# RISK FACTORS ASSOCIATED WITH DETECTION OF *CRYPTOSPORIDIUM SPP.* IN SOIL SAMPLES

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This study evaluted risk factors associated with the presence of Cryptosporidium spp. found in soil samples. The samples were taken from dairy farms located in the New York City Watershed. Areas of runoff from various contamination sources were targeted for sampling and samples up to 2 inches in depth were collected. Samples were processed using an adaptation of the flotation technique to detect the precense of Cryptosporiium oocysts. In addition, the pH and % moisture content of these samples were determined. At the time of collection, a questionairre was administered in the form of an interview to collect information on the farm, herd, and management practices of the farm. Unconditional logistic regression was then used to identify risk factors associated with the presence of Cryptosporidium oocysts. Identification of risk factors will enable suggestions to be made in how control contamination through proper management of this land.

## INTRODUCTION

Cryptosporidiosis is a gastrointestinal disorder caused by the parasite, *Cryptosporidium parvum*. This disease can be characterized by severe gastroenteritis, nausea, fever, and diarrhea. *Cryptosporidium parvum* and *Cryptosporidium muris* are the species most commonly associated with infection in humans and other mammals. This organism can be transmitted through water and has been implicated in several waterborne disease outbreaks throughout the world.

*Cryptosporidium* is a coccidian which can infect the small intestine of most mammals, including humans. The organism invades the host who then sheds an infective oocyst into the environment through the feces. *Cryptosporidium spp.* has been found to be prevalent in bovine populations, and these populations may serve as a source of contamination into water supplies through excretion and through the process of manure spreading on farmland. Runoff from the land contaminated by these sources serves as a vehicle through which the *Cryptosporidium* oocysts can travel into water sources. By contaminating the environment, it is recognized that dairy farms serve as a potential source of exposure of the human population to *Cryptosporidium spp.* As a zoonotic pathogen, the route of transmission of the *Cryptosporidium* oocyst from the calf to the water source through the environment must be determined in order to implement control and ultimately prevention of contamination of public water supplies.

There are no efficient methods to detect this organism in the environment. In order to assess the prevalence of *Cryptosporidium spp.* in soil samples and identify risk factors associated with its presence, we developed methods for environmental sampling of this organism and designed a cross-sectional epidemiologic study of dairy farms located in the New York City Watershed.

## METHODS

Through the use of an questionnaire administered by interviewed, we collected information regarding the herd, the site of collection and management practices of the farm. At the time of the farm visit, soil samples were collected. Soil samples were collected by targeting areas of runoff from potential sources of contamination. Samples were collected up to a depth of 2 inches by using a steel ring with a 3 inch diameter pushed into the ground. Samples were stored in sealed bags and returned to Cornell University for laboratory processing. Samples were evaluated for pH, % moisture content and parasite identification. Samples were tested for the presence of *Cryptosporidium spp.* using an adaptation of the flotation procedure.

Unconditional logistic regression was then used to identify risk factors associated with the presence of *Cryptosporidium spp.* Identification of risk factors will enable suggestions to be made in how control contamination through proper management of this land.

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