

# **IDEXX**

## **Literature Cover Sheet**

**IDEXX Library #: 5AA**

**Topic:** IBWA Colilert Recommendation

**Title:** “Spotlight On Microbiology – Approved Coliform Methods Provide Options to The Bottler”

**Author(s):** Bob Hirst, Director, Technical Affairs

**Date:** August/September 1999

**Source:** IBWA Technical Bulletin, Volume 19, Number 13 Page 5 and 11

**Highlights:**

- “Since FDA and IBWA do not directly approve coliform test methods, the USEPA-approved methods are generally cited.”
- Colilert, Colilert-18 and Colisure are “approved for use” and are the most rapid, easy to use, easy to learn, and do not require skilled technicians for interpretation of results.
- “For most bottlers, the most convenient and easy-to-use methods are preferable.”
- DST methods “are usually more effective when higher heterotrophic plate counts (HPCs) are encountered as HPC bacteria do not interfere with interpretation of results.”
- IBWA offers DST training at their annual meeting.



# TECHNICAL BULLETIN

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## PROVIDING INFORMATION TO OUR CUSTOMERS THROUGH BOTTLED WATER QUALITY REPORTS: AN IBWA RECOMMENDED TEMPLATE

– Cindy A. Yablonski,  
Vice President, Research, Science and Technical Affairs

– Joe Findaro,  
IBWA Legislative Counsel

When community (public) water systems begin to distribute consumer confidence reports (CCRs) to customers in October 1999, it is anticipated that there will be a heightened level of interest about water quality issues among tap water as well as bottled water consumers. IBWA members should continue to provide bottled water quality information to their customers. The association's bottled water quality report template is a useful tool that can be used to enhance IBWA members' current reports.

### Background on Recent Federal Actions

The Safe Drinking Water Act amendments of 1996 (SDWA) required the EPA Administrator to issue regulations on "consumer confidence reports" for community water systems. EPA finalized its Consumer Confidence Rule on August 11, 1998, mandating community water systems to provide their customers with annual consumer confidence reports on the quality of the water delivered. Many water utilities across the nation have already been providing these reports to their customers. While states such as California already had requirements for such reports, the new federal mandate is more comprehensive.

The SDWA also required the FDA to conduct a study of the feasibility of appropriate methods, if any, of informing customers of the contents of bottled water. This study is examining whether bottled water producers should be required to issue reports similar to consumer confidence reports required of community water systems. The FDA study has not yet been completed although the statutory time deadlines have passed

for publication of both the draft and final studies. IBWA is continuing to closely monitor any developments at FDA and will keep members informed of any progress in a timely manner.

### Bottlers Will Continue to Provide Water Quality Information to their Customers

Municipal consumer confidence reporting is not relevant to bottled water given the high level of regulation to which bottled water products are subject and the high level of information that is currently available regarding our products. Bottled water producers are already required to provide information about product source, manufacturer, and contents under the FDA's labeling requirements. Bottled water consumers can obtain additional information about product composition, including detailed product analysis and product quality information, upon request of the manufacturer who is identified with necessary contact information on the product label.

Bottled water products are one of the most highly regulated food products sold. It would be inappropriate for the federal government to single out one food product for the same type of reporting requirements mandated for tap water. In fact, many food products contain water as a primary ingredient.

### IBWA Recommends that all Members use our Template to Enhance their Current Individual Company Water Quality Reports

Given the SDWA requirements and the activities of the EPA and the FDA, IBWA members should continue to make available, upon request

from their customers, comparable water quality information at the same time as the community water systems distribute their consumer confidence reports.

While IBWA members have always been willing to provide such information to our customers upon request, it is time for our industry to become even more proactive. Thus a model template has been prepared for our members to use that should be completed by October, 1999 and updated on an annual basis from July 1, 2000 into the future.

All of our members are encouraged to examine their current water quality reports, and to use the IBWA template to enhance their current reports. Moreover, IBWA continues to encourage bottlers to include either a local or toll-free number on their product labels to assure that consumers have easy access to water quality information.

Although bottled water is a food product, regulated by the FDA, it will be helpful for all bottlers to continue to provide product information to consumers using this type of template because bottled water will continue to be compared to tap water in the public arena.

### The proposed template for IBWA members to use in conveying product water quality information to the customer follows.

(IBWA members may view this template on the members only section of IBWA's association's web site: <http://www.bottledwater.org>.)

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## SPOTLIGHT ON MICROBIOLOGICAL TESTING

*Approved Coliform Methods Provide Options to the Bottler* – Bob Hirst, Director, Technical Affairs

There has been much discussion lately about microbiological testing of bottled water, some of it misleading or inaccurate. In addition to claims made regarding quality and safety, there have been issues raised about which total coliform methods are appropriate or more effective in testing bottled water. IBWA has received numerous inquiries regarding approved methods and benefits and advantages associated with each. Since FDA and IBWA do not directly approve coliform test methods, the USEPA-approved methods are generally cited. The following information is provided to assist bottlers in selecting the methods best-suited for their operation and water. Three methods (multiple tube fermentation, membrane filtration, and presence/absence) involve lactose fermentation while more recent methods are referred to as "DST" (defined substrate technology). The following is a brief discussion of each.

The oldest method approved by EPA is multiple tube fermentation, commonly referred to as the MPN method. This method involves preparation of several tubes using serial dilutions appropriate for the type of water being tested. This technique has been used for all types of water, including wastewater, surface water, ground water, and drinking water. The required incubation period is 24-48 hours for coliform. The results are expressed as "most probable number" (MPN), derived from examination of tubes exhibiting gas production and turbidity, and reference to a table published in *Standard Methods* and the USEPA's *Microbiological Methods for Monitoring the Environment*. Additional testing, requiring another 24-48 hours, must be completed to confirm samples that exhibited growth in the original tubes.

The membrane filtration (MF) technique employs the use of 0.45 um pore diameter acetate filters through which 100 ml of sample is filtered then placed in a petri dish containing coliform-specific growth medium, such as m-FCO broth or agar. The plate is incubated for 24 hours, after which it is examined for growth of bacteria colonies. Coliform

organisms, such as *E. coli*, generally exhibit characteristic "green sheen" colonies when present. Some atypical coliform organisms may produce colonies that appear light to dark red on the plate. All suspected coliform growth must be confirmed using lauryl tryptose broth (LTB) and brilliant green bile broth (BGB). *E. coli* confirmation can be accomplished using EC/MUG broth or agar. Confirmatory testing usually requires an additional 24-48 hours to confirm the presence of fecal coliform or *E. coli*. Positive results for *E. coli* are indicated in EC/MUG by turbidity in broth tubes, gas production, and a characteristic bluish-purple fluorescence when exposed to UV light.

The third general category of coliform testing, DST (defined substrate technology), employs a growth medium that provides the convenience of single step testing for presence or absence of coliform organisms and confirmation of presence of fecal coliform or *E. coli* when coliform organisms are present. The procedure involves pouring 100 ml of sample into a pre-sterilized plastic container and adding prepared powdered growth medium. After mixing, the entire container is incubated at 35°C for approximately 24 hours (exact incubation period is determined by the product used). A media color change indicates the presence of coliform organisms. To confirm for *E. coli*, the sample is then exposed to UV light. Once again, the characteristic fluorescence indicates a positive result for *E. coli*. No additional confirmatory testing is required. Available products include Colilert, Colilert-18, and Colisure.

Benefits and drawbacks are inherent in each of the above methods. For example, MF enables the microbiologist to quantify results in samples and permits isolation and confirmation of individual colonies. Isolation of colonies also facilitates more direct speciation of organisms when desired. On the other hand, MPN and MF methods generally necessitate the services of a skilled microbiologist for complete interpretation or speciation, and require up to 48 hours or



The International Bottled Water Association (IBWA) publishes the IBWA Technical Bulletin three times a year. For further information about the material appearing in this newsletter, please contact one of the Editors.

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**TESTING; continued from page 5...**

more to complete when coliform organisms are present. When elevated HPC counts are encountered (>500 cfu), MF results may be adversely affected.

In contrast, the DST methods provide rapid turnaround of results in approximately 24 hours. These methods are usually more effective when higher heterotrophic plate counts (HPCs) are encountered as HPC bacteria do not interfere with interpretation of results. The methods are easy to use, easy to learn, and do not require skilled technicians for interpretation of results. Speciation, when desired, can be achieved using these methods, but involves transfer of sample from the DST medium to another growth medium, such as an agar or nutrient broth, additional incubation, and isolation and culturing of colonies to accomplish species identification.

Most situations in daily bottled water operations do not call for detailed analysis of microbiological samples. Existing regulations are concerned primarily with the presence or absence of coliform organisms. Detection of even one fecal coliform organism constitutes a sample out of compliance with established coliform standards for drinking water. For most bottlers, the most convenient and easy-to-use methods are preferable.

For more information, we encourage you to attend the workshop entitled "Hands-On Lab Training" at the 41st Annual IBWA Convention and Trade Show in New Orleans. Microbiological methods will be presented with a hands-on demonstration of the DST methods included. The workshop is scheduled for Friday, November 12, 1999 at 9:15 am, and will earn CPO attendees 1.5 CEU toward renewal of their CPO certification.

Although approved for use, not all of the methods discussed here are addressed in the current IBWA Technical Training Course Manual (6/96 revision). The new Technical Manual, slated for release next year, will include all methods approved for use.

For more information, contact IBWA technical staff at (703) 683-5213.

**Just Announced...**

**Two Additional HACCP Workshops and CPO Examinations**

IBWA's Technical Department is pleased to announce the addition of two HACCP Workshops and CPO examinations to this year's schedule:

October 5, 1999 - NSF International, Ann Arbor, MI

HACCP Workshop (6 IBWA CEUs).....8:00 am – 3:00 pm  
 CPO Examination .....3:00 pm – 6:00 pm

October 14, 1999 – California BWA Fall Meeting, Location TBA

HACCP Workshop (6 IBWA CEUs).....8:00 am – 3:00 pm  
 CPO Examination .....3:00 pm – 6:00 pm

**Don't forget these previously scheduled workshops, seminars and examinations:**

September 16-17, 1999 – Northeast Bottled Water Association, White Plains, NY

CPO Examination .....9/16/99, 1:00 pm – 4:00 pm  
 HACCP Workshop (6 IBWA CEUs).....9/17/99, 9:00 am – 4:00 pm

November 10-13, 1999 – IBWA Annual Convention and Trade Show, New Orleans, LA

Technical Training Course Review.....11/11/99, 2:00 pm – 5:00 pm  
 HACCP Seminar (3 IBWA CEUs) \* .....11/12/99, 2:00 pm – 5:00 pm  
 CPO Examination .....11/13/99, 9:00 am – 12:00 pm

(\* Abbreviated session, 3 hours/3 IBWA CEUs)

**For more information, contact IBWA technical staff at (703) 683-5213.**