Coccidiosis in Large and Small Ruminants

Sarah Tammy Nicole Keeton, PhD, MS[a,*], Christine B. Navarre, DVM, MS[b]

KEYWORDS

• Coccidia • Coccidiosis • Diarrhea • Ruminants • Cattle • Sheep • Goats
• Ionophores

KEY POINTS

- Coccidiosis is an important parasitic disease of ruminant livestock caused by the protozoan parasite of the genus *Eimeria*.
- Calves between 6 and 12 months of age and lambs and kids between 1 and 6 months of age are most susceptible.
- Subclinical disease is characterized by poor growth.
- Clinical disease is most commonly characterized by diarrhea.
- Control of coccidiosis is based on sound management, the use of preventive medications, and treatment of clinical cases as necessary.

INTRODUCTION: NATURE OF THE PROBLEM

Coccidiosis is a parasitic disease of vertebrate animals, including domestic ruminants.[1] It is economically significant, with losses from both clinical and subclinical disease.

Coccidiosis is caused by the protozoan parasite of the genus *Eimeria*. *Eimeria* are host specific, meaning that an *Eimeria* species that infect goats does not infect sheep or cattle and vice versa. Certain species of *Eimeria* are nonpathogenic and do not cause disease. The pathogenic species and sites of infection are listed in **Table 1**. Mixed infections with multiple pathogenic and nonpathogenic species is common.

LIFE CYCLE

Proper treatment and control of coccidiosis requires an understanding of the complex life cycle and transmission of *Eimeria* spp (**Fig. 1**). The life cycle can be divided into

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[a] Department of Veterinary Clinical Sciences, School of Veterinary Medicine, Louisiana State University, Skip Bertman Drive, Baton Rouge, LA 70803, USA; [b] LSU AgCenter, School of Animal Sciences, Louisiana State University, 111 Dalrymple Bldg, 110 LSU Union Square, Baton Rouge, LA 70803-0106, USA
* Corresponding author. 909 Durnin Drive, Denham Springs, LA 70726.
E-mail address: Sorlik1@lsu.edu

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Table 1
Pathogenic species of *Eimeria* and site of infestation in cattle, sheep, and goats

	Species of *Eimeria*	Site of Infestation
Cattle	*Eimeria zuernii*	Small and large intestine
	Eimeria bovis	Small and large intestine
	Eimeria alabamensis	Small and large intestine
Sheep	*Eimeria ovinoidalis*	Cecum and colon
	Eimeria crandalis	Small and large intestine
Goats	*Eimeria arloingi*	Small intestine
	Eimeria christenseni	Small intestine
	Eimeria ninakohlyakimovae	Small and large intestine

Data from Taylor MA, Coop RL, Wall RL. Veterinary parasitology. Fourth edition. Chichester (United Kingdom): Wiley Blackwell; 2016; and Chartier C, Paraud C. Coccidiosis due to *Eimeria* in sheep and goats, a review. Small Ruminant Res 2012;103(1):84–92.

2 phases: an exogenous phase (free living in the environment) and an endogenous phase (parasitic phase within host). The life cycle takes between 2 and 4 weeks to complete depending on the species of *Eimeria* and environmental conditions.[2]

In the exogenous phase of sporogony, unsporulated oocysts are excreted in feces and undergo sporulation under ideal environmental conditions of oxygen,

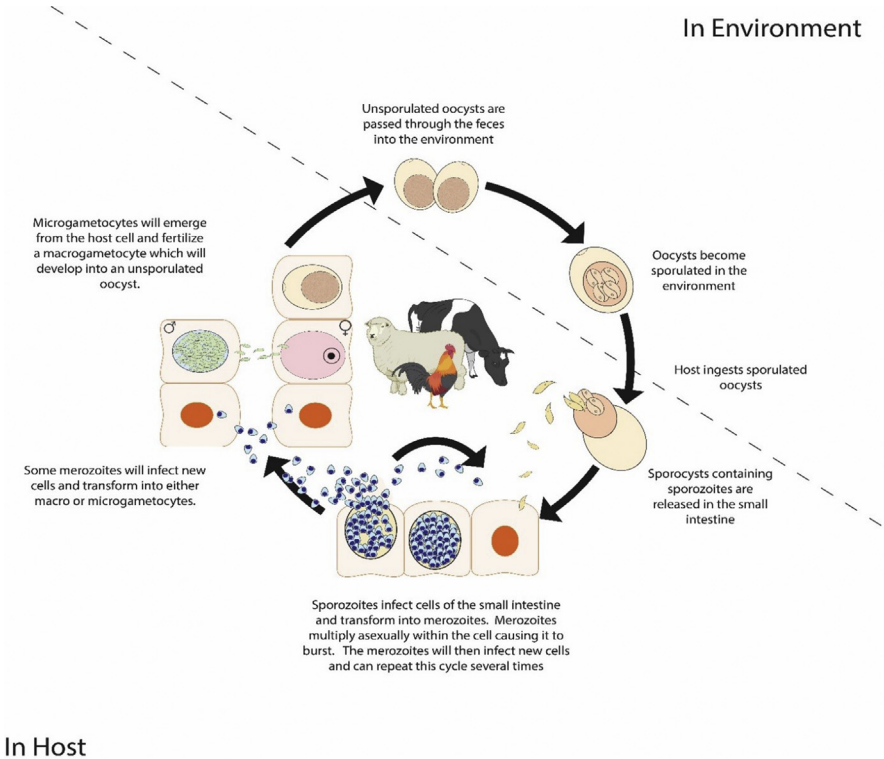

Fig. 1. *Eimeria* life cycle. (*From* Javier Garza, PhD, USDA-NIFA Fellow, Parasite Immunology, Division of Animal and Nutritional Sciences, West Virginia University, with permission.)