

Goat coccidia

Numerous species of *Eimeria* are found in goats worldwide but *E arloingi*, *E. ninakohlyakimovae*, and *E christenseni*, are highly pathogenic in **kids**. The *Eimeria* spp are host specific and are not transmitted from sheep to goats. Clinical signs include diarrhea with or without mucus or blood, dehydration, emaciation, weakness, anorexia, and death. Some goats are actually constipated and die acutely without diarrhea.

- *Eimeria ninakohlyakimovae* (**Second most pathogenic**)
- *Eimeria alijeви* (**Smallest species**)
- *Eimeria arloingi* (**Most pathogenic and schizont stage found in the epithelial cells of lacteals of villi**)
- *Eimeria aspheronica*
- *Eimeria caprina*
- *Eimeria caprovina*
- *Eimeria christenseni* (**Largest species**)
- *Eimeria hirci*
- *Eimeria jolchijevi*
- *Eimeria (Globidium) gilruthi*, is responsible of incidental infections of the **abomasums** in sheep and goat (Globidial schizont/ largest schizont visible in small intestine)

EIMERIA ARLOINGI

- Host: Goat
- Location: Small intestine

Epidemiology

- Management factors associated with the development of high levels of infection and the development of disease are overcrowding, dirty conditions and repeat use of rearing pens for different age groups of young goats.
- If the same pens are used constantly for successive batches, or if young goats are added to a pen already housing older animals, then the later born animals are immediately exposed to heavy challenge and can show severe coccidiosis in the first few weeks of life.

- On heavily stocked, overgrazed pastures levels of contamination may be high, leading to disease.

Morphology

- Oocysts are ellipsoidal, 27 X 18 μ .
- Micropyle and micropylar cap are present.
- Polar granules and sporocystic residuum are present.
- Sporulation time is 3 days.
- Lambs and kids of 2- 4 months are mostly affected. This is common in intensive system of rearing
- Incubation period is 13 days
- Prepatent period is 19 days.
- Two generations of schizogony are observed. First generation schizont is a giant schizont(megaloschizonts)

Pathogenesis

- Papilloma-like lesions or polyps may occur in the small intestine, usually as a sequel to gametocyte formation, but these are not of great pathogenic significance.

Pathology

- A few small, slightly haemorrhagic areas are seen scattered throughout the lining of the small intestine and thick, white, opaque patches made up of groups of heavily parasitised villi are present leading to the formation of polyps

symptoms

- Abdominal pain
- Watery faeces and occasionally blood tinged mucus
- Emaciation

Diagnosis

- Diagnosis is based on the management history, postmortem lesions and faecal examination for oocysts.

Treatment and control

- Few drugs are available for the treatment of coccidiosis in goats but sulphonamides, decoquinate or diclazuril may be effective if disease is suspected.
- The incidence of infection can be reduced through avoidance of overcrowding and stress, and attention to hygiene.

Sheep coccidia

Infection with *Eimeria* is one of the most economically important diseases of sheep (**Especially in lamb**). Historically, some *Eimeria* spp were thought to be infectious and transmissible between sheep and goats, but the parasites are now considered host-specific. Signs include diarrhea (sometimes containing blood or mucus), dehydration, fever, inappetence, weight loss, anemia, wool breaking, and death. The ileum, cecum, and upper colon are usually most affected and may be thickened, edematous, and inflamed; sometimes, there is mucosal hemorrhage.

- *Eimeria crandallis*
- *Eimeria ovinoidealisis*
- *Eimeria ahsata* (**Most pathogenic**)
- *Eimeria bakuensis*
- *Eimeria faurei*
- *Eimeria granulosa* (**Urn shaped oocysts**)
- *Eimeria intricata* (**Largest species**)
- *Eimeria marsica*
- *Eimeria parva* (**smallest species**)
- *Eimeria pallida*
- *Eimeria weybridgensis*,
- *Eimeria crandallis*
- *Eimeria ovinoidealisis*

Epidemiology

- In spring-lambing flocks in western Europe, infection of lambs results both from oocysts, which have survived the winter and from those produced by earlier born lambs.
- Lambs are usually affected between 4 and 8 weeks of age with a peak infection around 6 weeks.

- The outbreaks reported have occurred where ewes and lambs were housed in unhygienic conditions or grazed intensively.
- The feeding of concentrates in stationary troughs, around which heavy contamination with oocysts has occurred, can also be a precipitating factor.
- Coccidiosis occurs when older lambs are confined in feedlots after weaning.

Pathogenesis

- The most pathogenic species of coccidia are those that infect and destroy the crypt cells of the large intestinal mucosa.
- This is because the ruminant small intestine is very long, providing a large number of host cells and the potential for enormous parasite replication with minimal damage.
- If the absorption of nutrients is impaired, the large intestine is, to some extent, capable of compensating.
- Those species that invade the large intestine are more likely to cause pathological changes, particularly if large numbers of oocysts are ingested over a short period of time. Here, the rate of cellular turnover is much lower and there is no compensation effect from other regions of the gut.
- In lambs or kids that become heavily infected, the mucosa becomes completely denuded resulting in severe haemorrhage and impaired water resorption, leading to diarrhoea, dehydration and death.
- In lighter infections, the effect on the intestinal mucosa is to impair local absorption. Species that develop more superficially in the small intestine cause a change in villous architecture with a reduction in epithelial cell height and a diminution of the brush border, giving the appearance of a '**flat mucosa**'.
- These changes result in a reduction of the surface area available for absorption and consequently a reduced feed efficiency.

Clinical signs

- Clinical signs vary from loss of pellet formation to weight loss, anorexia and diarrhoea (with or without blood)
- Lowered feed intake.
- Poor absorption of nutrients.
- Dehydration.

Pathology

- On postmortem, there may be little to see beyond thickening and petechiation of the bowel but mucosal scrapings will reveal masses of gamonts and oocysts. Giant meronts may be seen in the mucosa of the small intestine as pin-point white spots but unless they are in vast numbers they cause little harm. The most pathogenic stages are the gamonts

Diagnosis

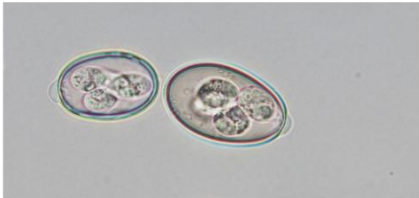
- Diagnosis should be based on history, clinical signs (severe diarrhoea in young animals), postmortem findings (inflammation, hyperaemia and thickening of caecum with masses of gamonts and oocysts in scrapings) supported by oocyst counts and speciation to identify pathogenic species.
- Counts of faecal oocysts identified to species can help to complete the picture, but oocyst numbers may be grossly misleading when considered in isolation.
- Healthy animals may pass more than a million oocysts per gram of faeces, whereas in animals dying of coccidiosis the count may be less than 10 000.
- High counts of nonpathogenic species could mask significant numbers of the more pathogenic species, for instance, and give the impression that the abundant species was the cause.

Treatment and control

- Decoquinate and diclazuril are the drugs generally used for the prevention and treatment of these infections.
- Monensin and amprolium have also been used in some countries for coccidiosis prevention.
- Several sulphonamides, such as sulphadimidine, sulphamethoxypyridazine, sulphadiazine, sulphadoxine and sulphatroxazole, can also be used for the treatment of infected animals.
- All animals in a group should be treated and dehydrated animals may require oral or intravenous rehydration.
- Where non-specific symptoms of weight loss or ill-thrift are present, it is important to investigate all potential causes and seek laboratory confirmation.

- Good management and hygiene practices, by regular moving of feed and water troughs, avoidance of overcrowding and stress, batch rearing, feeding of dams prior to parturition

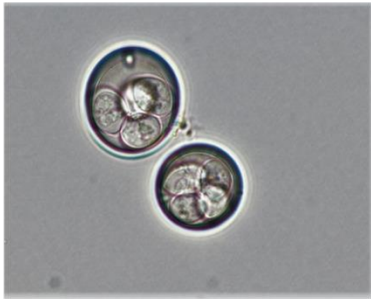
Case Report: **Clinical coccidiosis in kids**



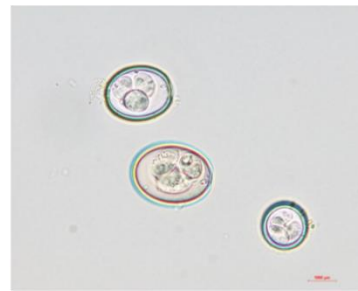
E. arloingi and *E. christenseni*



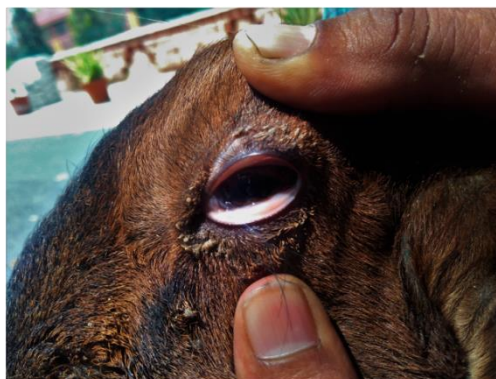
E. hirci and *E. ninakohlyakimovae*



E. alijevi and *E. ninakohlyakimovae*



E. alijevi, *E. caprovina*
and *E. ninakohlyakimovae* (100X)



Coccidia infected kids

