



# What to Do if You Think Your Well is Contaminated With Giardia

Giardia is a parasitic protozoan that if present in drinking water can cause gastrointestinal illness.

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Regular water testing is important to be sure that your water is safe to drink. Photo: Danielle Rhea, Penn State

While coliform bacteria are frequently identified as a potential pollutant of concern for private water supply owners, *Giardia*, another microorganism that could possibly contaminate water supplies, is less often discussed. *Giardia* are single-celled organisms that are released into the environment through the feces of infected animals, such as people, wildlife, pets, or livestock. These parasites can live for months in the environment but require a host animal in order to reproduce. When ingested, they live in the intestine and can cause Giardiasis, an infection characterized by diarrhea, abdominal cramps, and gas. If you are exhibiting symptoms of Giardiasis, you can consult a physician for a parasitological evaluation and treatment options. *Giardia* is considered to be highly infective; however, the good news is that it is not frequently found in private water supplies in Pennsylvania, especially when compared to coliform bacteria.

Regular water testing is recommended as a best management practice for private water supply owners to ensure that their water is safe to drink. Identifying potential *Giardia* contamination follows a slightly different approach. Testing specifically for *Giardia* is very limited in Pennsylvania and surrounding States, and only a handful of labs across United States are accredited by the Pennsylvania Department of Environmental Protection for testing for *Giardia*. Additionally, the test requires multiple gallons of water and is often expensive, costing hundreds of dollars for just a single test. *Giardia* typically does not exist in groundwater supplies but can be introduced if surface water containing *Giardia* cysts is able to contaminate a well. One way to determine if there is a potential route of surface water contamination to your water supply is by testing for coliform bacteria. While coliform bacteria and *Giardia* are not the same, coliform bacteria are considered

indicator organisms and the presence of these bacteria in a water supply indicates that there is likely a pathway for other organisms, such as *Giardia*, to enter the water supply as well. Testing for coliform bacteria should be done annually and during different seasons because the presence of bacteria can change depending on factors such as the temperature or amount of rain.

The first step for preventing microbial contamination of a water supply is proper well construction. Well casing should extend down to bedrock as well as above the surface of the ground and should be properly grouted to prevent surface water from entering the well prior to being filtered by the soil. Runoff should be directed away from the well and care should be taken around the wellhead to prevent damage. It is also a good idea to have your water supply inspected by a professional every 10 years to look for signs of deterioration that could result in potential contamination.

There are also water treatment options available that are effective against *Giardia*. A simple and effective way to kill *Giardia* is heating water to a full rolling boil for at least one minute. While boiling water would be a time-consuming solution if used long-term, it is a viable option to inactivate microorganisms. More commonly, treating water for *Giardia* involves filtration and disinfection. *Giardia* cysts are large compared to bacteria and can be removed by either whole house or point of use sediment filters with an absolute pore size of 1 micron or smaller. Chlorination is a commonly used continuous disinfection method; however, *Giardia* is known to be more resistant to chlorination than bacteria. Instead, ozonation and ultraviolet (UV) treatment systems are considered more effective. Oftentimes filtration is combined with disinfection because filters are susceptible to bacterial growth. Additionally, it is common to filter water prior to using UV treatment systems to ensure sediment does not block the UV light. Another water treatment option is reverse osmosis (RO), provided that the RO unit has an absolute pore size of one micron or smaller and is certified by the National Sanitation Foundation (NSF) or Water Quality Association (WQA) for *Giardia*. NSF and WQA are independent associations that certify water treatment equipment for effectiveness, and it is always recommended to verify treatment equipment has been certified by either of these organizations for the contaminant of concern prior to purchasing equipment.

For more information on *Giardia*, Giardiasis, and water treatment methods, consult the Extension Publication, [Removing Giardia Cysts from Drinking Water](https://extension.psu.edu/removing-giardia-cysts-from-drinking-water)(<https://extension.psu.edu/removing-giardia-cysts-from-drinking-water>).

## References

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### Expertise

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