



Ask Dr. Lake

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In this issue, Dr. Lake discusses some of the health aspects of lake management.

Dr. Lake, My lake association collects samples from our lake for coliform bacteria. I know that these samples have something to do with whether or not the lake is safe to swim in. Can you tell me more?

If a lake association is interested in checking for possible sewage contamination in the lake, water samples are collected and sent to a New York State certified lab for coliform analysis.

Are coliform bacteria bad?

Coliform bacteria are what is known as an indicator organism. This class of bacteria are extremely common in the large intestines (or colon, hence the term coli-form) of warm blooded animals. For the most part, coliform bacteria are not disease-causing in humans and do not pose any health danger. However, the presence of coliform bacteria can indicate the presence of pathogenic (disease-causing) bacteria and viruses.

How do you test for coliform bacteria?

The analytical test involves collecting a water sample, usually from either a swimming area or water supply. The sample must remain sterile. It is very easy to contaminate a coliform sample after it has been collected. The sample is taken to the laboratory and is mixed with a growth medium that has special nutrients to encourage the growth of coliforms. The sample is incubated from one to three days, and the number of bacterial colonies that grow are counted.

Why is the coliform test a good indicator?

The number of coliform bacteria excreted in feces by just one person each day is about 10^{12} . This is a one followed by 12 zeroes, a pretty big number. With the current requirement of having no more than 1 coliform colony per 100 milliliters of drinking water, one gallon of untreated sewage would have to be diluted by 100 million gallons of water just to meet the standard! Coliforms are easy to grow in the lab and die off rather quickly in lake water. The latter attribute makes them a good indicator of recent sources of sewage pollution.

Are there different types of coliform tests?

Yes. The first type is the **total coliform** test. This test is not as specific for human wastes as the **fecal coliform** test.

There is also the **fecal streptococci** test. You can also culture specific types of pathogenic viruses and bacteria directly, but this is very expensive and only a few microbiological laboratories can conduct these tests.

If a coliform test from my lake exceeds the New York State standards, should I worry?

The occurrence at your lake of one high coliform sample now and then should not be a cause for alarm. If the standards are regularly exceeded at a particular location, some form of immediate track down should be undertaken, preferably under the supervision of local health officials. The coliform test is not perfect. The level of coliform bacteria can fluctuate from hour to hour, and it is influenced by weather conditions, water temperature, water currents and the natural die-off of the coliforms. Coliforms may also enter your lake via fecal matter excreted by other animals, such as dogs, cats, waterfowl and farm animals. Certain labs are capable of conducting tests that can pinpoint the type of animal that excreted the coliforms, but these tests are usually not needed.

You talked about coliforms in swimming areas. Should I be concerned with a high coliform count in my tap water?

Yes. One high count would be enough for Dr. Lake to suspect that something is really wrong with his water supply. An **immediate** investigation of your water system should be undertaken by qualified professionals before the water is used for potable purposes.

So, human sewage is not the only source of coliforms?

Right, coliforms tend to be high in urban and agricultural stormwater, since the feces of other animals can contaminate runoff.

How can I prevent contamination of my lake from bacteria and viruses?

Maintain your septic system! If your septic system is not designed or working properly, untreated wastewater will enter the lake. Also, work with your local government agencies to reduce stormwater inputs to your lake. Most municipalities are currently enacting stormwater management regulations. Get involved! The United States Environmental Protection Agency website has lots of useful information.