

## Coccidiosis in Cattle and buffaloes

Coccidiosis is commonly a disease of **young cattle** (1–2 mo to 1 yr) and usually is sporadic during the wet seasons of the year. “Summer coccidiosis” and “winter coccidiosis” in range cattle probably result from severe weather stress and crowding around a limited water source, which concentrates the hosts and parasites within a restricted area. Twelve *Eimeria* spp have been identified in the feces of cattle worldwide, but only three (*E zuernii*, *E bovis*, and *E auburnensis*) are most often associated with clinical disease. The other *Eimeria* spp have been shown experimentally to be mildly or moderately pathogenic but are not considered important pathogens.

### Important species affecting cattle and buffaloes

- Cattle
  - *Eimeria alabamensis* (**Intranuclear parasite of the intestinal epithelium cell**)
  - *E.auburnensis*
  - *Eimeria bukidnosis* (**Biggest species**)
  - *E.bovis* (**Commonest and second most pathogenic species and giant schizont in the small intestine**)
  - *E.brasiliensis* (**Capped Eimeria species**)
  - *E.canadensis*
  - *E.cylindrica*
  - *E.ellipsoidalis*
  - *E.pellita*
  - *E.subspherica* (**smallest**)
  - *E. zuernii* (**Most pathogenic**)
- Buffalo
  - *Eimeria ankarensis*
  - *E.bareillyi* (**most pathogenic**)
  - *E.gokaki*
  - *E.ovoidalis*
  - *E.thianethi*

## ***EIMERIA ZUERNII***

- This is very common coccidia of cattle and buffalo calves, **4-18** months are mostly affected. Disease is called **Red dysentery or Winter coccidiosis**.
- Oocysts are spherical or sub spherical 18x16  $\mu$
- Micropyle is absent. Oocyst wall is thin, transparent with homogenous polar granule. Oocystic and sporocystic residual bodies are absent.
- Sporulation time is 48-72 hrs

### **Location**

- Schizogony occurs in lower small intestine and caecum.
- Gametogony is seen in rectum.
- Incubation period is 7-10 days and prepatent period is 19-20 days.

### **Epidemiology**

- More than one asexual generation is seen Disease is dependent on conditions, which precipitate a massive intake of oocysts, such as overcrowding in unhygienic yards or feedlots. It may also occur at pasture where livestock congregate around water troughs

### **Pathogenesis**

- *E.zuernii* is an acute infection and most pathogenic coccidia of cattle
- Bloody diarrhoea in calves.
- Diarrhoea becomes more severe, bloody fluid, clots of blood, lipid faeces (steatorrhea) straining and coughing may cause the mixture to spurt out to 6-8 ft.
- Dysenteric faeces will be matted in perineum. Anaemia, weakness, emasciation accompany dysentery. Secondary infection especially pneumonia are common. This acute phase lasts for 3-4 days. Calves may recover or die. In chronic case, the diarrhoea will be seen. Emaciation, dehydration, weakness, rough coat, drooping of ear, sunken eyes are the other signs.

### **Lesion**

- Generalised catarrhal enteritis is observed.

- The affected portion is filled with semi- fluid material with blood.
- Ulcers are seen.

### **Clinical signs**

- In acute infections, *E. zuernii* causes haemorrhagic diarrhoea of calves. At first, the faeces are streaked with blood, but as the diarrhoea becomes more severe, bloody fluid, clots of blood and liquid faeces are passed.
- Tenesmus and coughing can result in the diarrhoea being spurted out up to 2–3 m. The animal's hindquarters are smeared with red diarrhoea.
- Secondary infections, especially pneumonia, are common. The acute phase may continue for 3–4 days. If the calf does not die in 7–10 days, it will probably recover. *E. zuernii* may also cause a more chronic form of disease.
- Diarrhoea is present, but there is little or no blood in the faeces. The animals are emaciated, dehydrated, weak and listless. Their coats are rough, their eyes sunken and their ears droop.

### **Diagnosis**

- History
- Symptoms and lesions
- Scraping from affected intestinal mucosa will reveal schizonts, merozoites, and developing stages

### **Treatment**

- Treatment of both the above pathogenic species of coccidia is with a sulphonamide, such as sulphadimidine or sulphamethoxypyridazine, given orally or parenterally and repeated at half the initial dose level on each of the next 2 days.
- Alternatively, decoquinate or a combination of amprolium and ethopabate may be used.

### **Control**

- Prevention is based on good management; in particular feed troughs and water containers should be moved regularly and bedding kept dry

## ***EIMERIA BOVIS***

- *Host:* Cattle and buffalo

### **Morphology**

- Bigger in size than *E.zuernii*; 28 x 20  $\mu$ , oval in shape.
- Micropyle present.
- Oocyst is coloured greenish to yellowish brown.
- Sporocystic residual body is present.
- Sporulation time is 48-72 hrs.

### **Location**

- Small intestine (schizogony) caecum, colon terminal ileum (gametogony).
- Only single asexual generation takes place.
- Mature schizont is visible to naked eye as whitish balls and is useful in the parasite identification.
- The incubation is 18 days and prepatent period is 21 days

### **Pathogenesis**

- Diarrhoea with blood.
- Tenesmus (straining) high temp 106<sup>0</sup>F, severe pathologic changes occur in colon and terminal ileum due to sexual stages.
- Congestion, oedema, thickening of mucosa with petechiae or diffused haemorrhages sloughing off mucosa.
- Coccidiosis in cattle infection with single species is rare.
- Bovine coccidiosis is a disease of young animals (3 weeks to 6 months)

### **Diagnosis**

- History
- Symptoms and lesions
- Scraping from affected intestinal mucosa will reveal schizonts, merozoites, and developing stages

## Treatment

- Sulphamezathine, mepacrine hydrochloride, amprolium

## Prevention

- Sanitation and Isolation

## Case report: **Clinical coccidiosis in calf**

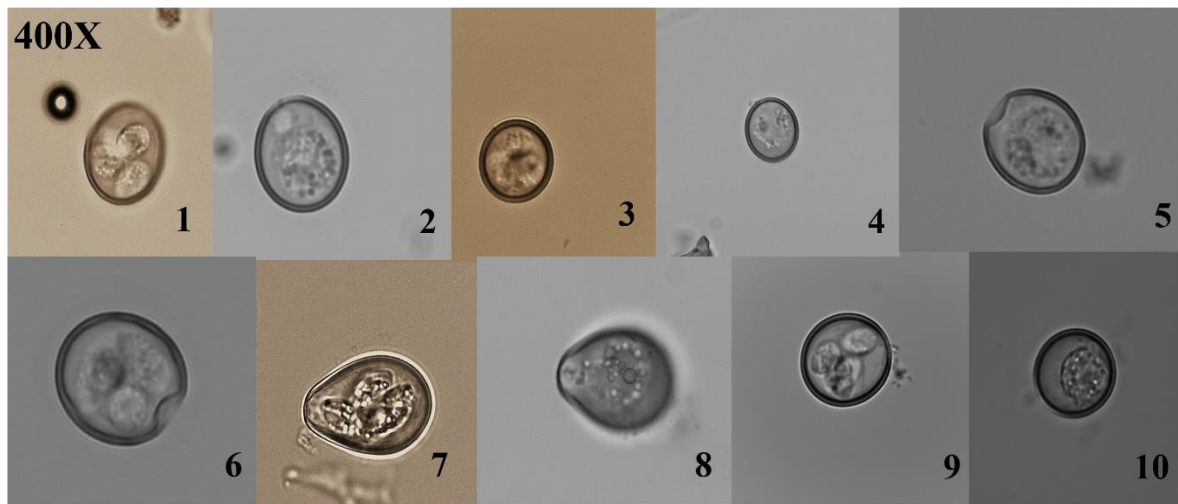


Fig 1: Oocysts of *Eimeria* species identified microscopically before and after sporulation 1. *Eimeria alabamensis* (sporulated), 2. *Eimeria alabamensis* (unsporulated), 3. *Eimeria subspherica* (sporulated), 4. *Eimeria subspherica* (unsporulated), 5. *Eimeria pellita* like (sporulated), 6. *Eimeria pellita* like (unsporulated), 7. *Eimeria bovis* (sporulated), 8. *Eimeria bovis* (unsporulated), 9. *Eimeria zuernii* (sporulated), 10. *Eimeria zuernii* (unsporulated).



Fig 2: Clinically affected calf a. Pale & congested mucus membrane, b. Prolapse of rectal membrane, c. Blood mix diarrhea, d. Frank haemorrhages on plastic gloves