

Coliform Bacteria in Drinking Water Supplies

A copy of the [Coliform Bacteria in Drinking Water Supplies](#) is available in Adobe Portable Document Format (PDF, 762KB, 2pg.).

What are Coliforms?

Coliforms are bacteria that are always present in the digestive tracts of animals, including humans, and are found in their wastes. They are also found in plant and soil material.

"Indicator" Organisms

Water pollution caused by fecal contamination is a serious problem due to the potential for contracting diseases from pathogens (disease causing organisms). Frequently, concentrations of pathogens from fecal contamination are small, and the number of different possible pathogens is large. As a result, it is not practical to test for pathogens in every water sample collected. Instead, the presence of pathogens is determined with indirect evidence by testing for an **"indicator"** organism such as coliform bacteria. Coliforms come from the same sources as pathogenic organisms. Coliforms are relatively easy to identify, are usually present in larger numbers than more dangerous pathogens, and respond to the environment, wastewater treatment, and water treatment similarly to many pathogens. **As a result, testing for coliform bacteria can be a reasonable indication of whether other pathogenic bacteria are present.**

Total Coliforms, Fecal Coliforms, and E. Coli

The most basic test for bacterial contamination of a water supply is the test for **total coliform bacteria**. Total coliform counts give a general indication of the sanitary condition of a water supply.

- A. **Total coliforms** include bacteria that are found in the soil, in water that has been influenced by surface water, and in human or animal waste.
- B. **Fecal coliforms** are the group of the total coliforms that are considered to be present specifically in the gut and feces of warm-blooded animals. Because the origins of fecal coliforms are more specific than the origins of the more general total coliform group of bacteria, fecal coliforms are considered a more accurate indication of animal or human waste than the total coliforms.
- C. **Escherichia coli (E. coli)** is the major species in the fecal coliform group. Of the five general groups of bacteria that comprise the total coliforms, only E. coli is generally not found growing and reproducing in the environment. Consequently, E. coli is considered to be the species of coliform bacteria that is the best indicator of fecal pollution and the possible presence of pathogens.

Are Coliform Bacteria Harmful?

Most coliform bacteria do not cause disease. However, some rare strains of E. coli, particularly the strain O157:H7, can cause serious illness. Recent outbreaks of disease caused by E. coli O157:H7 have generated much public concern about this organism. E. coli O157:H7 has been found in cattle, chickens, pigs, and sheep. Most of the reported human cases have been due to eating under cooked hamburger. Cases of E. coli O157:H7 caused by contaminated drinking water supplies are rare.

Coliform Testing

Testing for bacteria is the only reliable way to know if your water is safe. You cannot tell by the look, taste, or smell of the water if disease-causing organisms are in it. The New York State Department of Health recommends that well owners test their water for coliform bacteria at least once a year. If you have experienced bacteria problems in the past, it is recommended that you test your well more frequently.

When Should I Test?

Late spring or early summer are the best times to test your well, since coliform contamination is most likely to show up during wet weather.

Whether your test results are positive or negative, understand that the sample you collected is just a "snapshot" of your well's water quality. The more samples you have tested, the more confident you can be about the quality of the water you are drinking.

What do the Results Mean?

If coliform bacteria are present in your drinking water, your risk of contracting a water-borne illness is increased. Although total coliforms can come from sources other than fecal matter, a positive total coliform sample should be considered an indication of pollution in your well. Positive fecal coliform results, especially positive E. Coli results, should be considered indication of fecal pollution in your well.

What Should be done if Coliform Bacteria are Detected in a Well?

When coliforms have been detected, repairs or modifications of the water system may be required. Boiling the water is advised until disinfection and retesting can confirm that contamination has been eliminated. A defective well is often the cause when coliform bacteria are found in well water.

What Kinds of Defects can Allow Contamination?

- **a missing or defective well cap** - seals around wires, pipes, and where the cap meets the casing may be cracked, letting in contaminants
- **contaminant seepage through the well casing** - cracks or holes in the well casing allow water that has not been filtered through the soil to enter the well. This seepage is common in the wells made of concrete, clay tile, or brick
- **contaminant seeping along the outside of the well casing** - many older wells were not sealed with grout when they were constructed
- **well flooding** - a common problem for wellheads located below the ground in frost pits that frequently flood during wet weather.

Long-Term Options for Dealing with Bacterial Contamination of a Well

- Connecting to the regional public water system, if possible
- Inspecting wells for defects and repairing them if possible
- Constructing a new well
- Installing continuous disinfection equipment
- Using bottled water for drinking and food preparation