
ENVIRONMENTAL Fact Sheet



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Giardia and Cryptosporidium in Drinking Water

What are Giardiasis and Cryptosporidiosis? *Giardia lamblia* (*Giardia*) and *Cryptosporidium* (crip-toe-spor-id-ee-um) are intestinal parasites which can cause a diarrheal illness in humans and animals called Giardiasis and Cryptosporidiosis, respectively. They are commonly found in many areas of the world, including New Hampshire. The parasites occur naturally in warm blooded animals such as beaver, muskrat, and other wildlife. The organism is hearty and can survive in cold waters for weeks. Consequently, *Giardia* and *Cryptosporidium* can be expected to be naturally present in any surface water supply. Both also occur in humans, therefore, proper wastewater disposal is critical to minimize disease transmission. These parasites are too small to be seen with the naked eye.

What are the Symptoms of Giardiasis? Typical symptoms of giardiasis are diarrhea, abdominal cramps and fatigue. Symptoms usually begin approximately two weeks after exposure, however, many infected persons never develop symptoms. The illness caused by *Giardia* may resemble many other illnesses. The appropriate method to confirm a *Giardia* infection is by laboratory analysis of stool samples. Giardiasis is usually not life threatening to an otherwise healthy person. Medication can normally cure giardiasis in approximately 10 days.

What are the Symptoms of Cryptosporidiosis? The symptoms of Cryptosporidiosis are diarrhea, headache, abdominal cramps, nausea, vomiting and low-grade fever. Onset typically occurs within two to 10 days after exposure. There is no treatment for Cryptosporidiosis. In an otherwise healthy person, Cryptosporidiosis symptoms usually last one to two weeks by which time the body's immune system is able to overcome the infection. In persons with compromised immune systems and the very young or old, the infection may continue and become life-threatening. See your doctor to determine whether symptoms are caused by *Cryptosporidium*, and what actions to take.

How are Giardiasis and Cryptosporidiosis Spread? Infection with the diseases can occur via ingestion of contaminated food or water. Both can be contracted by the consumption of unfiltered surface water, groundwater that is directly impacted by surface water, surface runoff, or through other types of pollution. They can also be acquired by ingestion of poorly washed food and by direct contact with the feces of animals or humans infected with the parasite. Giardiasis and Cryptosporidiosis commonly affects many members of the same family. Hand-to-mouth reinfection is often a problem among young children due to poor hygiene.

Water Quality Testing

The New Hampshire State laboratory does **not** analyze water samples for either *Giardia* or *Cryptosporidium*. Laboratory testing of water samples for these contaminants is expensive and time consuming. The collection

procedure consists of filtering approximately 500 gallons of water through a cartridge type particle filter, a process which takes approximately six hours. When collection is completed, the cartridge sample must be refrigerated and delivered to the laboratory within 24 hours.

To find a list of laboratories that perform these analyses, visit the Environmental Protection Agency website.

Well Construction. Rather than conduct costly water testing for *Giardia*, NHDES recommends the following alternative procedures.

1. Inspect your well for proper construction. Carefully inspect the cover and exposed sides of the well for a broken casing or a cover that allows entry of contaminants. Look for any construction weaknesses where animal waste, insects, or unfiltered surface water could enter the well. Repair as necessary. For further information concerning good well construction, consult the NHDES fact sheets concerning well design (DWGB-1-2 through DWGB-1-6) on our webpage.
2. Once the well's defects have been repaired, and the well has been disinfected, take samples for coliform bacteria. These samples should be taken after a period of heavy rain and spaced out over weeks or months. NHDES suggests taking three or more bacteria samples and evaluating all results.

If Bacteria Are Absent. There is no direct relationship between coliform bacteria and *Giardia*, however, if your well is properly constructed and the aquifer provides adequate filtration of water percolating into the soil, then *Giardia* should not be present in groundwater. *Giardia* organisms are approximately 5-7 microns in size while coliform bacteria are 1-2 microns in size. Where no coliform bacteria are detected after multiple samples, one can reasonably conclude that if the well's construction and the aquifer's filtration are adequate to exclude the smaller coliform bacteria, then these conditions should also be able to prevent the entry of the larger *Giardia lamblia* organisms.

If Bacteria Are Present. Where coliform bacteria are detected, the well must be judged at risk to *Giardia* and other potentially harmful organisms. In such cases the well's construction or aquifer's filtration must be examined and deficiencies corrected.

Where the well's construction is judged to be sufficient, but bacteria still continue to be present, other actions should be taken. Options include drilling another well or installing a continuous disinfection system. *Giardia* are resistant to disinfection.

For More Information

Please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 or dwgbinfo@des.nh.gov or visit our website at www.des.nh.gov.

Note: This fact sheet is accurate as of September 2019. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.