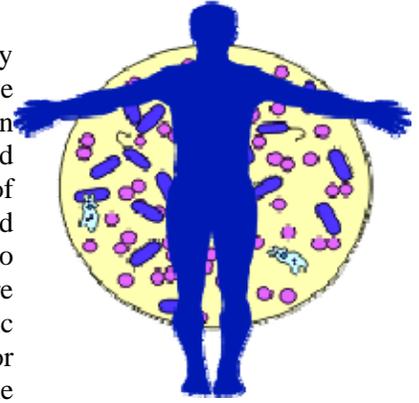


TOTAL AND FECAL COLIFORM BACTERIA

The coliform bacteria group consists of several types of bacteria belonging to the family *enterobacteriaceae*. These mostly harmless bacteria live in soil, water, and the digestive system of animals. Fecal coliform bacteria, which belong to this group, are present in large numbers in the feces and intestinal tracts of humans and other warm-blooded animals, and can enter water bodies from human and animal waste. If a large number of fecal coliform bacteria (over 200 colonies/100 milliliters or 200 cfu/100 ml) are found in water, it is possible that pathogenic (disease- or illness-causing) organisms are also present in the water. Fecal coliform by themselves are usually not pathogenic; they are indicator organisms, which means they may indicate the presence of other pathogenic bacteria. Pathogens are typically present in such small amounts it is impractical monitor them directly. For more information on E. coli and other pathogenic bacteria, see the [U.S. FDA Center for Food Safety & Applied Nutrition's "Bad Bug Book"](#).



Swimming in waters with high levels of fecal coliform bacteria increases the chance of developing illness (fever, nausea or stomach cramps) from pathogens entering the body through the mouth, nose, ears, or cuts in the skin. Diseases and illnesses that can be contracted in water with high fecal coliform counts include typhoid fever, hepatitis, gastroenteritis, dysentery and ear infections. Fecal coliform, like other bacteria, can usually be killed by boiling water or by treating it with chlorine. Washing thoroughly with soap after contact with contaminated water can also help prevent infections.

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Measurement of Fecal Coliform



Bacteria are single-celled organisms that can only be seen with the aid of a very powerful microscope. However, coliform bacteria form colonies as they multiply, which may grow large enough to be seen. By growing and counting colonies of coliform bacteria from a sample of water, it is possible to determine approximately how many bacteria were originally present. There are several ways coliform bacteria are grown and measured. Methods commonly used include the most probable number (MPN) method and the membrane filter (MF) method.

Factors Affecting Fecal Coliform



Wastewater and Septic System Effluent

Fecal coliform is present in human waste, so the bacteria goes down the drains in our houses and businesses, and can enter streams from illegal or leaky sanitary sewer connections, poorly functioning septic systems, and poorly functioning wastewater treatment plant effluent.

Animal Waste



A significant amount of fecal coliform is released in the wastes produced by animals. This can be a serious problem in waters near large dog kennels, cattle feedlots, hog farms, dairies, and barnyards that have poor animal keeping practices and waste is not properly contained. In urban areas, fecal coliform can be contributed to surface water by pet and human waste when it is carried into storm drains, creeks, and lakes during storms.



Sediment Load

High amounts of sediment are often related to high concentrations of pathogenic bacteria. Fast-running water can carry more sediment, so higher levels of bacteria can occur during high runoff events. Bacteria are typically much more abundant on soils than in water.

Temperature

Bacteria grow faster at higher temperatures and drastically slower at very low temperatures.

Nutrients

High levels of nutrients such as those in fertilizers can increase the growth rate of bacteria.

Water Quality Standards Regarding Fecal Coliform



The U.S. Environmental Protection Agency (EPA) requires all drinking water systems to monitor for total coliform in distribution systems. The EPA states that no more than 5.0% of samples can test positive for total coliform in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive). Every sample that has total coliform must be analyzed for fecal coliform. There cannot be any fecal coliform in drinking water ([U.S. EPA Office of Water current drinking water standards](#)).

Georgia Rule 391-3-6-.03, Water Use Classifications and Water Quality Standards, states that “For the months of May through October, when water contact recreation activities are expected to occur, fecal coliform (shall) not exceed a geometric mean of 200 cfu/100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours. Should water quality and sanitary studies show fecal coliform levels from non-human sources exceed 200 cfu/100 ml (geometric mean) occasionally, then the allowable geometric mean fecal coliform shall not exceed 300 cfu/100 ml in lakes and reservoirs and 500 cfu/100 ml in free flowing freshwater streams. For the months of November through April, fecal coliform (shall) not exceed a geometric mean of 1,000 cfu/100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours and not to exceed a maximum of 4,000 cfu/100 ml for any sample. The State does not encourage swimming in any surface waters since a number of factors which are beyond the control of any State regulatory agency contribute to elevated levels of fecal coliform.”



Source

Unless otherwise noted, information presented here was derived from:

Murphy, Sheila, 2007, *General Information on Fecal Coliform*, U.S. Geologic Survey Water Quality Monitoring Section, City of Boulder, Colorado Boulder Area Sustainability Information Network, April 23, 2007, <http://bcn.boulder.co.us/basin/data/FECAL/info/FColi.html> .