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Clinical insights of zoonotic cryptosporidiosis in dairy farm

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Abstract

Cryptosporidiosis is a contagious protozoan disease-causing diarrhea and reduced growth in dairy calves. It spreads through oocysts in contaminated feces, water, and housing environments. High calf density and poor hygiene increase infection risk. Effective control relies on sanitation, prompt isolation of sick calves, hydration support, and rigorous environmental management. This popular article summarizes all the clinical insights of this parasitic disease.

Keywords: Cryptosporidiosis, diarrhoea, dairy animals, clinical signs, control

Cryptosporidiosis is a protozoan disease caused by *Cryptosporidium spp.*, an obligate intracellular but extra cytoplasmic parasite infecting the gastrointestinal epithelium. The parasite completes its life cycle in one host and produces highly resistant, immediately infective oocysts. These survive for months in moist farm environments and resist many disinfectants, allowing persistent contamination of manure, bedding, feed utensils, water troughs, and soil making the disease a major One Health concern.

Transmission in dairy farms is mainly faeco-oral. Neonatal calves and kids (under three weeks) shed millions of oocysts, rapidly contaminating pens, buckets, and milk/colostrum equipment. Humans become infected by direct contact with sick calves, handling contaminated manure, ingesting contaminated water, or consuming unpasteurized milk. Farm workers, veterinarians, children, and immunocompromised individuals are at highest risk.

Clinically, calves and kids show profuse watery diarrhea, dehydration, poor weight gain, and mild abdominal pain, though mortality is usually low unless co-infections occur. In humans, infection causes watery diarrhea, abdominal cramps, nausea, fever, and dehydration; in immunocompromised patients (HIV/AIDS, chemotherapy), it may become chronic and severe with malabsorption and major weight loss. Young children and elderly people often face more serious outcomes.

[Fig.1 Diarrhoea in

Diagnosis relies on microscopic identification of oocysts using modified Ziehl–Neelsen acid-fast staining. Other stains (Kinyoun, auramine-O, Safranin–Methylene Blue) and modern tools ELISA, rapid antigen tests, immunofluorescence, PCR, and qPCR improve sensitivity and allow species detection. Water testing using filtration plus PCR supports surveillance. Treatment options are limited. In calves and kids, management is mainly supportive with fluids and electrolytes; halofuginone lactate (0.1 mg/kg once daily for 7 days) is the primary licensed drug. In humans, nitazoxanide is the only FDA-approved therapy and works best in immunocompetent individuals. New therapies like bumped kinase inhibitors and monoclonal antibodies are under research.

Control depends on strict hygiene: prompt manure removal, effective disinfectants (especially hydrogen-peroxide–based), dry bedding, clean pens, and avoiding overcrowding. Ensuring timely high-quality colostrum boosts calf immunity. For humans, handwashing, protective clothing, and avoiding raw milk are essential. Preventing water contamination is critical since Cryptosporidium is a major cause of waterborne outbreaks. One Health surveillance, farmer education, and strong biosecurity reduce transmission and protect both livestock productivity and community health.