

FACT SHEET: COLIFORM BACTERIA IN DRINKING WATER

Bacteria are microscopic organisms consisting of a single cell. Although they may live for only a few hours or days, bacteria can multiply rapidly, some as often as every 30 minutes. Some types of bacteria are beneficial, even necessary, to sustain life. However, other types of bacteria, as well as other microorganisms such as viruses, can cause disease.

What are coliform bacteria?

Coliform refers to a group of bacteria with common characteristics such as their rod-like shape and ability to ferment lactose (milk sugar) with gas production. They are widely distributed in nature and many are native to the intestinal tract of warm-blooded animals, including humans.

Total coliform generally refers to bacteria, both fecal and non-fecal in origin, in the genera *Escherichia*, *Enterobacter*, *Aerobacter*, and *Klebsiella*. Although most coliform bacteria themselves are harmless, their presence in a water sample may indicate that pollution has occurred. Hence, coliform bacteria are sometimes referred to as indicator organisms.

Sources of coliform bacteria in drinking water

Coliform bacteria are some of the most numerous organisms in the intestinal tract of warm-blooded animals, including humans. Because animal and human feces contain millions of coliform bacteria, the presence of coliform bacteria in a drinking water sample may indicate contamination from a sewer, septic system, feedlot, or barnyard.

Some coliform species are more commonly found in surface water, soil, or on plants. Bacteria could enter a well if the well has been flooded or if the well is not properly constructed to prevent surface or near-surface contamination from entering it. Coliform bacteria could also be introduced into a water supply during drilling of a well or during repair of the well, pump, or plumbing system. State law requires disinfection of a water supply after it has been constructed or repaired.

Health concerns

Many communicable diseases are transmitted through polluted water. These diseases include dysentery, typhoid fever, cholera, giardiasis, and hepatitis. Epidemics involving these diseases have caused the deaths of thousands of people around the world.

Coliform bacteria are almost always present in water containing pathogens (disease-causing organisms) and normally survive longer than the pathogens. Testing for each of these pathogens would be difficult, time-consuming, and very expensive. Testing for an indicator organism, such as coliform bacteria, is simple, quick, and inexpensive. In most cases, water that is free of total coliform bacteria is considered free of pathogenic bacteria.

Testing for coliform bacteria

Bacteria cannot be seen in water. The only method to determine the presence of bacteria in drinking water is to collect a sample in a sterile container and submit it to a qualified laboratory. The Washington County Department of Public Health and Environment provides sampling kits to County residents for testing well water. A nominal fee is charged for analysis for coliform bacteria and nitrate. For more information about this service, contact the Department of Public Health and Environment at 430-6655.

Because the presence of coliform bacteria in drinking water may indicate pollution, the water should be checked for other contaminants. Nitrate is a chemical compound that also indicates the sanitary quality of the drinking water. Water quality can change with time or after repairs to the well or plumbing system occurs. For this reason, well water should be tested every year.

Recommended drinking water standards

Coliform results are reported either as absent or present, or as the number of coliform organisms detected in a volume of water, usually 100 milliliters (mL). A negative result, indicating the absence of coliform bacteria, is preferred and is the drinking water standard established by the U.S. Environmental Protection Agency (EPA) and the Minnesota Department of Health. A negative result is usually reported as negative, not detected, less than 1 (for the colilert method and membrane filter test method), or less than 2.2 (for the multiple tube fermentation method). Total coliform bacteria should not be in the water and their presence indicates a potential pathway for contamination to enter the drinking water. ***However, E. coli bacteria were also tested for and were not detected in your well.***

You may drink the water. However, MDH guidelines indicate that you should consider alternate drinking water source (bottled water) until you disinfect your system. You can also consider boiling the water before use for drinking or cooking.

If you have specific health concerns, it is strongly recommended that you use an alternate source of water. The immunocompromised, the elderly, pregnant women, and children may be at increased risk if potentially harmful waterborne pathogens are present in the water supply.

Treatment of drinking water

If coliform bacteria are detected in your water supply, you should disinfect your well and plumbing system, and then retest the system. If coliform bacteria are still present after disinfection, the entire water supply should be inspected for defects by a qualified person. For more information, contact a licensed water well contractor or see the Washington County Health, Environment and Land Management Department ***Fact Sheet*** entitled "Disinfection of Private Wells."

A properly constructed and located water supply should provide water that is free of bacterial or chemical contamination. If treatment is necessary until a permanent source of safe water is obtained, boiling or continuous disinfection will destroy coliform bacteria; however, they may not be effective against some microorganisms such as viruses or ***Giardia***. If boiling is used, the water should be boiled for at least 1 minute and let cooled completely. However, since boiling will increase nitrate concentrations due to evaporation of some water, it is important that nitrate levels be known before this treatment method is used.