

**Bad
Bug
Book**

U.S. Food & Drug Administration
Center for Food Safety & Applied Nutrition
Foodborne Pathogenic Microorganisms
and Natural Toxins Handbook

Cryptosporidium parvum

Education

CDC/MMWR

NIH/PubMed

1. Name of the organism:

Cryptosporidium parvum

Cryptosporidium parvum, a single-celled animal, i.e., a protozoa, is an obligate intracellular parasite. It has been given additional species names when isolated from different hosts. It is currently thought that the form infecting humans is the same species that causes disease in young calves. The forms that infect avian hosts and those that infect mice are not thought capable of infecting humans. *Cryptosporidium* sp. infects many herd animals (cows, goats, sheep among domesticated animals, and deer and elk among wild animals). The infective stage of the organism, the oocyst is 3 um in diameter or about half the size of a red blood cell. The sporocysts are resistant to most chemical disinfectants, but are susceptible to drying and the ultraviolet portion of sunlight. Some strains appear to be adapted to certain hosts but cross-strain infectivity occurs and may or may not be associated with illness. The species or strain infecting the respiratory system is not currently distinguished from the form infecting the intestines.

2. Disease Name:

Intestinal, tracheal, or pulmonary [cryptosporidiosis](#).

3. Nature of Acute Disease:

Intestinal cryptosporidiosis is characterized by severe watery diarrhea but may, alternatively, be asymptomatic. Pulmonary and tracheal cryptosporidiosis in humans is associated with coughing and frequently a low-grade fever; these symptoms are often

accompanied by severe intestinal distress.

Infectious dose--Less than 10 organisms and, presumably, one organism can initiate an infection. The mechanism of disease is not known; however, the intracellular stages of the parasite can cause severe tissue alteration.

4. Diagnosis of Human Illness:

Oocysts are shed in the infected individual's feces. Sugar flotation is used to concentrate the organisms and acid fast staining is used to identify them. A commercial kit is available that uses fluorescent antibody to stain the organisms isolated from feces. Diagnosis has also been made by staining the trophozoites in intestinal and biopsy specimens. Pulmonary and tracheal cryptosporidiosis are diagnosed by biopsy and staining.

5. Food Occurrence:

Cryptosporidium sp. could occur, theoretically, on any food touched by a contaminated food handler. Incidence is higher in child day care centers that serve food. Fertilizing salad vegetables with manure is another possible source of human infection. Large outbreaks are associated with contaminated water supplies.

6. Relative Frequency of the Disease:

Direct human surveys indicate a prevalence of about 2% of the population in North America. Serological surveys indicate that 80% of the population has had cryptosporidiosis. The extent of illness associated with reactive sera is not known.

7. Usual Course of the Disease and Complications:

Intestinal cryptosporidiosis is self-limiting in most healthy individuals, with watery diarrhea lasting 2-4 days. In some outbreaks at day care centers, diarrhea has lasted 1 to 4 weeks. To date,

8. Target Populations:

there is no known effective drug for the treatment of cryptosporidiosis. Immunodeficient individuals, especially [AIDS](#) patients, may have the disease for life, with the severe watery diarrhea contributing to death. Invasion of the pulmonary system may also be fatal.

In animals, the young show the most severe symptoms. For the most part, pulmonary infections are confined to those who are immunodeficient. However, an infant with a presumably normal immune system had tracheal cryptosporidiosis (although a concurrent [viremia](#) may have accounted for lowered resistance). Child day care centers, with a large susceptible population, frequently report outbreaks.

9. Analysis of Foods:

The 7th edition of FDA's [Bacteriological Analytical Manual](#) will contain a method for the examination of vegetables for *Cryptosporidium* sp.

10. Selected Outbreaks:

Since 1984, cryptosporidiosis has been associated with outbreaks of diarrheal illness in child day care centers throughout the United States and Canada. During 1987 a waterborne outbreak in Georgia produced illness in an estimated 13,000 individuals, and exposure to contaminated drinking water was the major distinction between those that were ill and those that were not. This was the first report of disease transmission by a municipal water system that was in compliance with all state and federal standards for

An outbreak of cryptosporidiosis associated with the consumption of apple cider is reported in [MMWR 46\(1\):1997 Jan 10](#).

[MMWR 45\(36\):1996 Sep 13](#) reports on

11. FDA Regulations or Activity:

12. Education:

13. Other Resources:

an outbreak of cryptosporidiosis associated with the consumption of home-made chicken salad in Minnesota.

A non-food outbreak of cryptosporidiosis in a day-camp is reported in [MMWR 45\(21\):1995 May 31](#). This report is linked to this chapter to provide reference information.

[MMWR 39\(20\):1990 May 25](#) reports on a non-food related outbreak of cryptosporidiosis, but contains useful information on *Cryptosporidium* sp.

For more information on recent outbreaks see the [Morbidity and Mortality Weekly Reports](#) from CDC.

FDA is developing and improving methods for the recovery of cysts of parasitic protozoa from fresh vegetables. Current recovery methods are published in the [Bacteriological Analytical Manual](#).

The CDC has [information](#) on *Cryptosporidium*.

From GenBank there is a [Loci index for genome *Cryptosporidium parvum*](#).

CDC/MMWR

The CDC/MMWR link will provide a list of Morbidity and Mortality Weekly Reports at CDC relating to this organism or toxin. The date shown is the date the item was posted on the Web, not the date of the MMWR. The summary statement shown are the initial words of the overall document. The specific article of interest may be just one article or item within the overall report.

NIH/PubMed

The NIH/PubMed button at the top of the page will provide a list of research abstracts contained in the National Library of Medicine's MEDLINE database for this organism or toxin.

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