

Bacteria, Viruses, and Parasites in Drinking Water

Bacteria are everywhere in our environment, including Minnesota's surface waters and groundwater. Some of these bacteria can be harmful to human health. Drinking water with disease-causing bacteria, viruses, or parasites (collectively called pathogens) can make you sick. It is not practical to test drinking water for every type of pathogen, but it is simple to test drinking water for coliform bacteria. The presence of coliform bacteria can indicate there may be harmful pathogens in the water.

Health Effects

The presence of coliform bacteria, specifically *E. coli* (a type of coliform bacteria), in drinking water suggests the water may contain pathogens that can cause diarrhea, vomiting, cramps, nausea, headaches, fever, fatigue, and even death sometimes. Infants, children, elderly people, and people with weakened immune systems are more likely to be affected by pathogens in drinking water.

How to Protect Yourself and Your Family

The U. S. Environmental Protection Agency (EPA) requires public water systems to regularly test water for total coliform bacteria and *E. coli*. Safe drinking water does not have *E. coli* or other pathogens in it.

If you have a private well

Here are some recommendations on how to prevent and address coliform bacteria contamination:

Prevent contamination

- **Construct your well in a safe spot.** See *Protecting Your Well* for guidance.
- **Regularly inspect your well for damage** (see *Protecting Your Well*). Contact a licensed well contractor if you find any damage (See *Licensed Well and Boring Contractor Directory*).
- **Test your well water every year for coliform bacteria.** You are responsible for regularly testing your well water. Minnesota Department of Health (MDH) recommends using an accredited laboratory (see *Search for Accredited Laboratories*). Contact the laboratory to get sample containers and instructions, or ask your county environmental or public health services if they provide well water testing services.
- **Disinfect your well with a chlorine solution** if floodwaters come within 50 feet of your well; your water changes in taste, appearance, or odor; or your well is opened for servicing. See *Well*

Disinfection for instructions or hire a licensed well contractor.

- **Regularly maintain potential sources of contamination**, such as household septic systems.

Address Contamination

If coliform bacteria are detected in your water, follow these steps:

- **Stop using the water for drinking cooking**, unless you boil it at a full rolling boil for a minute before using it. You can also use bottled water or water from a known safe alternative source.
- **Disinfect your well with a chlorine solution** (see *Well Disinfection*).
- **Test your well water** again after disinfection to confirm there are no coliform bacteria.
- You can use the water again, without boiling, once the well has been disinfected and the water no longer tests positive for coliform bacteria.

If you are on a public water system

Your public water system is regularly tested for coliform bacteria. The system will issue a public notice within 24 hours if it detects *E. coli*. The public notice will tell you what you should do to stay safe.

You can find the coliform bacteria test results for the system serving where you live by reading the system's water quality report (also known as a Consumer Confidence Report [CCR]). You can call your public water system to get a paper copy of your CCR, or you may be able to find it online (see *Consumer Confidence Reports*). If you want to find the coliform bacteria test results for a place besides your home, contact the water system serving that location.

Background Information

Fecal matter contains many pathogens. Common sources of fecal matter in our environment include sewers, septic systems, and animal wastes. Pathogens from these sources can get into our drinking water. Testing drinking water for coliform bacteria is a simple way to find out if there may be pathogens in the water. If water also tests positive for *E. coli* bacteria, the water has fecal matter in it.

Bacteria, Viruses, and Parasites in Minnesota Water

As an agricultural state, Minnesota has many farms and feedlots. Rural homeowners rely on septic systems to treat their household wastes. We have abundant wildlife, often in close proximity to people. Additionally, city sewer systems are aging and can leak. Fecal matter from any of these sources can get into lakes, streams, rivers, and sometimes groundwater. Minnesota's public water systems and MDH regularly test for coliform bacteria in public water systems and work together to correct problems if water tests positive for coliform bacteria.

All newly constructed drinking water wells in Minnesota are tested for coliform bacteria. If coliform bacteria are detected, Minnesota's Well Code requires the well contractor disinfect the well and confirm it is free of coliform bacteria before the well is put into use. Testing beyond this initial sample is the responsibility of the private well owner.

What MDH is Doing

MDH regulates public water systems by:

- Approving public water systems' construction and treatment plans.
- Enforcing the Safe Drinking Water Act.
- Testing public water supplies.

MDH regulates private and public wells and works with private well owners by establishing and enforcing *Laws and Rules* for proper *Construction of Wells and Borings* and *Sealing of Wells and Borings*.

MDH is also conducting a *Groundwater Virus Monitoring Study* to learn about the presence of viruses in Minnesota groundwater and what it means for public health.

What Other Groups are Doing

Minnesota Pollution Control Agency works with partners across the state to reduce animal and human waste entering Minnesota's waters.

Resources

- [Bacterial Safety of Well Water \(PDF\)](http://www.health.state.mn.us/communities/environment/water/docs/wells/waterquality/bacteria.pdf) (www.health.state.mn.us/communities/environment/water/docs/wells/waterquality/bacteria.pdf)
- [Construction of Wells and Borings](http://www.health.state.mn.us/communities/environment/water/wells/construction) (www.health.state.mn.us/communities/environment/water/wells/construction)
- [Consumer Confidence Reports](http://www.health.state.mn.us/ccr) (www.health.state.mn.us/ccr)
- [Groundwater Virus and Monitoring Study](http://www.health.state.mn.us/communities/environment/water/cwf/virus) (www.health.state.mn.us/communities/environment/water/cwf/virus)
- [Laws and Rules: Well Management Program](http://www.health.state.mn.us/communities/environment/water/wells/rules) (www.health.state.mn.us/communities/environment/water/wells/rules)
- [Licensed Well and Boring Contractor Directory](http://www.health.state.mn.us/lwcsearch) (www.health.state.mn.us/lwcsearch)
- [Protecting Your Well](http://www.health.state.mn.us/communities/environment/water/wells/construction/protect) (www.health.state.mn.us/communities/environment/water/wells/construction/protect)
- [Public Drinking Water Program: Enforcing the Safe Drinking Water Act](http://www.health.state.mn.us/communities/environment/water/factsheet/dwprog) (www.health.state.mn.us/communities/environment/water/factsheet/dwprog)
- [Septic Systems—Subsurface Sewage Treatment Systems](http://www.pca.state.mn.us/water/subsurface-sewage-treatment-systems) (www.pca.state.mn.us/water/subsurface-sewage-treatment-systems)
- [Sealing of Wells and Borings](http://www.health.state.mn.us/communities/environment/water/wells/sealing) (www.health.state.mn.us/communities/environment/water/wells/sealing)
- [Search for Accredited Laboratories](http://www.health.state.mn.us/labsearch) (www.health.state.mn.us/labsearch)
- [Well Disinfection](http://www.health.state.mn.us/communities/environment/water/wells/waterquality/disinfection) (www.health.state.mn.us/communities/environment/water/wells/waterquality/disinfection)

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08/06/2019R

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