Spring 2013

Connections

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CMPT and our October Annual General Meeting

In February, CMPT sent out a survey to all participants to find out if there was a level of interest in participating in the CMPT's Annual General Meeting (AGM) which is held in October in Vancouver. The meeting would offer people attending the opportunity for questions, comments, suggestions and discussion. We thank all those laboratories that participated in the survey.

While most of the responses were made online, 10 per cent of the responses were sent by fax or email. We understand that not all laboratories allow for access to the internet and we appreciate those laboratories that went as far as sending an off-line copy in order to respond.

The laboratories were reasonably distributed throughout the provinces that normally participate in CMPT programs. We also noted that the survey responders were from all groups of laboratory professionals and there were representatives from all of the CMPT programs. We, therefore, believe that the responses represented a reasonable representation of the whole group.

About 9 percent said they would absolutely be interested and 25 percent thought they might attend. Thirty-three percent of responders indicated they were less likely to attend, while the remainder were certain they could not attend.

For some, the issue was funding and, for others, it was a matter of distance. It is interesting to note, however, that one of the responders who said they were likely to attend would be travelling several thousand miles. An additional challenge for some laboratories, especially the smaller ones, was that attending the AGM would mean to leave the laboratory short staffed. One responder suggested that we might consider transmitting the meeting electronically so that, if they cannot come to the meeting, perhaps we could bring the meeting to them.

We did not want to get into the "whys" or "why nots", but some laboratories did mention some issues that they would like to talk about if they were able to come.

When we asked that if we were to provide some added value to the meeting by supplementing it with a microbiology workshop, a site visit, or a Quality workshop, we noted that considerably more people responded more positively towards attending.

From our perspective, the responses were very helpful and we will almost certainly extend an open invitation to laboratories to send a representative to the next CMPT's AGM. It is clearly an opportunity for us to open up another avenue of dialogue.

We do understand some of the concerns and obstacles that have been raised and we will look into addressing some of them.

Unfortunately, we will not be able to fund laboratories to send a representative, but we certainly can provide laboratories with the opportunity to transmit questions prior to the meeting. We can also look into setting up telephone or internet communication, at least during the question period.

As added value, we will look into the possibility of an additional workshop to run in conjunction with the AGM. As a minimum, we will certainly be able to host a visit to our new CMPT laboratory on the UBC campus.

We will announce details of the AGM and plan an agenda of activities as we get closer to October. In the meantime, we thank all those that participated in the survey.

Dr. Michael A. Noble

CMPT Chair

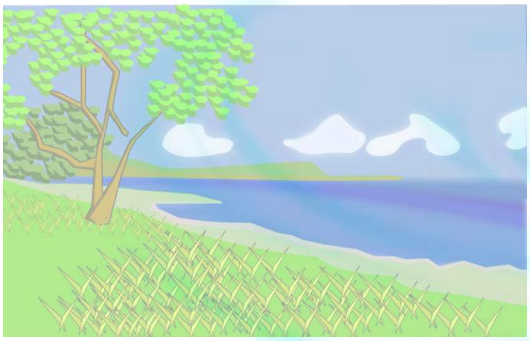
Microbiological Indicators of Water Quality

In our previous article, we talked about the public health implications of waterborne infections and why it is important to ensure drinking water safety. In this article we will briefly talk about the multi-barrier approach to water safety and in more detail about the use of microbial indicators to monitor the microbiological quality of water.

Although it is impossible to completely eliminate the risk of waterborne disease, a multiple barrier approach that **protects the source of water**, uses **effective water treatment methods,** properly **maintains the distribution systems**, and routinely **verifies drinking water safety** will provide greater assurance that drinking water will be clean and safe.

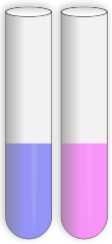
Source water protection is the first step of the multi-barrier approach and involves taking action to prevent contaminants from reaching the water sources such as municipal wells, rivers, or lakes.

Water treatment occurs before water enters the distribution system; drinking water undergoes a series of treatment processes to ensure the water is clean and safe to drink. These treatments are designed to remove water impurities and disinfect the water of any disease-causing bacteria, viruses, and parasites.



A well designed and maintained distribution system is also essential to ensure the drinking water reaches the consumer with the same quality it left the treatment process. Pipe maintenance, flushing and cleaning, water cycling within reservoirs, and additional disinfection stations along the way contribute to ensure the quality of the final product.

Water quality monitoring takes place throughout the whole system. Source water monitoring helps design the type of treatment needed and test treatment effectiveness and efficacy.



Monitoring within the distribution system ensures the quick detection and correction of any problems arising to ensure that water reaching consumers is clean and safe to drink.

As mentioned in our previous article, most of the water associated diseases are infectious in nature. A direct approach to monitoring the microbiological quality of water would be to detect microbial pathogens. However, monitoring pathogenic organisms in water is not practical. The presence of pathogens in water may be rare or sporadic, some of them may be difficult to culture, and a large number of detection assays would be necessary.

For these reasons, routine water microbiological analysis does not include the detection of pathogenic bacteria, but "indicator organisms".

Indicator organisms are essentially non-pathogenic, easily detectable microorganisms that share the same habitats that pathogens. Their presence indicate that contamination has taken place, which, in turn, may be a risk to public health.

As the greatest microbial risks are associated with the ingestion of water that is contaminated with human or animal feces, the ideal microbial indicator should provide a measure of the health risk associated with the ingestion of the tested water.

A good bacterial indicator should fulfill the following criteria

- Exist in high numbers in the human intestine and feces
- Not be pathogen to humans
- Be easily, reliably, and cheaply detectable

Additionally, if possible, these organisms do not multiply outside the enteric environment, exist in greater number than the pathogens, and have a similar susceptibility to disinfectants than pathogens.

Several fecal indicator bacteria in drinking water are currently in use. The most commonly used are fecal coliforms, *Escherichia coli*, and enterococci.

Total coliforms, fecal coliforms, and *E. coli*

Total coliforms are not necessarily a measure of fecal pollution and, indeed, can have no relation with this cause. There are non-fecal sources for many of these organisms and they may multiply in aquatic environments with sufficient nutrients and optimal temperatures.

Fecal coliforms (or thermotolerant coliforms) are traditionally defined as coliforms that ferment lactose at 44.5°C in a medium with bile salts. These bacteria live in the animal and human gut, but also in the environment. Their presence in polluted waters does not necessarily indicate fecal pollution and, as total coliforms, they may multiply in aquatic environments.

E. coli is the only reliable indicator of fecal pollution in environmental waters and is the only coliform that is found exclusively in the feces of humans and other animals.

The detection of *E. coli* in drinking water should lead to the immediate issue of a boil-water advisory and to corrective actions being taken.

The absence of *E. coli* in drinking water generally indicates that the water is free of intestinal disease-causing bacteria. However, in-

Total coliforms:

Coliform bacteria are facultatively anaerobic, gram-negative, non-spore-forming, rod-shaped bacteria that ferment lactose with gas and acid production in 24 to 48 hours at 35°C. Coliform bacteria belong to the family Enterobacteriaceae and include *E. coli* as well as various members of the genera *Enterobacter, Klebsiella,* and *Citrobacter.*

Thermotolerant (fecal) coliforms:

These bacteria conform to all the criteria used to define total coliforms plus the requirement that they grow and ferment lactose with the production of gas and acid at 44.5°C +/- 0.2°C .

testinal viruses and protozoa are more resistant to disinfection and can be present even when *E. coli* is not detected.

Enterococci

Fecal enterococci are present in high numbers in human feces, are able to survive longer in environmental water, and are more resistant to drying and chlorination than *E. coli*. As enterococci are also present in many foods of animal origin, caution should be taken when using them as water quality indicator organisms.

Clostridium perfringens

C. perfringens has the advantage of being exceptionally resistant to disinfection processes such as chlorination. It is present in higher numbers in the feces of some animals than in feces of humans, but the numbers excreted are substantially lower than those of *E. coli*. Testing for the spores of *C. perfringens* can probably provide an added margin of safety to the monitoring process.

Non-gastrointestinal infections related to recreational waters are usually caused by naturally occurring waterborne bacteria, such as *Legionella* species, *Aeromonas hydrophila, Pseudomonas aeruginosa,* and *Staphylococcus aureus* (these bacteria cannot be ruled out by using fecal indicator bacteria).

There is a need for an indicator of water quality that addresses these types of infection rather than gastrointestinal infections.

Pseudomonas species

Members of the genus *Pseudomonas* have been proposed as indicators of recreational water quality. *P. aeruginosa* has been found to be quite resistant to the ozonation processes and, thus, it has been useful in the analysis of recreational waters such as swimming pools, which receive chemical disinfection.

It is important to understand that no single organism can serve as an adequate indicator for all types of water, all routes of exposure, and all monitoring purposes.

Veronica Restelli

Editor

Next Issue: Methods for Microbiological Monitoring of Water quality

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The Spring 2013 edition of the Enhanced Water Quality Assurance (EWQA) Bulletin, an e-update to keep Provincial Health Officer (PHO) approved drinking water testing laboratories and partners informed about EWQA activities, is available here.

POLQM
Quality Management Conference

Organized by the Program Office for Laboratory Quality Management
Department of Pathology and Laboratory Medicine,
University of British Columbia

Marriot Renaissance Hotel
Vancouver, British Columbia
October 16—18, 2013

CMPT's new Location!

CMPT has moved!!!

Please update your records. Effective January 29th, CMPT's new home is located at the UBC campus:

Room G408, 2211 Westbrook Mall,
Vancouver, BC
V6T 2B5 Canada

Our phone and fax numbers have also changed:
Phone: 604– 827-1754
Fax: 604-827-1338

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Upcoming Events

June

63rd Annual Conference of the Canadian Society of Microbiologists

June 17—20, 2013 Carleton University, Ottawa, ON

More info: http://www.csm-scm.org/english/conf_upcoming.asp

July

FEMS 2013—5th Congress of European Microbiologists

July 21—25, 2013 Leipzig, Germany
More info: http://www2.kenes.com/fems2013/pages/home.aspx

October

6th Trends in Medical Mycology

11-14 October, 2013 Copenhagen, Denmark
More info: http://www.timm2013.org/en/Home_10_6_12.html

POLQM—Quality Management Conference

October 16—18, 2013 Vancouver, BC
More info: http://www.polqm.ca

July 2014

IUMS—International Union of Microbiological Societies Congresses

July 27 – August 1, 2014 Montreal, Canada
XIVth International Congress of Bacteriology and Applied Microbiology
XIVth International Congress of Mycology
XVIth International Congress of Virology
More info: http://www.montrealiums2014.org

ABOUT CONNECTIONS

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