

Therapeutic Management of *Buxtonella sulcata* Infection in a Crossbred Cow

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Parasitism represents a major constraint in livestock production systems, causing significant health issues that adversely affect animal welfare, performance, and economic viability (Khan *et al.*, 2023). Among parasitic infections, protozoan diseases hold particular importance in ruminant health management, with various intestinal protozoa responsible for diarrhoea and mortality in neonatal and adult bovines (Choubisa and Jaroli, 2013). *Buxtonella sulcata* is a ciliated protozoan that exists as environmental cysts and colonizes the colon of cattle in its vegetative form. While traditionally considered commensal, increasing evidence suggests its pathogenic potential in causing diarrhoeal episodes in ruminants (Omeragić and Crnkić, 2015). The organism's biological cycle involves two distinct stages: resistant cyst forms found in the environment and vegetative trophozoites that multiply in the host's colon through binary fission (Grim *et al.*, 2015). Infection occurs through ingestion of cysts via contaminated fodder or water, with subsequent trophozoite release in the terminal small intestine and colon (Tomczuk *et al.*, 2005). Clinical significance remains controversial, with sporadic reports from various geographical regions showing variable infection rates and pathogenic potential (Telu *et al.*, 2026). This case report documents the successful therapeutic management of *B. sulcata*-associated diarrhoea in a crossbred cow.

CASE HISTORY AND OBSERVATIONS

A lactating crossbred cow in second parity, weighing approximately 300 kg, was presented to the Veterinary Clinical Complex of the College, Khanapara (Guwahati, Assam, India) with a 20-day history of explosive mucoid diarrhoea and progressive loss of appetite. Previous treatment attempts with unspecified medications by a local veterinarian had proven unsuccessful.

Clinical examination revealed hyperthermia with body temperature of 104.2°F (40.1°C), tachycardia with heart rate of 84 beats/min, and tachypnea with respiratory rate of 32 breaths/min. Physical findings included mild dehydration and slightly pale mucous membranes, though no other significant abnormalities were detected. Haematological analysis showed parameters within normal ranges, with

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haemoglobin at 12.2 g/dL, packed cell volume at 52.60%, and red blood cell count at $7.91 \times 10^6/\text{cmm}$.

Fresh faecal samples were collected directly from the rectum using sterile containers and immediately transported for coprological examination. Native microscopic examination revealed the presence of both cyst and trophozoite forms of *Buxtonella sulcata* (Fig. 1). Identification was performed according to morphological criteria established by Lubinsky (1957). Importantly, no other parasitic agents were detected in the faecal samples, confirming *B. sulcata* as the sole causative agent responsible for the clinical manifestations.



Fig. 1: Microscopic field showing cyst of *Buxtonella sulcata* (40X magnification)

TREATMENT AND DISCUSSION

Based on established treatment protocols for *B. sulcata* infections (Hasheminasab *et al.*, 2015), a comprehensive therapeutic regimen was initiated. The primary treatment comprised oxytetracycline injection at 10 mg/kg body weight intravenously daily for five consecutive days. Supportive therapy included flunixin meglumine at 2.2 mg/kg body weight intramuscularly daily for three days to provide anti-inflammatory and analgesic effects, chlorpheniramine maleate 10 mL intramuscularly daily for five consecutive days as antihistamine support, and vitamin B-complex at standard dose intramuscularly daily for five days for nutritional support.

The patient showed progressive improvement throughout the treatment period with diarrhoea severity decreasing significantly and appetite gradually returning to normal levels. Faecal examination performed seven days post-treatment revealed complete absence of *B. sulcata* cysts and trophozoites, confirming parasitological cure. Two weeks post-treatment, marked clinical improvement was observed with complete resolution of diarrhoea and return to normal production parameters. Blood parameters returned to normal ranges during the recovery period, indicating successful therapeutic intervention and complete clinical recovery (Table 1).

Table 1: Pre-treatment and post-treatment values of blood parameters

Parameter	Haematology	
	Pre-treatment	Post-treatment
TLC ($\times 10^3/\text{mm}^3$)	9.8	8.5
Neutrophils (%)	48	42
Lymphocytes (%)	45	52
Monocytes (%)	5	4
Eosinophils (%)	2	2
Basophils (%)	0	0
Haemoglobin (g/dL)	12.2	13.5
PVC (%)	52.60	38.5
RBCs ($\times 10^6/\text{mm}^3$)	7.91	7.85
MCV (fL)	66.5	49.0
MCH (pg)	15.4	17.2
MCHC (g/dL)	23.2	35.1

Buxtonella sulcata represents one of the most common gastrointestinal protozoa in bovines across all age categories, seasons, sexes, and breeds (Maharana *et al.*, 2016). Unlike most ciliated protozoa that are considered commensal organisms involved in digestion, *B. sulcata* has been increasingly associated with clinical diarrhoea in cattle, suggesting its pathogenic potential (Omeragić and Crnkić, 2015; Telu *et al.*, 2026). The organism shows seasonal variation with higher infection rates during rainy seasons, particularly in cattle housed on muddy floors (Hasheminasab *et al.*, 2015). In a cattle calves population of 334, Telu *et al.* (2026) recorded the prevalence of *Buxtonella sulcata* as 0.60%.

B. sulcata infections are often misdiagnosed as *Balantidium coli* infections, emphasizing the importance of accurate morphological identification (Bhanot *et al.*, 2022). The presence of both cyst and trophozoite forms in this case facilitated definitive diagnosis. Oxytetracycline was selected as the primary therapeutic agent due to its proven broad-spectrum antibacterial and antiprotozoal activity against *B. sulcata*. The antibiotic inhibits parasitic growth by binding to the 30S ribosomal subunit, thereby preventing protein synthesis and disrupting the parasite's ability to reproduce, ultimately controlling the infection through interference with essential cellular processes.

Previous studies have demonstrated the effectiveness of oxytetracycline in treating *B. sulcata* infections, with several reports confirming its therapeutic efficacy (Kumar *et al.*, 2024). Alternative treatments using nitroimidazoles have also shown promise, though oxytetracycline remains the first-line therapy (Jamil *et al.*, 2015). *Buxtonella sulcata* infections, while often causing minor health problems, can significantly impact growth and productivity, resulting in substantial economic losses for farmers (Kumar *et al.*, 2024). This case demonstrates the successful therapeutic management of *B. sulcata*-associated diarrhoea in cattle using oxytetracycline-based therapy. The complete clinical recovery and parasitological clearance achieved within one week of treatment initiation highlight the efficacy of this therapeutic approach. Given the potential economic impact of *B. sulcata* infections, routine herd screening through microscopic faecal examination is recommended in regions where these infections are prevalent. Early diagnosis and prompt treatment can prevent complications and minimize production losses. *B. sulcata* should be considered in the differential diagnosis of bovine diarrhoea, particularly in cases where conventional bacterial or viral causes have been ruled out.

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