

**Poster title:** Prevalence Studies in the Western United States for Epidemiological Investigation of Cyclosporiasis Outbreaks

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## **Introduction**

Protozoan intestinal parasites contribute heavily to the 1.7 billion reported cases of diarrheal disease each year worldwide, severely burdening health services. Among these parasites, *Cyclospora cayetanensis* has emerged as a microbial pathogen of public health concern. *C. cayetanensis* is a human-specific coccidian parasite which causes a diarrheal disease called cyclosporiasis, which in some cases can become severe and chronic. This parasite has caused large outbreaks of disease in developed countries in which consumption of fresh produce contaminated with *Cyclospora* oocysts has been implicated as the transmission route.

## **Purpose**

However, the mode by which contamination occurs is currently unknown. To discover how fresh produce becomes contaminated with sporulated oocysts, prevalence studies were performed using samples originating from produce-growing regions of California.

## **Methods**

Methods followed the FDA Bacteriological Analytical Manual Chapter 19C protocols for analysis of agricultural water for *Cyclospora cayetanensis*, which included dead-end ultrafiltration, extraction and purification of DNA, and real-time qPCR assays. Flow cytometry and imaging were used to analyze a selection of the samples. Further study will include Oxford nanopore downstream amplicon target genome sequencing using eight DNA markers from the CDC and one which encodes for cytochrome oxidase from the FDA in order to confirm positive samples and enable future source tracing. In addition, when genome sequencing is complete, samples will be analyzed using gel electrophoresis.

## **Results**

At this point, a total of 151 samples have been taken from agricultural regions of California between 2021-2022, including ultrafiltration filters, grey water, sponge-sticks, and sludge.

## **Significance**

To determine how produce initially becomes contaminated by *Cyclospora* oocysts represents the first step towards the prevention of future outbreaks of cyclosporiasis, and the methods used to perform this study have the potential for broader future applications to the fields of parasitology and epidemiology.