

Prevalence of *Eimeria* spp. Oocysts in dairy properties in Pelotas region in Rio Grande Do Sul, Brazil**Prevalência de Oocistos de *Eimeria* spp. Em propriedades leiteiras da região de Pelotas no Rio Grande Do Sul, Brasil**

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ABSTRACT

The South of Brazil has been occupying the first place in the ranking of milk production in the country and Rio Grande do Sul annually produces a total of 4.5 billion liters, positioning itself as the fifth largest producer in the country. These numbers could be better, were it not for the economic losses due to mortality, low productive performance and expenses, due to diseases such as coccidiosis. *Eimeria* penetrates the intestinal cells, multiplies, causing local lesions that impair digestive processes reducing the absorption of nutrients. The work aimed to carry out an epidemiological, retrospective survey of the prevalence of oocysts of *Eimeria* spp. on small dairy farms located in Pelotas region of RS. The results were obtained in the database of diagnoses performed in the laboratory of the Study Group on Parasitic Diseases (GEEP), at the Federal University of Pelotas (UFPel). Results from 505 stool samples were used. Fecal samples were analyzed using the Gordon and Whitlock technique (1939) and the result expressed in oocysts per gram of feces. Of the analyzed samples, 54.65% (276/505) were positive for oocysts of this genus, with an average count of 545 oocysts per gram of feces. It is concluded that this protozoan has a high prevalence in dairy farms located in the Southern region of RS.

Keywords: Coccidiosis, Diarrhea, Eimeriosis, Endoparasites

RESUMO

O Sul do Brasil vem ocupando o primeiro lugar no ranking de produção de leite no país e o Rio Grande do Sul produz anualmente um total de 4,5 bilhões de litros posicionando-se como o quinto maior produtor do país. Esses números poderiam ser melhores, não fossem as perdas econômicas devido mortalidade, baixo desempenho produtivo e gastos, em virtude de doenças como a coccidiose. *Eimeria* penetra nas células intestinais, multiplica-se, causando lesões locais que prejudicam processos digestivos reduzindo a absorção de nutrientes. O trabalho teve como objetivo realizar um levantamento epidemiológico, retrospectivo, da prevalência de oocistos de *Eimeria* spp. em pequenas propriedades leiteiras localizadas na região Sul do RS. Os resultados foram obtidos no banco de dados dos diagnósticos realizados no laboratório do Grupo de Estudos em Enfermidades Parasitárias (GEEP), da Universidade Federal de Pelotas (UFPel). Utilizou-se resultados de 505 amostras de fezes. As amostras fecais foram analisadas pela técnica de Gordon e Whitlock (1939) e o resultado expresso em oocistos por grama de fezes. Das amostras analisadas, 54,65% (276/505) foram positivas para oocistos deste gênero, apresentando média de contagem de 545 oocistos por grama de fezes. Conclui-se que esse protozoário tem alta prevalência nas propriedades leiteiras localizados na região Sul do RS.

Palavras-chave: Coccidiose, Diarreia, Eimeriose, Endoparasitos

1 INTRODUCTION

The southern region of Brazil has been occupying the first place in the country's milk production ranking since 2014. In 2017, the same region, that include Paraná, Santa Catarina and Rio Grande do Sul states, was responsible for 36% of national milk production. Annually, Rio Grande do Sul produces a total of 4.5 billion liters of milk, become the State as the fifth largest producer in the country, with approximately 13.0% of national production (EMBRAPA, 2019).

These data could be even better, if it not for the economic losses resulting from mortality, low production performance and drug expenses, due to the presence of diseases such as coccidiosis, also known as eimeriosis, which is one of the most prevalent when talking about the health of calves. This disease affects the gastrointestinal tract of these animals, mainly causing diarrhea (LIMA, 2004). Matjila & Penzhorn (2002) estimated losses of approximately US\$ 400 million dollars/year in cattle in the USA, without taking into account the subclinical cases of the disease.

Coccidiosis is caused by species of *Eimeria* spp. highly host-specific (BANGOURA & BARDSLEY, 2020). Twelve species that can parasitize cattle have already been described (JOYNER et al., 1966; JOLLEY & BARDSLEY, 2006), however, *Eimeria bovis* and *Eimeria zuernii* are considered the most pathogenic species (BRUHN et al., 2011).

The infection occurs by ingesting sporulated oocysts present in the environment or water and is favored when there is an accumulation of organic matter or high population density (POLIZEL, 2013).

As part of its cycle, *Eimeria* penetrates the host's intestinal cells, multiplies, and thus causes local lesions that will impair digestive processes and reduce the absorption of nutrients. Several factors influence the pathological and clinical outcome, such as the species of *Eimeria* present, the dose of infection, the potential for replication, inflammatory immune response and concomitant infections with other pathogens, in addition to practices related to management and stress (BANGOURA & BARDSLEY, 2020).

Affected animals may be symptomatic as well as asymptomatic. Clinical signs, when present, include hyporexia, decrease feed conversion and consequently a reduction in their productive potential (POLIZEL, 2013). Also according to Polizel (2013), the clinical form presents mainly with dark diarrhea and this one, which may have blood streaks. In more severe cases, animals may die (FELIPPELLI et al., 2014).

The diagnosis of the disease is based on clinical and epidemiological signs, in addition to a coproparasitological examination, in order to find fecal protozoan oocysts (HILLESHEIM & FREITAS, 2016).

Given the importance of coccidiosis, this study aimed to carry out an epidemiological, retrospective survey of the prevalence of oocysts of *Eimeria* spp. on small dairy farms located in the southern region of Rio Grande do Sul (RS), Brazil.

2 MATERIAL AND METHODS

The results were obtained from a database of diagnoses carried out in the laboratory of the Parasitic Diseases Study Group (GEEP), of the Veterinary School - Federal University of Pelotas (UFPel).

Results from 505 stool samples, became from small dairy farms, located in cities in the southern region of the state of Rio Grande do Sul (RS), Brazil. All farms present similar management systems where the animals are created in a semi-intensive system. The calves were Jersey and Holstein breeds or them crossbreeds, and the animal samples were collected from weaning to the first insemination, ranging from 1 to 15 months of age.

The closed samples were processed using the Gordon and Whitlock (1939) technique and the result expressed in oocysts per gram of feces (OoPG).

3 RESULTS AND DISCUSSION

All the analyzed properties showed enteroparasitic positivity for species of the genus *Eimeria*. Of the total samples analyzed, 54.65% (276/505) were positive for oocysts of this genus, with an average count of 545 OoPG.

In cattle, a study from the United States (Georgia) indicated an 86% prevalence of *Eimeria* spp. oocysts in young calves, with a high percentage of highly pathogenic oocysts (ERNST et al., 1987). Ferreira et al. (2009), in Minas Gerais, found a prevalence of 48.23% for Eimeriosis in calves, similar data as presented in this study. In the Cesar department in Colombia, Pinilla et al. (2018) found 77.9% prevalence of *Eimeria* spp.

According to Lima (2004), coccidiosis is essentially a disease of young animals and its morbidity, mortality and economic impact are mainly associated with this animal category, as they still have reduced immunity to infections (BONFIM & LOPES, 1994; SILVA, 2006). In general, coccidiosis becomes a problem for dairy calves at weaning when they are in grouped. This stress combined with an environment that encourages fecal contamination of food, water sources and fur, creates an ideal situation for eimeriosis. According to Rebhun (2000), the clinical signs of parasitosis are highly observed in calves from eight to 16 weeks of age.

The breeding system is also a factor that directly interferes with the resources of eimeriosis. In high population density, intensive rearing, poor hygiene in drinking fountains, troughs and facilities, the disease occurs more frequently and severely (LIMA, 2004; SÁNCHEZ et al., 2008), as well as in periods with heavy rainfall, humid places and poor hygiene (DAUGSCHIES E NAJDROWSKI, 2005).

In the present study, as properties maintained in a semi-intensive system of creation and infection by young animals, it can be explained by the fact that adult animals are useful as sources of infection for young animals. In addition, although *Eimeria* infection is self-limiting, as it ends when the parasite completes its evolutionary cycle, due to the high environmental contamination, animals are being exposed constantly to sporulated oocysts, which are the infectious forms (LIMA, 2004).

Cechin & Diaz (2013) conclude that subclinical coccidiosis is the most common form of this infection and, even though insensitive to the perception of the producer, the losses resulting from this form of endoparasitosis are large and may have greater economic significance than losses due to death or by clinical manifestation. Such losses come, among others, from losses in the physiology of the affected animals, lower weight gains and greater susceptibility to secondary infections and other diseases.

4 CONCLUSIONS

In conclusion, this protozoan has a high prevalence in dairy farms in cities located in Pelotas region of Rio Grande do Sul (RS).

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