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PREVALENCE OF PARASITOSIS IN DAIRY CALVES

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ABSTRACT

This study aimed to identify gastrointestinal parasites present in calves with diarrhea by means of coproparasitological analysis. Fecal samples were examined under an optical microscope, using 40x and 100x magnifications, allowing the morphological identification of parasitic eggs and oocysts. Structures compatible with Moniezia spp., Trichostrongylus spp., Haemonchus spp. and Eimeria bovis were observed, the latter being the most frequent among the animals analyzed. The presence of these parasites highlights the importance of early diagnosis and continuous monitoring, since parasitosis is intrinsically related to gastrointestinal disorders such as diarrhea, directly affecting the zootechnical performance of calves. The results reinforce the need for antiparasitic control strategies adapted to the reality of each farm.

Keywords: Bovines. Gastrointestinal parasites. Parasitology.

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INTRODUCTION

Monitoring faeces during the first few weeks of life is essential to the evaluation of the health, digestion, and nutrition of calves. The appearance and consistency of the faeces show changes in consistency as the animal passes from birth to weaning, and later, to post-weaning. In this context, it is very common to come across diarrhea in calves, one of the main causes of delays in the development of this animal category, resulting in an event of great economic importance. Parasitic diseases continue to be one of the main sanitary and productive obstacles in cattle farming, especially in intensive or semi-intensive breeding systems. Among its causative agents, helminths and coccidia stand out.

Bovine eimeriosis is a parasitosis caused by coccid protozoa of the phylum *Apicomplexa*, family *Eimeridae*, genus *Eimeria*. Of the more than a dozen species, *Eimeria bovis* and *Eimeria zuernii* are responsible for serious clinical diseases characterized by hemorrhagic diarrhea with sometimes fatal outcomes.

Tenacious oocysts are ubiquitously found in the environment, making infection of calves and young cattle, the most susceptible age group, almost inevitable. The schizonts of *E. bovis* are large and visible to the naked eye, while those of *E. zuernii* are smaller and more difficult to find.

The clinical signs of coccidiosis appear when gametogonia begins, which is the phase of sexual reproduction, due to the destruction of intestinal mucosal cells by parasites, which results in bloody diarrhea, called black course.

In its life cycle, *Eimeria* is ingested as sporulated oocysts, multiplies in the host, and is excreted as non-sporulated oocysts, which sporulate in the environment and can reinfect calves through contaminated water, pasture, or contact with other animals. (JOLLEY and BARDSLEY, 2006).

According to Hillesheim and Freitas (2016), calves raised in an extensive system and collectively have three times the prevalence rate of *Eimeria sp*. when compared to calves raised individually. Oocysts have a great capacity for survival and maintain the ability to infect for weeks or months.

In addition to bloody diarrhea, coccidiosis can cause: dehydration, developmental delay and, in severe cases, mortality. However, the disease can present in the subclinical form with discrete effects, translated by a small reduction in body development, depending on the amount of oocysts ingested. The diagnosis of eimeriosis is based on the patient's history, clinical signs, and parasitological examination (LIMA, 2004). Among the nematodes that affect calves, trichostrongylids are common and pathogenic, especially for ruminants on pasture; the abomasum and small intestine are their main sites of parasitism in

ruminants. The species that affect cattle are: *Trichostrogylus axei* and *Trichostrogylus colubriformis*.

T. axei is a parasite that lodges in the abomasum of ruminants, causing hemorrhagic lesions, loss of proteins to the intestinal lumen and shortening of the mucosal villi, resulting in alteration of gastric pH and increased mucosal permeability. On the other hand, the species *T. colubriformis* mainly affects the anterior part of the small intestine (FAZZIO et al., 2016; SILVA, 2014).

The genus *Haemonchus* is also noteworthy, which is present throughout the national territory, with *H. placei* and *H. similis* being found more frequently in cattle (BOWMAN, 2010). Due to their high frequency and pathogenicity, they developed resistance to anthelmintics. In four herds studied by Lopes et al. (2014), with 48 calves, the administration of ivermectin was not effective against *H. placei*. It is a hematophagous helminth, producing lesions in the mucosa of the abomasum that can cause loss of blood and plasma to the intestinal lumen, consequently it can cause severe anaemia and the animal can present submandibular edema and loss of appetite.

Haemonchus placei has a direct life cycle, with infective larvae (L3) developing in the environment and being ingested during grazing. Inside the host, they mature in the abomasum, where adults reproduce and shed eggs in the feces, continuing the cycle. (SILVA, 2014).

In *Cestoda* class, *Moniezia benedeni* stands out, a parasite of the small intestine, which causes a wide variety of clinical signs such as progressive weight loss, diarrhea, respiratory symptoms and seizures, but is usually asymptomatic, with two important species: *M. expansa* and *M. benedeni*, with severe conditions in young animals. Ruminants are the definitive hosts of *Moniezia*, whose eggs are released in the feces and ingested by oribatid mites, where they develop into infective cysticercoid larvae. (SANTILIANO, 2016; FRANCO et al., 2012).

These parasites share important characteristics, such as high prevalence in young animals, dependence on favorable environmental conditions for perpetuation, and direct impact on productivity and animal welfare. The identification of the causative agent, combined with hygienic-sanitary management measures and strategic antiparasitic control, consequently generates a prosperous environment for cattle farming.

The objective of this study was to identify the main helminths found in the feces of 18 calves that presented diarrhea in three dairy units located in the southern region of the State of Paraná.

MATERIAL AND METHODS

The study was carried out in three dairy farms located at São José dos Pinhais and Palmeira, in Parana State. Feces were collected from 18 calves aged 5 to 40 days that presented diarrhea. Fecal samples were obtained through rectal collection using disposable gloves and were identified according to the earring number of the respective calves.

After collection, the material was stored in a cooler and was transported to the Parasitology Laboratory of the UniCuritiba University, where the parasitological examination of feces was performed by the Willis Method (flotation), which consists of diluting a part of the fecal sample in a saturated solution of sodium chloride in a Becker cup with the help of a glass stick. Then, this solution was filtered through a gauze folded four times into a test tube to the edge, and with a dropper there was filling until the formation of a positive meniscus. Than, the coverslip was placed on the surface, remaining in contact with the liquid for ten minutes, and then the coverslip was transported to a slide, added with a drop of lugol and then observed under an optical microscope.

RESULTS AND DISCUSSION

In four samples, *Trichostrongylus* eggs were observed, with oval morphology, thin wall and absence of polarity structures. Five samples showed oval and symmetrical structures, with smooth walls and embryonated, with blastomeres, corresponding to nematodes of the genus *Haemonchus*. Oocysts of *Eimeria bovis* were also observed in twelve samples, with ovoid-shaped structures, smooth wall with double layer and granular mass inside. *Moniezzia* was found at two samples.

All the calves analyzed had parasites in their feces, with a higher prevalence (12/18) for *Eimeria sp*. In three calves more than one agent was found. These forms of parasitism result in diarrhea, anorexia, dehydration, weight loss, erythropenia, increased leukocyte count followed by leukopenia, and, in calves with hemonccosis, submandibular edema. The results are presented at Table 1.

Table 1: Stool parasitological findings in 18 calves of milk farms at South Paraná

Number of samples	Magnification (optical microscope)	Observed morphology	Diagnosis
4	40x	Variable-shaped eggs, roughly quadrangular	*Moniezia spp.*
4	40x	Oval, thin-walled eggs, no polarity structures	*Trichostrongylus spp.*
5	100x	Oval, symmetrical structure, thin and smooth membrane, embryos with blastomeres	*Haemonchus spp.*

12	40x and 100x	Ovoid structure, double smooth wall, granular mass	Eimeria bovis

Table 2 shows the distribution of parasitism by age. *Eimeria* and *Haemonchus* co-infection was observed in calves at 27, 32, 34 and 36 days old. A calf with 34 days had *Trichostrongylus, Haemonchus* and *Eimeria* simultaneously.

Table 2. Distribution of parasites identified by calf age (+ parasite present; – parasite absent)

Age (days)	*Moniezia spp.*	*Trichostrongylus spp.*	*Haemonchus spp.*	*Eimeria bovis*
5	+	-	-	-
19	+	+	-	-
21	-	+	-	-
25	-	-	-	+
26	-	-	-	+
27	-	-	+	+ (2 calves)
28	-	-	-	+
29	-	+	-	-
32	-	-	+	+ (3 calves)
34	-	+	+	+
35	+	-	-	+
36	+	-	+	+
38	-	-	+	-
40	-	-	-	+

Coinfection with *Eimeria spp*., *Haemonchus spp*., and *Trichostrongylus spp*. can exert synergistic effects on the host, intensifying damage to the intestinal epithelium, blood loss, and reduced nutrient absorption, thereby compromising growth and favoring severe clinical outcomes such as anaemia, dehydration, and severe diarrhea (TAYLOR et al., 2016). Moreover, multiple infections complicate clinical and laboratory diagnosis, require broader therapeutic approaches, and increase the risk of anthelmintic resistance in the absence of strategic parasite control (KAPLAN and VIDYASHANKAR, 2012). From a productive standpoint, these infections are associated with reduced weight gain, increased mortality, and developmental delays, negatively affecting the animals' future productivity (CHARLIER et al., 2009). The high frequency of coinfections in age groups between 32 and 36 days of life, as observed in this study, underscores the importance of preventive strategies based on strict sanitary management, early parasitological monitoring, and rational use of antiparasitic drugs.

In this context, the administration of anticoccidial agents such as toltrazuril or diclazuril is recommended for the treatment of animals infected with *Eimeria* spp (PHILIPPE et al., 2014). Additionally, broad-spectrum anthelmintics such as albendazole or doramectin should be employed for the control of gastrointestinal nematodes, including *Haemonchus* spp. and *Trichostrongylus* spp., as well as cestodes such as *Moniezia* spp. In cases of

mixed infections involving *Eimeria* and nematodes, a combined therapeutic approach utilizing both anticoccidial and anthelmintic agents is advised (SOUZA et al., 2008).

In addition to therapeutic intervention, appropriate management of the calves is also essential; both as a preventive measure and to avoid reinfection. One effective strategy is the individual calf houses during their first 60 days of life, such as the calf breeding sites of Argentina. In this system, calves are individually contained in limited spaces directly in the pastures. This method is an effective and low-cost strategy to reduce the risk of contamination and disease transmission between calves.

CONCLUSION

It was possible to observe how the relationship between diarrhea in calves and parasitosis is intrinsic, this is due to the fact that they cause lesions in the intestinal mucous membranes, microbiota imbalance, inflammation and malabsorption of nutrients. The presence of helminths and coccidia was observed in the samples. The climate in which the animals were, their production and management system are predisposing factors for the prevalence of these parasites in the feces at this age.

The identification of these agents is important for the accuracy of the diagnosis, allowing the most appropriate choice of therapeutic and control measures. In addition, this practice helps in the evaluation of parasite load, in the monitoring of resistance to antiparasitics and in the prevention of zootechnical damage related to the developmental delay of these young animals.

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