

Short communication

Prevalence of Coccidiosis in Calves in the Green Mountain Region and the Impact of Balanced Nutrition and Treatment on the Health of Fattening Calves

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Coccidian, Eggs, Eimeria, Calves, Fiber, Al-Bayda.

ABSTRACT

This study was conducted following a complaint from a breeder that his calves, intended for fattening, were suffering from symptoms such as bloody diarrhea, dehydration, and loss of appetite. Five young calves, aged between two and three months, were brought to the Al-Salfium Veterinary Services Center in Al-Bayda during January. Their temperatures were found to be low, and they exhibited bloody diarrhea in the perineal area, a characteristic symptom. Veterinarians took rectal samples and transported them to the Omar Al-Mukhtar University Veterinary Teaching Hospital in Al-Bayda. The samples were immediately subjected to parasitological examination, which revealed the presence of coccidia eggs in almost all of them. After spore formation, a range of Eimeria species were identified. Further examination revealed that Eimeria zuernii was the most prevalent species in the tested samples, followed by Eimeria spp. spherica, and then species of Apaminis and Bovis. These calves were given a balanced diet containing fiber and protein, along with some therapeutic medications to support their health, such as sulfadimethoxine and butrim, for approximately 5 to 7 days. The calves began to feel better starting from the fourth day.

Introduction

Coccidia are single-celled intestinal parasites belonging to the protozoa, of which approximately 25 species have been recorded [1]. More than 25 species of coccidia have been identified in calves worldwide, including some of the most dangerous, such as Eimeria bovis, Eimeria brasiliensis, and Eimeria hea, all of which are strongly associated with clinical disease [2]. Transmission of infection is due to the presence of eggs in contaminated feed or water contaminated with the feces of animals infected with eggs, and it often occurs due to calves licking each other [3].

Coccidiosis is an intestinal parasite that causes problems for cattle, especially calves aged 6 to 8 months, and infection may occur in calves aged 10 months [4]. The infection is particularly active in animals raised in barns contaminated with eggs, especially in winter, or if there is moisture on the barn floor [5]. The infection spreads significantly in calves being prepared for fattening [6]. There is a risk in calves that are poorly fed or not fed a balanced diet [7]. Calf infections tend to worsen, especially when they are under stress during weaning, have a sudden change in feed, or are exposed to harsh weather conditions, particularly in winter [8]. Subclinical infection is most common in young calves, with clear symptoms including diarrhea, reduced growth rate, and diarrhea that is often bloody [9].

Epidemiological information on the presence of coccidiosis, particularly the presence of Eimeria parasites, which are among the most dangerous and widespread types, is a necessary and fundamental step in building an effective program capable of combating coccidiosis and improving animal health. The aim of this study was to limit the spread of this parasite, determine its prevalence in the Green Mountain region, and identify all species in the surrounding areas.

Methods

Rectal samples were collected immediately after putting on medical gloves, following established procedures. The samples were then transported in clean plastic containers, free of any physical or chemical contaminants, to the central laboratory at the Veterinary Teaching Hospital. There, they were examined and diagnosed one hour later using qualitative testing (flotation technique) to detect eggs.

The quantitative method was performed to determine the number of eggs in the sample per gram of stool. This method is known as the McMaster technique [10]. Then water was used to dilute the sample by washing it several times using a centrifuge at a speed of 3000 rpm for 10 minutes to concentrate the sample. Petri dishes were used that were covered with a layer of potassium dichromate from Sigma-Aldrich to ensure the dispersal of the eggs. The sample was kept at a temperature of 25 degrees Celsius for 12 days until the bags sprouted. The sample was mixed well, then a portion of the sample was placed on a slide and covered with a coverslip. After that, the sample was examined with a microscope at 400x magnification in order to determine the morphological characteristics [11].

Using Microsoft Excel 2010, all data were entered, and the minimum and maximum values, as well as the arithmetic means, were analyzed. Percentages were used to calculate the spread.

Results and Discussion

Using the McMaster technique to examine stool samples, the values per gram of stool reached 6600, 13000, and 720000 (Table 1). Several studies have indicated that there are large numbers of eggs in normal stool, unlike bloody diarrhea, which contains very few [12]. In this study, very high values were recorded, and this is due to the calves' weak immunity and very poor nutrition. When a history was taken, it indicated that the calves had been suffering from coccidiosis for some time. There are similar cases, as reported by [13] in this study, of calves aged 6 to 7 months infected with the coccidiosis parasite. This result is consistent with previous studies[14]. This may be due to the lack of immunity and the weakness of the nutritional and drug program followed [15].

The examination revealed the presence of approximately 12 types of Eimeria, but two types of Eimeria were more pathogenic, namely Zwerny and Bovis. Zwerny had a percentage of 10.39, which is the most widespread among the other types, then Peleta had a percentage of 15.60, then, among the most widespread types was Eimeria apamensis at a percentage of 6.13, then Bovis at a percentage of 1.90, then Eimeria sapspherica at a percentage of 2.12. All these results obtained are consistent with those obtained by[16].

The spread of Eimeria species is attributed to the harsh climatic conditions in the Green Mountain region, the type of feed provided, and the health status of the calves. Here, the severity of coccidiosis depends on the total number of ingested and oocysts, feed, and health status [17]. Treating coccidiosis is difficult because the symptoms or signs of the disease do not appear until the life cycle is complete [18]. It is known that all drugs against this parasite are only effective in the early stages after infection [19].

In this study, solutions to strengthen immunity, dextrose solution to prevent dehydration due to diarrhea, Ringer's lactate solution, and some balanced feeds containing vitamins, minerals, and fiber were administered. Metronidazole was also given at a dose of 10 mg/kg.

Table 1: The prevalence of Eimeria oocysts in calves in Jabal al-Akhdar.

Sample	Type of Eimeria and prevalence rate	Types of Eimeria parasites	Parasite prevalence rate
Six and a half-month-old male fattening calves	13000	E.Zuernii	10.39
		E.Pellita Like	15.60
		E.Alabamensis	6.13
		E.Subspherica	2.12
		E.Bovis	7.6
Calves aged 5 months	6600	E.Zuernii	18.6
		E.Subspherica	5.2
Female calves, 5 months old	720000	E.Zuernii	18.2
		E.Subspherica	5.99

Table 2: The sporulation time of Eimeria eggs and micrometric measurements of Eimeria species.

Types of Eimeria	Average size of an Eimeria (length x width)	Maximum size of the Eimeria (length x width)	Minimum Eimeria dimensions (length x width)	Eimeria bloom time
E.Zuernii	16.50 x 15.53	17.12 x 17.80	15.14 x 14.12	2-4
E.Pellita Like	15.60 x 14.30	16.90 x 15.23	14.22 x 16.13	2-3
E.Alabamensis	17.47 x 15.60	17.55 x 16.67	15.23 x 16.77	2-4
E.Subspherica	14.90 x 14.12	15.13 x 15.11	14.95 x 15.9	2-5
E.Bovis	27.13 x 19.20	28.14 x 19.57	27.22 x 28.10	2-4

Conclusion

This study revealed that while there are many pathogenic species, Eimeria zeyrinii is the primary cause of coccidiosis. Therefore, preventative measures must be taken to protect calves, especially those with weakened immune systems. These measures include balanced nutrition, proper milk feeding, continuous pen cleaning, intravenous fluid administration, and administering preventative medications for thirty days to ensure protection and maintain the overall health of the calves.

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