SPECIFIC DISEASES OF SHEEP AND GOATS

Diseases caused by bacteria

Black quarter (Black leg)

Black quarter is an acute infectious disease of sheep and cattle manifested by inflammation of the muscles, toxaemia and high mortality. It is caused by Clostridium chauvoei.

Transmission : Contaminated soil. The organisms enter into the digestive tract with feed and through cuts which occur during the shearing, docking, and castration, and via naval infection during birth. Infection of the vulva and vagina of the ewes during lambing may cause serious outbreak of the disease. Black leg is worldwide in distribution. Well-nourished and grass fed animals are more often affected.

Antemortem findings :

1. Fever
2. Loss of appetite
3. Depression
4. Stiff gait and reluctance to move due to lameness
5. Subcutaneous edema is not common.
6. Gaseous crepitation occurs before death.
7. Head lesions associated with edema and nose bleeding

Postmortem findings :

1. Subcutaneous edema particularly noted around head.
2. Affected muscle is dark brown, dry and sponge like or moist. A pungent odour is noted. Less gas is formed than in cattle.
3. Tongue, heart muscle and/or diaphragm may be blackish red. Marked abdominal extension if fetus is infected.
4. Genital tract lesions in the walls of the vagina and occasionally uterus
5. Serosanguineous and haemorrhagic fluid in body cavities and pericardial sac
6. Edema of lungs

Judgement : *Total condemnation* of the carcass and viscera of an animal affected with black leg. It is prohibited to slaughter and dress the animal diagnosed with this disease on antemortem examination.

Differential diagnosis : Other acute Clostridial infections, lightning strike, anthrax, bacillary haemoglobinuria, malignant edema, extensive haemorrhage, acute lead poisoning and lactation tetany

Enterotoxaemia (Pulpy kidney)

This disease is a fatal toxaemia in lambs, sheep, goats, calves and seldom in adult cattle. The disease is manifested by diarrhoea, involuntary contraction of muscles, paralysis and sudden death. It occurs after a sudden change to a better, more nutritious diet. The disease is often noted in sheep that have been fed heavy grain, and in animals which graze on lush growing pastures. *Clostridium perfringens* multiplies in abomasum and intestine and produces toxin which paralyses the vital centres in brain and damages endothelium of blood vessels. The disease occurs extensively in particular in Southern Africa but is well controlled by vaccination.

Antemortem findings :

1. Short course of the illness (2 – 12 hours) in lambs and longer course (24 hours) in sheep
2. Animal found dead without previous sign of the disease
3. Dullness and depression
4. Rapid shallow respiration
5. Loss of appetite and frothing
6. Muscular contractions
7. Green pasty diarrhoea
8. Grinding of the teeth and muscular tremor
9. Logging behind the flock
10. Staggering and recumbency

Postmortem findings :

1. No lesions in peracute cases
2. Large amount of clear, straw coloured pericardial fluid
3. Petechial haemorrhages of the heart muscle
4. Congestion of the abomasal and intestinal mucosa (Fig. 163) and liver
5. Soft pulpy kidneys a few hours after death is characteristic of this disease
6. Overload of the rumen and abomasum with concentrate
7. Haemorrhage and edema in sheep brain
8. Rapid decomposition of the carcass

Judgement : Carcass of an animal affected with enterotoxaemia is *condemned*.

Differential diagnosis : Sudden death in lambs: pasteurellosis, hypocalcemia and hypomagnesemia (reduced blood calcium and magnesium), polioencephalomalatia (less acute form), acute rumen impaction (no convulsions are present and the course is longer) and other septicemias. Adult sheep: rabies, acute lead poisoning, pregnancy toxaemia and louping-ill

Fig. 163: Enterotoxaemia (pulpy kidney). Dilated intestine showing a patchy congestion. Note also congestion of mesenteric lymph nodes.

Infectious necrotic hepatitis (Black disease)

Black disease causes acute necrotic hepatitis in sheep and cattle and rarely in pigs. It is caused by bacterium *Clostridium novyi* in association with immature fluke invasion of the liver.

Antemortem findings :

1. Fever (40 – 42°C)
2. Rapid and shallow respiration
3. Sheep may be found dead without clinical signs.
4. Sick animal usually segregates from the rest of the flock.
5. Depression and incoordination
6. Recumbency

Postmortem findings :

1. Dark brown swollen liver showing necrotic areas surrounded by a zone of hyperaemia (Fig. 164)

2. Evidence of recent infestation of liver flukes
3. Darkened and cyanotic subcutaneous tissue due to small blood vessel engorgement (dark appearance of the skin). The name “Black disease” was derived from this.
4. Clear straw coloured fluid in the abdominal and thoracic cavities and in the pericardial sac

Clostridium novyi is an endemic environmental contaminant and remains latent in the liver, spleen and bone marrow. Immature liver flukes, by migrating through the liver, cause liver necrosis. This initiates Cl. novyi spores to germinate and proliferate. Necrotizing and haemolytic toxins are produced which cause generalized toxaemia and haemolysis of the blood.

Judgement : Carcass and viscera affected with black disease are *condemned*.

Differential diagnosis : Fascioliasis, enterotoxaemia, blackleg, malignant edema anthrax

Fig. 164: Black disease. Dark brown swollen liver showing necrotic areas (1–2 cm) in diameter surrounded by a zone of hyperaemia.

Anthrax

Anthrax is a peracute disease of ruminants manifested with septicemia, sudden death and tarry blood from the body openings of the cadaver. It is caused by *Bacillus anthracis*.

Transmission: Man may contract anthrax by inhalation, ingestion and through a wound in the skin. Biting flies have been shown to be transmitters.

Antemortem findings:

The peracute and acute forms in cattle and sheep are without clinical signs. Death may follow in the acute form after 1 – 2 hours of illness. The acute form lasts about 48 hours.

In pigs and horses this disease is usually localized and chronic and is often characterized by swelling around the throat and head.

Antemortem findings in pigs:

1. Incubation 1 – 2 weeks
2. Edematous swelling of the throat and neck
3. Swallowing and breathing difficulties
4. Death due to choking or toxaemia
5. Septicemia is not observed.

Postmortem findings:

1. Dark-tarry blood discharge from body orifices
2. Absence of rigor mortis
3. Haemorrhage of the mucous and serous membranes, lymph nodes and subcutaneous tissue
4. Enlarged spleen
5. Severe haemorrhagic enteritis
6. Degeneration of the liver and kidneys
7. Bloating and rapid decomposition of carcass
8. Localized lesions in the intestine of pigs (dysentery)

Diagnosis of anthrax is carried out by direct microscopic examination of tissues and fluids (Fig. 73).

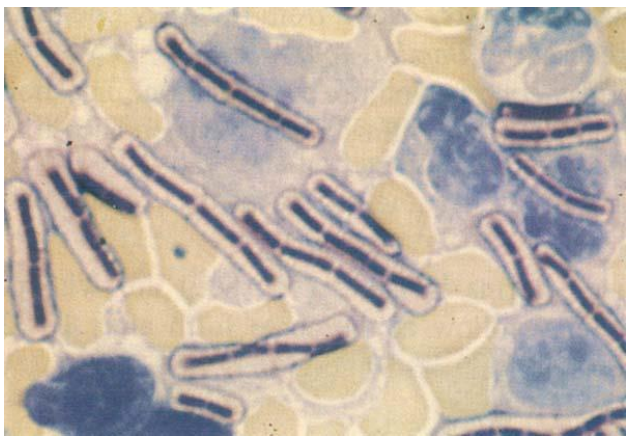

Fig. 73: Anthrax. Toluidine blue stain. Bacillus anthracis in a bovine spleen. Anthrax bacilli in tissue seen in short chains surrounded by a common capsule.

Judgement: *Condemnation* of the carcass and its parts by burning or burial. If disposed by burial, the carcass should be buried at least 6 feet below ground. The site should be surrounded by a foot thick layer of quicklime.

Differential diagnosis: Peracute blackquarter and septicaemic form of other diseases. In splenic enlargement as seen in babesiosis, anaplasmosis and leucosis, spleen consistency is firm. In anthrax, the spleen is soft and upon incision the pulp exudes like thick blackish-red blood.

Diseases caused by protozoa

Toxoplasmosis

Toxoplasmosis is a contagious disease of animals and man caused by protozoon *Toxoplasma gondii*. It is found most frequently in pigs and sheep. Toxoplasma in sheep is manifested with abortion and stillbirths in ewes.

Life cycle : see Fig. 147

Antemortem findings:

1. Abortion and stillbirths in ewes
2. Fever
3. Generalized tremor
4. Difficult breathing

The systemic disease is seldom found in sheep.

Postmortem findings:

1. Multiple granulomatous lesion in the lungs
2. Hydrothorax
3. Ascites
4. Intestinal ulceration
5. Necrosis in the liver, spleen and kidneys
6. Necrosis of placenta
7. Brain haemorrhage, edema and ventricular dilatation (Fig. 176)
8. Inflammation of the brain (Fig. 177)

Judgement: Carcass of an animal showing clinical signs of acute disease is *condemned*. Recovered and reactor animals are *approved*.

Differential diagnosis:

Abortion in ewes: brucellosis, campylobacteriosis, listeriosis, salmonellosis and Rift Valley fever

Brain lesions: salt poisoning, chlorinated hydrocarbons, lead, mercury, Vitamin A deficiency, hypoglycaemia, encephalomalacia, meningitis, rabies and scrapie

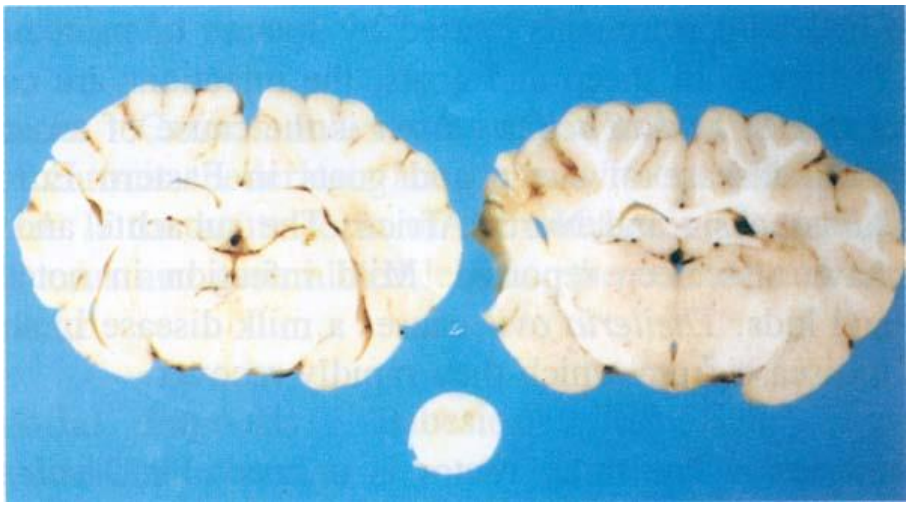

Fig. 176: Toxoplasmosis. Brain haemorrhage, edema and ventricular dilatation. The specimen was fixed in 10% formalin solution.

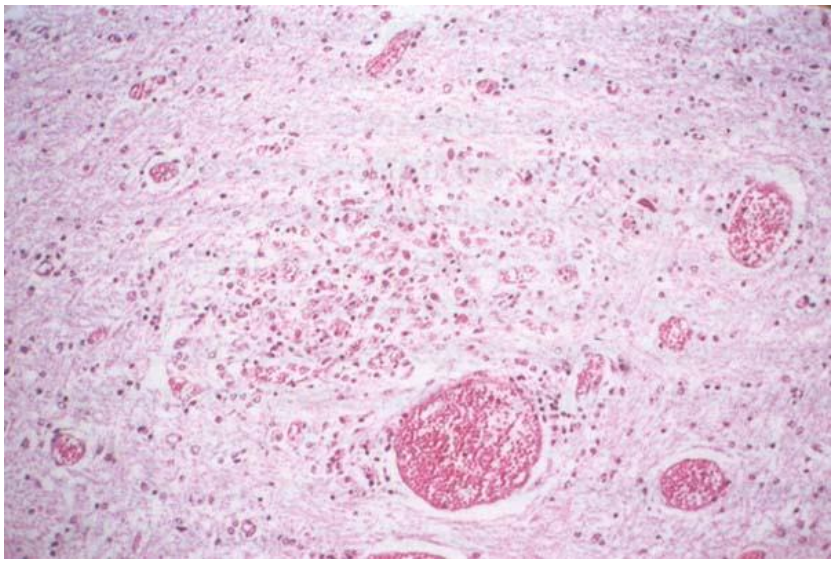

Fig. 177: Toxoplasmosis. Inflammation of the brain (encephalitis). Tachyzoites are distributed throughout the brain where they encysts and produce bradyzoites.