

Coliform Bacteria in Water

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. 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. **As a result, testing for coliform bacteria can be a reasonable indication of whether other pathogenic bacteria are present.**

Why Test for Coliform?

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. It is recommended that well owners have their wells tested 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. Whether your test results are positive or negative, understand that the sample 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 does Bacteriological Analysis Determine?

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. If coliform is present, the sample fails and is then tested to see if Fecal and E. coli are present.

- 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. 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.

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 your well may be required. Boiling the water used for consumption, brushing teeth, cleaning dishes, etc. is advised until disinfection and retesting can confirm that contamination has been eliminated. You can use the water to shower but take care not to consume the water. A defective well is often the cause when coliform bacteria are found in well water.

What Kinds of Well Defects can Allow Contamination?

- **Missing or defective well cap** - seals around wires, pipes, and where the cap meets the casing may be cracked, letting in animals, insects or other 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 allowing water to flow down the outside of the casing and into the supply.

- **Well flooding** - a common problem for wellheads located below the ground that frequently flood during wet weather.
- **Changes in Water Table** – Changes in the water table can open or close solution channels that may lead to contamination.

How Can I Correct Bacterial Contamination of a Well?

- Disinfection and resampling of the well. Often the easiest solution.
- 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 such as a chlorinator or UV light if problems are persistent.
- Using bottled water for drinking, brushing teeth, and food preparation until the bacteriological issues are corrected.

How Can I Disinfect a Well?

If there is a positive analysis result, the well should be disinfected.

The instructions in the following link are a suggestion on how to disinfect your well. Care should be taken to ensure all power to the well is off and the proper amount of chlorine is applied. Failure to do so may result in serious injury or damage to equipment. It is a fairly simple procedure that can be done by the homeowner but as with anything, when in doubt, call a professional.

An additional coliform test is needed to insure the water is free of bacteria after the disinfection is complete.