Division of Drinking and Ground Waters
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Environmental Protection Agency

Coliform Bacteria in Drinking Water

Total coliform bacteria are naturally present in the environment and are used as an indicator that other potentially harmful bacteria may be present.

What is coliform bacteria, and how did it get into my water system?

Coliform bacteria are tiny (microscopic), long, skinny organisms found in the intestines and wastes of warm-blooded animals such as humans, dogs, and livestock. Coliform bacteria are a group of bacteria, not a single type of bacteria. They are usually associated with contamination by animal wastes and are used as indicator organisms in the testing of drinking water quality. An indicator organism is a microorganism that is relatively easy and quick to test for but is normally absent in drinking water.

It is cheaper, easier, and faster to test for total coliform bacteria than it is to test for all possible pathogens. The presence of this organism may indicate that contamination from animal wastes is entering the water, although total coliform bacteria do not necessarily cause disease themselves. If total coliform bacteria are found, it is assumed that disease-causing organisms (pathogens) may also be present.

How can I keep coliform bacteria from getting in my water system?

Repair all water line leaks. Leaks are holes in the water system that could allow contamination to enter and should be considered possible sources of contamination. Disinfect the system after completing any work on the system.

Well construction and well casing condition are very important in preventing the introduction of coliform bacteria into the water supply. Surface water (storm runoff, flooding of lakes or rivers) usually carries coliform bacteria and associated pathogens. It can also carry chemicals.

If surface water can enter the well or contact the drinking water system, contaminants can too.

Proper well construction and system maintenance should prevent the introduction of surface water into the well and the public water system. Improper construction, like the improper grouting of the well or well casing degradation (steel casings rusting out), could allow surface water to enter the well column. Improper grouting could allow the surface water to travel down the sides of the casing and enter the well through the rust holes or run down far enough to contact the aquifer itself, resulting in introduction of surface water into the well and the public water system.

Repair all water line leaks. Leaks are holes in the water system that could allow contamination to enter the water lines at times of reduced water pressure. Remember to disinfect the system after completing repairs.

Always follow appropriate sampling techniques. Occasionally, poor sampling techniques introduce bacteria into the sample container. In this instance, the water system could be safe but would be found to be contaminated because improper sampling techniques occurred. Contact your Ohio EPA district office for advice on proper sampling techniques.

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Without getting too technical, how do they test for total coliform bacterial?

Public water systems must use an Ohio EPA-approved laboratory to test for total coliform bacteria. A list of approved laboratories can be obtained through your Ohio EPA district office or at ***epa.ohio.gov/pws***. The total coliform bacteria sample is collected in a specially prepared container provided by the laboratory.

Chlorine in the water sample interferes with the accurate evaluation of water quality. To avoid this, this container has been sterilized and usually contains a chemical (either a white powder or pill) that ties up any residual chlorine present. Since the laboratory will be testing for a live organism, the test must be started within 30 hours of sample collection. The testing procedure normally takes about 24 hours.

The laboratory grows (incubates) the bacteria using special techniques and equipment, including special broth or media and specific incubation temperatures. If present, coliform bacteria will flourish. The laboratory then looks for gas or acid formation or may isolate and grow the bacteria on membranes containing a special nutrient media. A specially trained laboratory technician performs the test and documents the results.

How often should I test for total coliform bacteria?

Monitoring frequency is based on the source of the raw water (groundwater or surface water) and the population served by the public water system. Contact your Ohio EPA district office for the monitoring frequency for your facility. Yearly testing is recommended for private wells.

What is a safe number for total coliform bacteria in public drinking water?

Laboratories must report either presence (positive) or absence (negative) of total coliform bacteria. A positive test for total coliform bacteria in drinking water usually indicates that there is a problem and that pathogens may be present. So, the presence of any total coliform bacteria in the public water sample is considered unacceptable.

ZERO
The presence of any total coliform bacteria is unacceptable.

What are the potential health risks related to the presence of total coliform bacteria in drinking water?

The potential health risks could be as varied as the number and variety of pathogens present. Although total coliform bacteria could, by themselves, cause health problems (diarrhea, flu-like symptoms, headaches), the real concern is the likelihood of the presence of pathogenic bacteria and viruses. The more widely known disease-causing organisms are Escherichia coli and Giardia. The presence of total coliform bacteria could also indicate surface water contamination, including chemical pollution.

Can drinking water be treated to remove total coliform bacteria?

Normally, drinking water treatment for total coliform bacteria does not remove the bacteria but rather disinfects the water to kill the bacteria. Normal disinfection techniques include the use of chlorine or ozone. Contact the Ohio EPA district office staff for specifics about the applicability of various disinfection treatment techniques.

Contact

For more information, contact the Division of Drinking and Ground Waters at 614.644.2752 or your Ohio EPA district office at ***epa.ohio.gov/about/districts***.