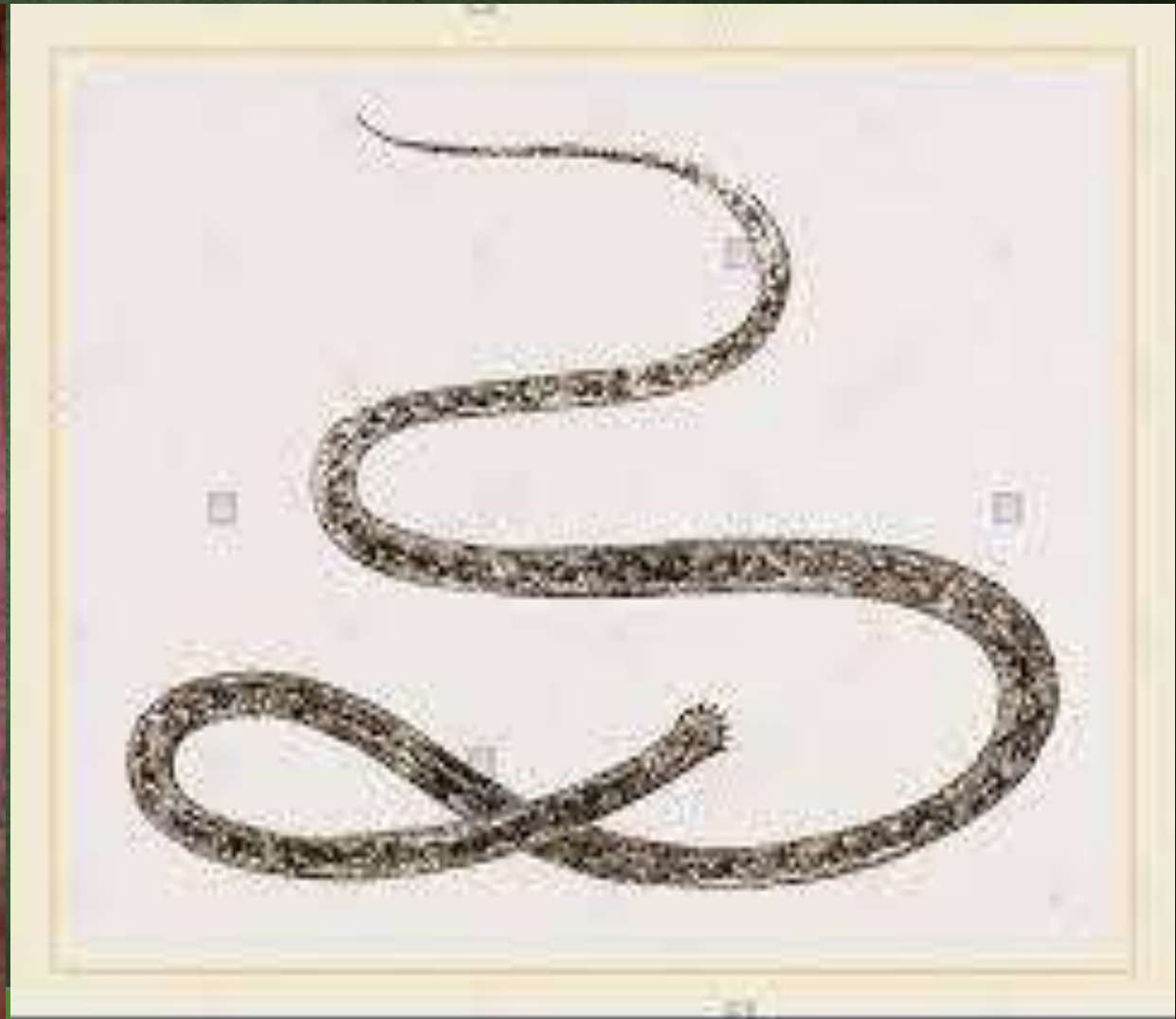
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Strongylus : Morphology

- The worms called as 'Large Strongyles' or 'Red worms' of equines. The red colour is due to ingested blood.
- There are 3 different main species: *Strongylus vulgaris* is up to 25 mm long, *Strongylus edentatus* up to 40 mm, and *Strongylus equinus* up to 50 mm.
- Female worms are longer than male worms.
- The body of these worms is covered with a cuticle, which is flexible but rather tough.
- The worms have a tubular digestive system with two openings.
- All species have a characteristic well formed, rather spherical buccal capsule equipped with basal teeth to cut the host's tissues.
- They feed on blood and tissues of the organs they migrate through. These worms are so-called plug feeders.



Strongylus spp.

Strongylus : Life cycle

- The adults worms are primarily found in the cecum and colon of infected horse.
- The females worms lay their eggs. These eggs pass out of the horses body in the feces.
- In the environment the eggs hatching occurs and develop into the infective larval stage L3.
- At the time of grazing the infective larvae enter the host, migrates to the small intestine where it can enter the intestinal mucosa and further develop into the L4 stage.
- In this stage the larva can enter the blood vessels and migrate throughout the body for a period of up to six months.
- During this time the L4 stage matures into the L5 or immature adult stage before returning to the intestinal wall.
- The L5 stage resides primarily in the cecum and colon where the males and females copulate thus starting the cycle over again.

Strongylus : Life cycle ...contd 2

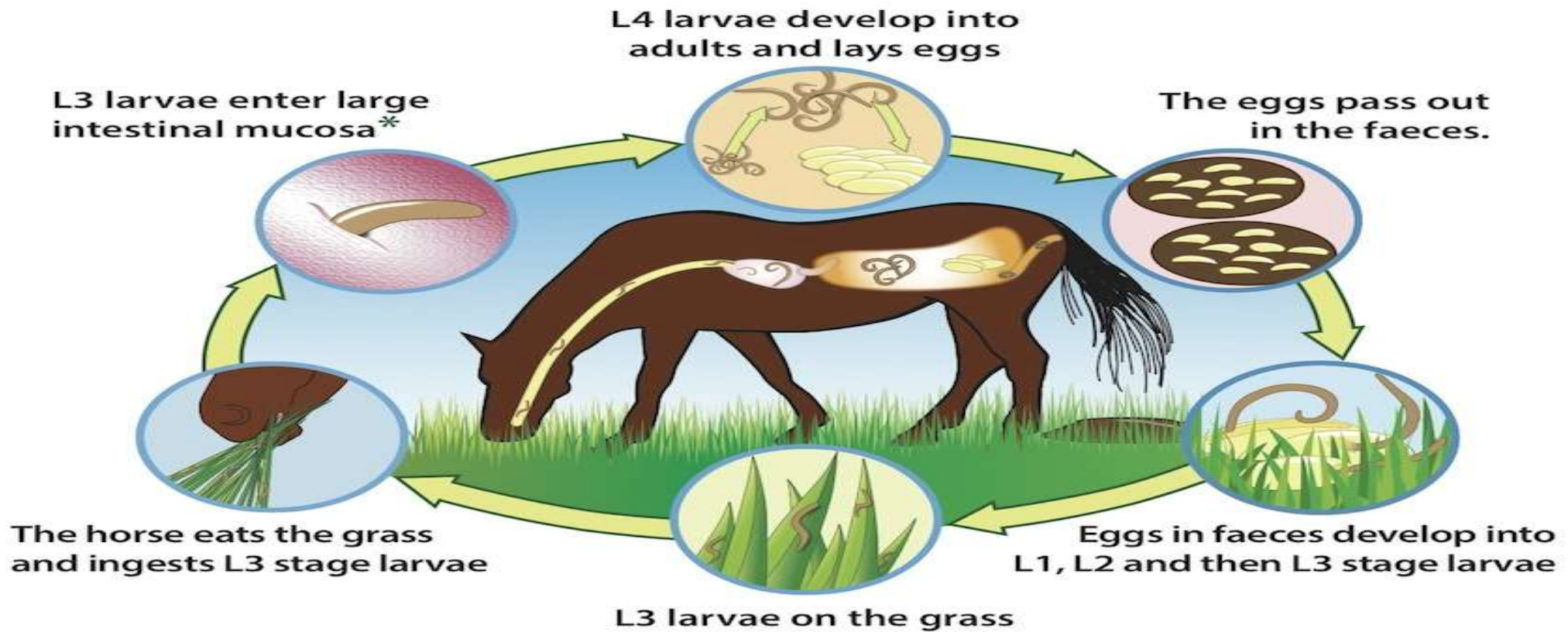
- After ingestion of infective L3-larvae the life cycle and behavior is species-specific.
- *Strongylus vulgaris*.-Infective larvae L3 after ingestion, penetrate in the wall of cecum and colon, migrate against the blood flow during about 2 weeks until they reach the cranial mesenteric artery. There they remain for about 4 months moult to L4, then migrate back to the intestine cross the gut's wall, complete development to adult worms in the lumen of the intestine.
- *Strongylus edentates* -Infective larvae L3 after ingestion, penetrate in the wall of cecum and colon, but instead of migrating to the cranial mesenteric artery, they reach the liver through the portal vein. There they remain for about 2 months, cause the appearance of nodule then migrate to the peritoneum, where they also induce nodule formation. Subsequently they migrate further to the large intestine, where moult to L4, and form nodules.

Strongylus : Life cycle...contd 3

These nodules rupture and the adult worms reach the gut's lumen where they start laying eggs, almost a year after being ingested.

- *Strongylus equinus*.- Infective larvae L3 after ingestion reach the small intestine, burrow into the submucosa of its wall, forms nodules and moult to L4-larvae, then migrate within the gut's wall and reach to the peritoneal cavity, then penetrate into the liver, migrate to the pancreas or other abdominal organs and finally in large intestine. There they reach maturity and start producing eggs.

Life Cycle of Small Strongyle in Horses



Strongylus : Life cycle

Strongylus : Clinical signs

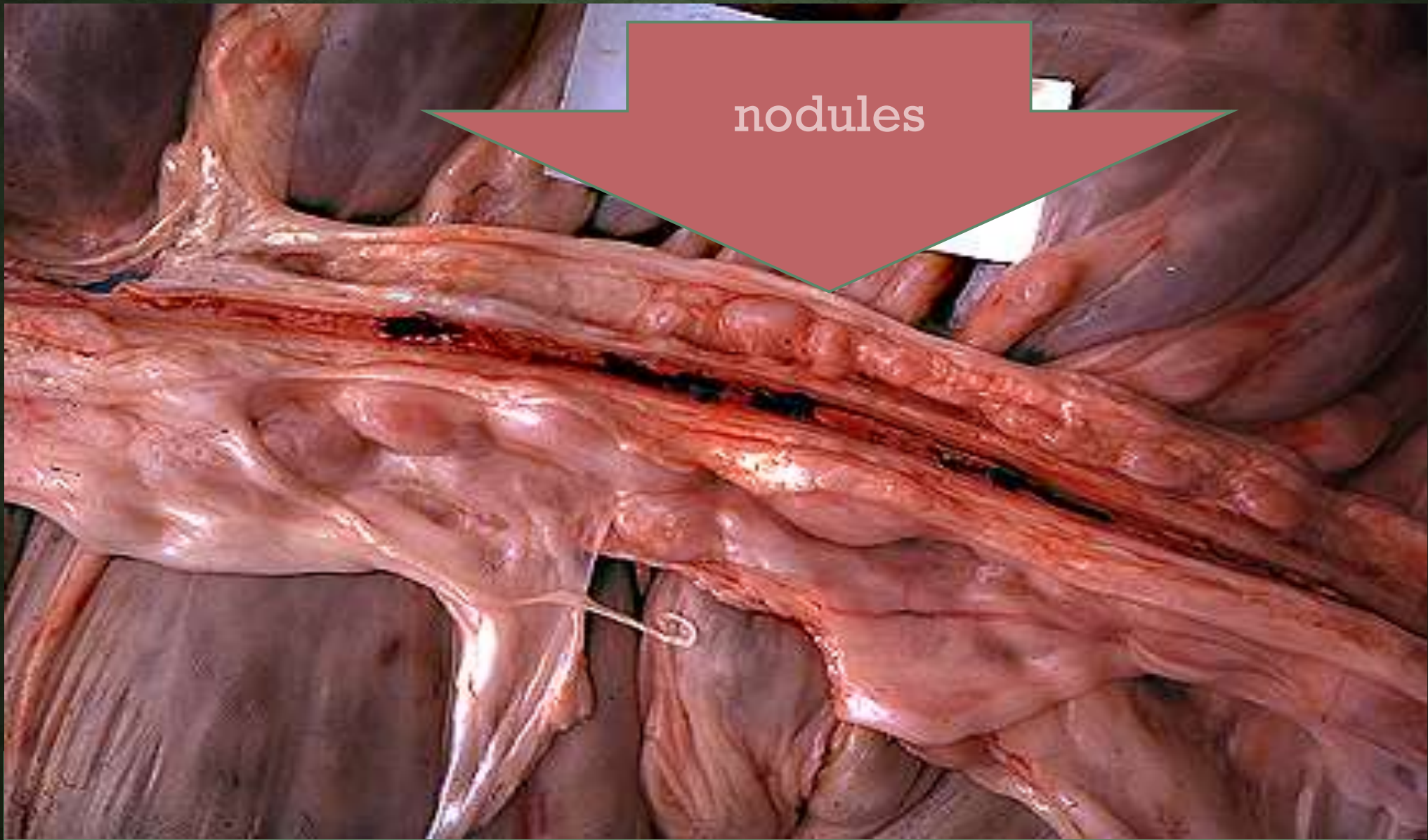
- Clinical signs depending on severity of the infection.
- In mild infections the most common clinical signs are weightless and a dull hair coat.
- Other clinical signs are diarrhea, weakness, anorexia, abdominal discomfort and anemia if there are significant blood loss.
- More severe cases can show signs of having severe colic, rupture of the intestines, and death.
- Sometimes in severe cases gangrenous **enteritis**, **intestinal stasis** , rupture and intestinal infarct may also happen.

Strongylus : Pathogenesis

- They are most harmful, adult worms as well as the migrating larvae are pathogenic.
- Both young and adult horses can be affected, but young horses are most susceptible.
- Larvae in the blood vessels damage their walls, which leads to **verminous arteritis**. Wall damage causes hemorrhage favoring clotting. Some clots break off, transported and may obstruct the blood flow (thrombosis).
- Thrombosis if affects the hind limbs increasing weakness up to lameness with trembling and sweating.
- In severe cases atrophy of the hind limb muscle may occur, as well as occlusion of the distal aorta, with acute paralysis and recumbency.

Strongylus : Pathogenesis

- Affected animals are painful showing anxiety and shock symptoms.
- Aneurysms may also occur. In some cases such aneurysms can suddenly burst and resulting into fatal condition.
- Adults of *Strongylus edentatus* and *Strongylus equinus* are less pathogenic, But migrating larvae of *Strongylus vulgaris* are highly pathogenic than the adult.
- Adult horses that have been exposed to *Strongylus spp* infections develop natural immunity against these worms.



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Strongylus : formation of nodules

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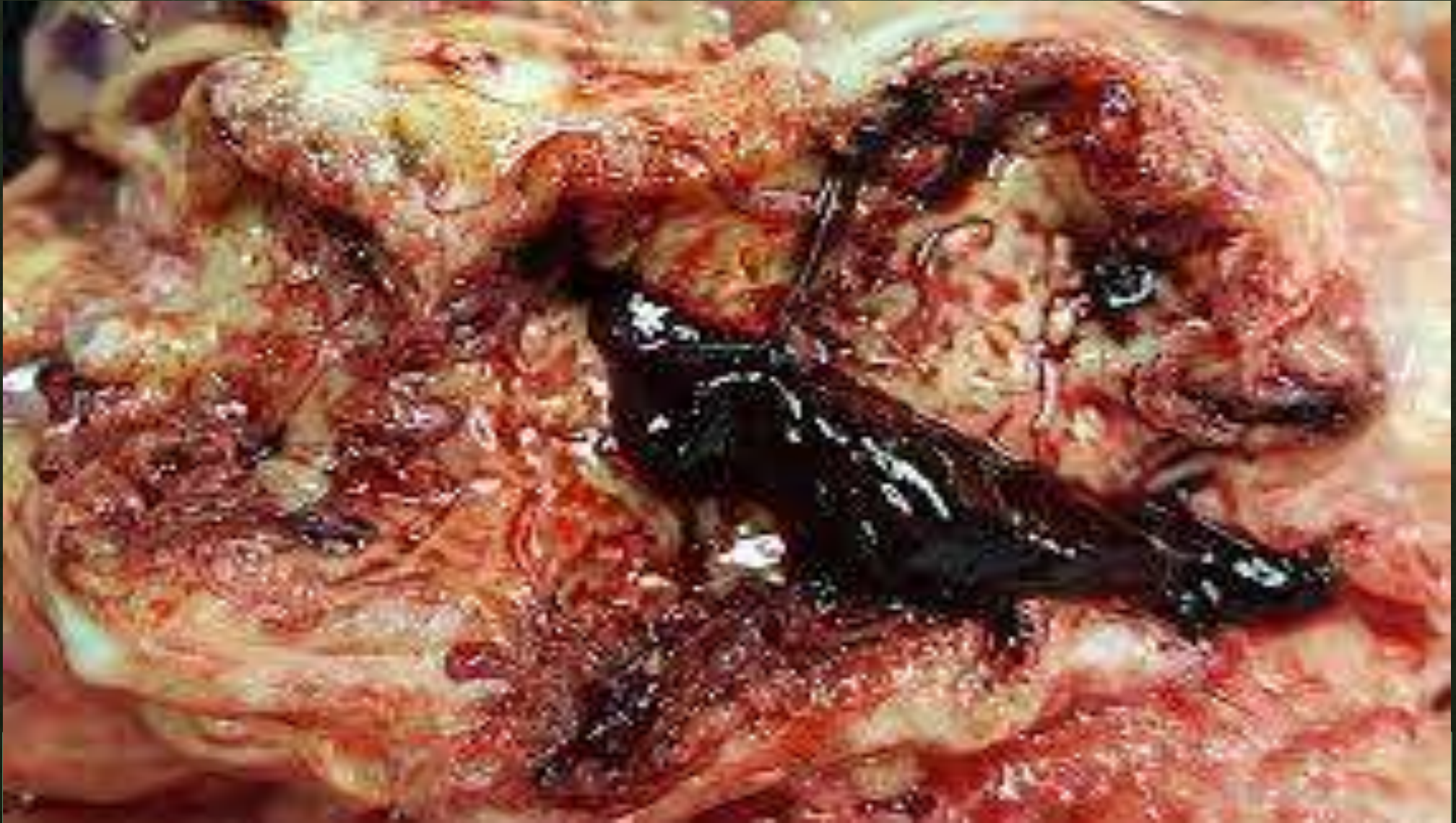


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Strongylus edentatus

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Strongylus vulgaris

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Strongylus in horse

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Strongylus in horse

Strongylus : Diagnosis

- Faecal examination for detection of typical eggs in the faeces.
- Coproculture technique for isolation of larvae.

Strongylus : Prevention & control

- An important measure is to avoid overstocking of pastures.
- The humid pastures should be drained, it lower the survival of infective larvae.
- To prevent infestations stable hygiene is essential. They must be regularly cleaned, manure has to be removed daily and the bedding must be changed regularly.
- Horses coming into a farm must be always checked for pre-existing infections or treated with a broad-spectrum anthelmintic before they are allowed to share pastures and premises with other horses.