

A Study of Coccidiosis in Livestock in the Island of Dominica

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Abstract

The following experiment was done to investigate and study the incident of coccidiosis in the island of Dominica. Within this study I was able to see the various physical characteristics of this parasite and its impact on both local livestock and farmers. The experiment was done by visiting various sites along the island and collecting fecal samples from goats, cattle and poultry. All samples were collected by Dr. Lennox St. Aimee. Dr. St. Aimee also was able to stress that the host specimens we were collecting samples from did appear to be suspect for some form of bacterial parasite illness.

Samples were then processed via a Vet One© Fecal Diagnostic Kit and later viewed under a microscope for the presence of *Eimeria*. Confirmation for the presence of this parasite was done by Dr. St. Aimee; so as to prevent misdiagnosis of the animal. Of the 19 fecal samples used, only three were found to have been infected. Pictures of the parasite were taken using a Nikon Eclipse E8,000 microscope and were included in the report.

Introduction

Coccidiosis is an invasion and destruction of intestinal mucosa by various protozoa of the genera *Eimeria* or *Isospora*. Symptoms of infection are usually characterized by diarrhea, fever, lack of appetite, weight loss and death. Due to its associated mortality and morbidity, this disease has posed as a big economical threat to livestock producers (1). Coccidiosis is a serious threat to all species of livestock. *Eimeria* in particular is most prevalent amongst goat species in all growth and developmental stages (2).

Infection results from ingestion of oocysts derived from the parasite, usually found in feces of an infected host. When the oocyst is ingested by a susceptible animal, the sporozoites

escape from the oocyst, invade the intestinal mucosa and further develop in the intestinal tract. The nucleuses found within the parasite each develop into an infective body called a merozoite. These new infective bodies enter new cells and repeat this process (2).

Coccidiosis is seen most commonly in animals that are confined in small areas contaminated with oocysts. The Island of Dominica has shown to be mainly composed of small scale agricultural operations. This type of operation is comprised of the utilization of more grass and forage based diets while confining livestock in tight quarters. The components to a small scale livestock operation is key to this parasite's life cycle and virulence. Infection found during a later age is found to be from sources of contaminated straw found on the floor; originating from excreting mothers and older individuals (2).

Materials and Methods

For this study, it initially required 19 selected hosts, at different locations, fecal flotation kits, fecal flotation solution, latex gloves, microscope slides, 22 mm microscope cover slips a Nikon Eclipse E8,000 microscope to take pictures of the parasites and a Letca Compound microscope to analyze the samples. These locations were: Delices, Marigot, Central Livestock Facility, Douglas Bay, Grand Bay, La Plaine and Grand Coulibri. Samples were gathered and recorded on May 30th and June 1st by Dr. Lennox St. Aimee. Dr. St. Aimee aided in the gathering and processing of these samples that ranged from 16 goat samples, two cattle samples and one sample that was from a chicken broiler. These samples were gathered by hand by Dr. St. Aimee upon arrival to the site. After informing the owner of the purpose of our experiment, risks associated with the parasite and community prevalence of *Eimeria*, local farmers/owners allowed us to continue.

Nineteen Vet One© Fecal Diagnostic Kits were used as flotation devices. This required us to pop the cap to the device, insert small amount of the fecal sample and fill the kit with fecal flotation solution to the bottom point of the arrow on the side of the vial. I then thoroughly agitated the solution and fecal sample by turning the green insert back and forth. This releases the ova from the waste material. I then securely pressed the green insert down in the kit and continued to fill the kit to the top, so as to form a meniscus. After placing a 22 mm square microscope cover slip on top of the meniscus, I waited for 15-20 minutes to allow full ova flotation.

After the 15-20 minute waiting period, I then placed the 22 mm microscope cover slip onto a microscope slide and started to analyze for the presence of *Eimeria*. Images from experiment sources were used in determining if the specimen was positive for infection. All used Fecal Diagnostic kits were disposed of in a proper sanitary container.

Results

Table 1: The following table displays the origin of all fecal samples collected for this experiment.

DATE	SPECIES #	SPECIES	SEX	LOCATION	FARMER #	EIMERIA FOUND
5/30/2012	1	GOAT	F	LA PLAINE	1	Positive
5/30/2012	2	GOAT	M	LA PLAINE	1	Positive
5/30/2012	3	GOAT	F	LA PLAINE	1	Positive
5/30/2012	4	GOAT	F	DELICES	2	Negative
5/30/2012	5	GOAT	F	DELICES	2	Negative
5/30/2012	6	GOAT	F	DELICES	2	Negative
5/30/2012	7	GOAT	F	MARIGOT	3	Negative
5/30/2012	8	GOAT	F	MARIGOT	3	Negative
5/30/2012	9	GOAT	F	MARIGOT	3	Negative
5/30/2012	10	CATTLE	F	CLF	4	Negative

5/30/2012	11	CHICKEN	F	GRAND BAY	5	Negative
5/30/2012	12	CATTLE	F	DOUGLAS BAY	6	Negative
5/30/2012	13	GOAT	F	DOUGLAS BAY	7	Negative
5/30/2012	14	GOAT	F	DOUGLAS BAY	7	Negative
5/30/2012	15	GOAT	M	DOUGLAS BAY	7	Negative
5/30/2012	16	GOAT	F	DOUGLAS BAY	7	Negative
6/1/2012	17	GOAT	F	GRAND BAY	8	Negative
6/1/2012	18	GOAT	F	GRAND COULIBRI	8	Negative
6/1/2012	19	CATTLE	F	GRAND COULIBRI	9	Negative

Figure 1: The following figure on the left displays a photo image of an *Eimeria* parasite collected from one of the three infected hosts. The image on the right was found and used as a key in comparing the two in similarities.



<http://cal.vet.upenn.edu/projects/dxendopar/artifacts.html>

Discussion

In conclusion, the resulting data displayed that *Eimeria* was prevalent from the same species of livestock and producer. These species were three goats from La Plaine. Dr. St. Aimee was also able to state that this particular area is historically always infected with this disease. This particular farmer also had his goats confined in tight quarters, justifying our claim that *Eimeria* is more prevalent in livestock in these type of conditions. Difficulties arising from this experiment

were the amount of other parasites found in the fecal samples. These parasites displayed many similarities in physical attributes that made it initially harder to distinguish and derive to a conclusive decision as to the presence of *Eimeria*.

Due to the derived conclusion of the presence of *Eimeria* in this farmer's goats, the farmer should now consider quarantining the infected goats, and immediately commence premise and host treatment so as to minimize further infection.

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Works Cited

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