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This presentation is used with
Lesson Plan 13: Quality Control in
the Drinking Water Quality Testing
Trainer Manual.

Available at

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Importance of Quality Control



Learning Expectations

1. Explain the importance of quality control in drinking water quality testing.
2. Describe aseptic practices, secondary contamination, and sterilization.
3. Discuss the importance of health and safety in drinking water quality testing.

Why Do We Need Quality Control?

- Minimize errors
- Ensure reliable and consistent test results

Differences in Test Results

- Differences in measurement
- Changes in environmental conditions (e.g., light, temperature, power supply)
- Human error (e.g., doing tests while tired)
- Interpretation (e.g., colour perception)
- Differences in chemical quality and equipment calibration
- Poor training leading to technical errors



Credit: CAWST

What Should be Included in a Quality Control System?

- Management - staff organization, job descriptions, responsibilities
- Documented standard operating procedures (SOPs)
- Staff training - sampling and testing
- Equipment calibration and maintenance
- Checking quality of reagents and culture media
- Validating test methods
- Record keeping
- Double checking and reporting results

Quality Control in Microbiological Testing

What is secondary contamination?

- Contamination of a sample or equipment with bacteria from skin, hair, environment, air, etc.
- Contamination from one sample to another (also called cross contamination)

How Do We Minimize Contamination?

- Use aseptic practices to:
 - Prevent contact with microorganisms and reduce secondary contamination
 - Protect the environment and people doing the testing



Credit: CAWST

Effective Aseptic Practices

- Never touch the inside of equipment
 - Sample containers, Petri dishes, measuring containers
- Wash hands with soap and water and/or hand sanitizer
- Cover cuts with waterproof plasters (band aids)
- Secure loose clothing and jewelry
- Wear personal protective equipment
 - Lab coat and eye protection



Credit: CAWST



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Quality Control for Microbiological Testing

- If testing more than one type of sample, test least contaminated first
 1. Filtered water (usually best quality)
 2. Stored water
 3. Transport water
 4. Source water (usually worst quality)
- Shake the water sample before plating
- Run a blank sample using sterile water for each 10-20 test samples

Sterilization

- Very important for microbiological testing!
- Sterilize ALL equipment between uses
 - Conventional oven: Heat at 180°C for 30 minutes
 - Boiling: Boil for 10 minutes
 - Autoclave: Heat at 121°C for 20 minutes
 - Pressure cooker: Heat for at least 30 minutes
 - Use a flame from a lighter to disinfect tweezers or Petri dishes
 - Use methanol to disinfect membrane filtration apparatus

Importance of Health and Safety

- Project implementer responsible to provide safety equipment and training
 - Fire extinguishers, safety glasses, gloves, first-aid kits, water safety and first aid training
- Technician responsible to use equipment and products properly
 - Read safety information of chemical reagents (e.g., arsenic, methanol)
 - Safely dispose of samples and waste