



Refreshing your laboratory's approach to positive and negative culture controls

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February 21, 2024

Agenda and overview

Objective: review and identify best practices for culture controls

1. What are quality assurance and quality control?
2. What are positive and negative culture controls?
3. What methods and materials are available for positive and negative culture controls?
4. What are the benefits of a refreshed approach to positive and negative culture controls?
5. Q&A

IDEXX

A refreshed approach to positive and negative culture controls

Executive summary

Establishing proper quality assurance (QA) and quality control (QC) practices is a core responsibility of any environmental laboratory team. While some laboratories hesitate to change established QA/QC practices, IDEXX has found that many water testing laboratories may be able to capture low-risk cost savings and efficiencies by refreshing their approach to one specific QA/QC practice: how they perform positive and negative culture controls. These benefits may be significant and will vary based on the laboratory's current approach (figure 1).

		Benefits of switching to IDEXX-QC				
		Cost savings	Time savings	Reduced risk	Reduced waste	Simplified ordering
Current approach	In-house cultures		●	○	○	○
	Built-in swab controls	○	○	○	●	○
	Controls from proficiency testing (PT) providers	●		○	○	○
	Controls from food or pharma provider			○	●	○

Figure 1. Assessing different control practices and the primary benefits (●) and benefits (○) they offer. Based on a review of the most popular on-market materials.

Any water testing laboratory interested in the benefits above should consider utilizing IDEXX-QC for positive and negative culture controls. IDEXX-QC kits contain traceable ATCC[®] and NCTC[®] strains and are purpose-built to meet certification and accreditation requirements.† Read on to learn how these fit-for-purpose kits can benefit your laboratory.

“Many labs could benefit from the professional perspectives shared in this document. The content will make lab managers think twice about doing things the way they always have. I anticipate a lot of labs will want to review their standard practices and consider changing to an all-around cleaner way of performing quality control.”
—Laboratory manager, large drinking water utility

This webinar is based on our recent whitepaper:
A refreshed approach to positive and negative culture controls

Your presenters



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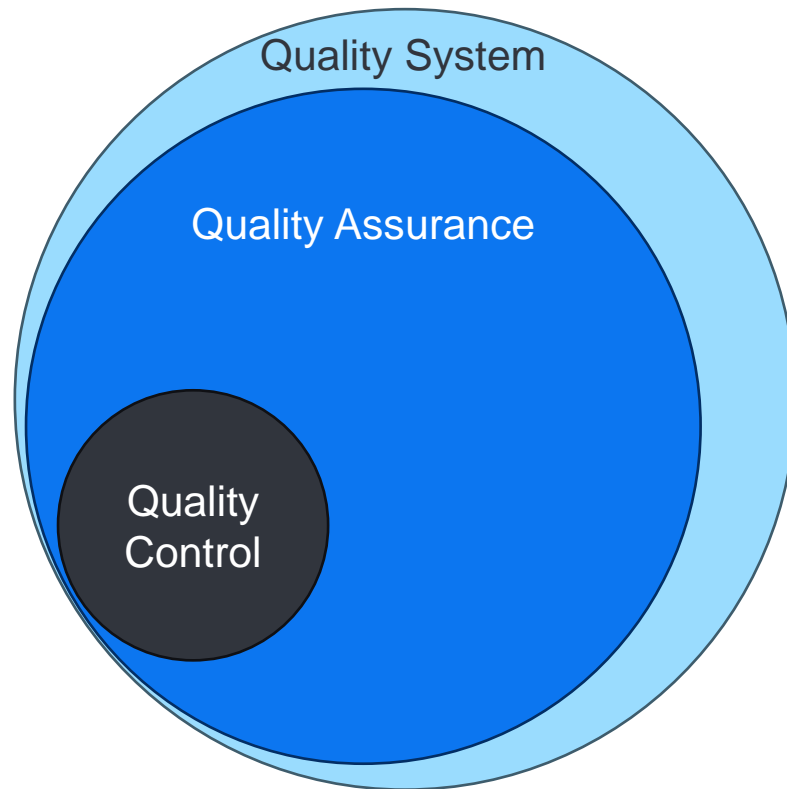
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Introduction to QA, QC, and positive and negative culture controls

Definitions of key quality terms



Relationships between quality terms

Quality System

- + Management system to define:
 - + Policies, objectives, principles, responsibilities, implementation plan

Quality Assurance

- + Management activities:
 - + Planning, implementation, assessment, reporting, improvement

Quality Control

- + Technical activities:
 - + Measuring the performance of a test against predefined standards
 - + Checking systems are within prescribed limits
 - + Operational techniques to ensure quality

Examples of quality assurance and quality control tasks

Quality Assurance

- + Defining quality responsibilities throughout the organization
- + Establishing acceptance criteria
- + Developing documentation requirements and forms
- + Defining continuous improvement processes
- + Ensuring the quality manual is being implemented as intended
- + Updating the quality manual

Quality Control

- + Check temperature of incubator
- + Recalibrate balances
- + Check sterility of sample bottles
- + Check dispense accuracy and precision of micropipettors
- + Standardize pH meter with at least 2 buffer solutions
- + **Check performance of media with positive and negative culture controls**

Source: Root, Hunt, Fjeld, and Kundrat, 2014; Standard Methods for the Examination of Water and Wastewater Section 9020

Positive and negative culture controls

Positive and negative culture controls verify method performance with target analytes

A positive control demonstrates the media detects **the target organism** (positive control must be known to contain only the target organism)

A negative control demonstrates the media does **not detect a non-target organism** (not a method blank)

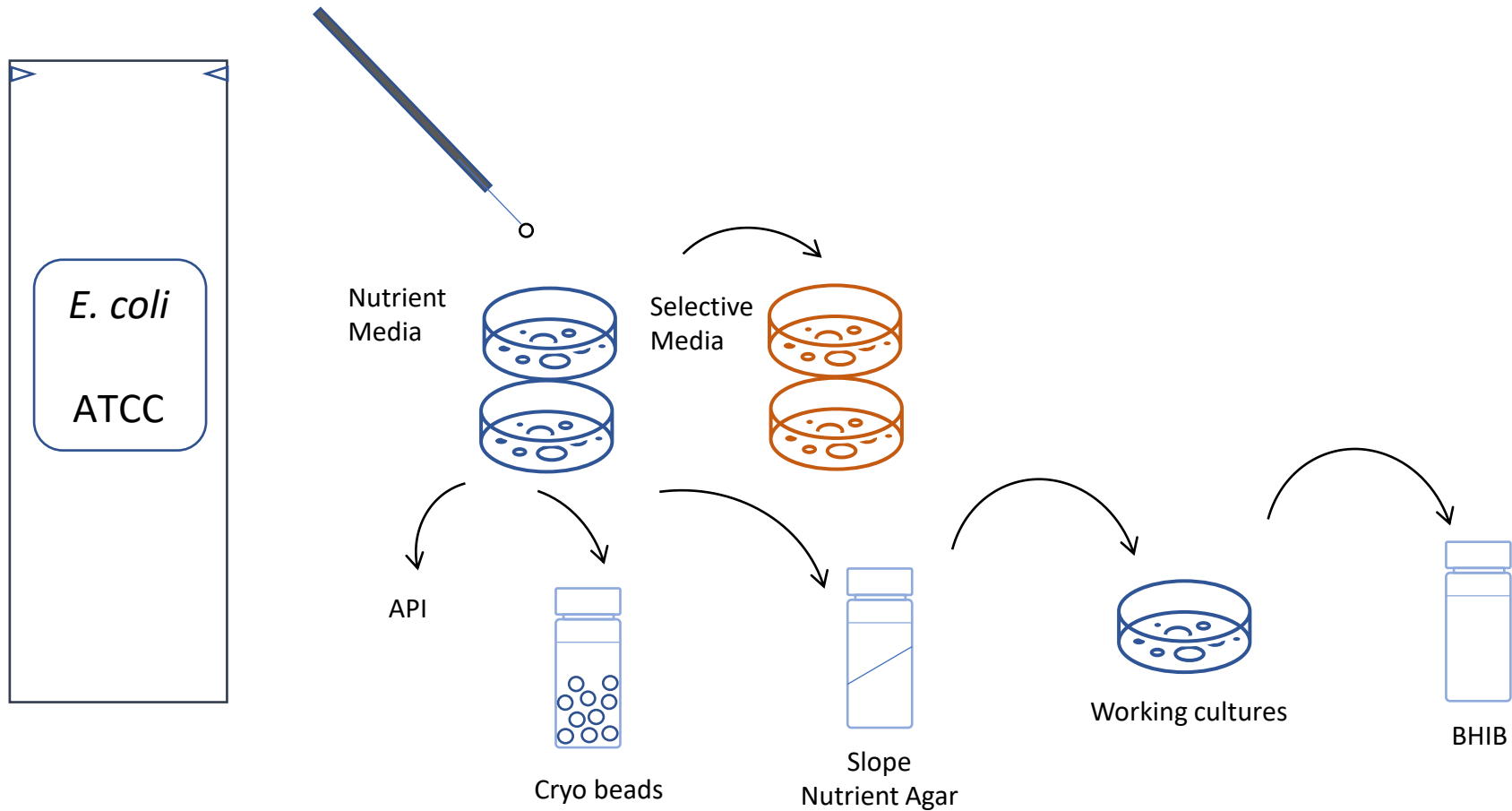


Colilert Presence/Absence



Methods for performing positive and negative culture controls

Maintaining in-house cultures



- + Many laboratories maintain cultures from ATCC or other stock cultures
- + Maintaining cultures can be cost effective for daily or weekly QC
- + The process should be performed by trained microbiologists

Controls with built-in swabs



- + Built-in swab products are often used to start working cultures, especially in other industries
- + Many water laboratories use these products to directly inoculate 100 mL of water
- + These products are robust, and feature an innovative design

Other controls

Controls from PT provider

- + Many PT providers offer the same materials they distribute as PTs as quality control materials
- + These materials are delivered in the same format as their PTs
- + Using these materials is essentially a “practice run” for your official PT

Controls from food/pharma provider

- + Many food and pharma microbiology providers offer known strains of bacteria
- + Water laboratories must know the specific strain they are looking for
 - + These catalogs can be quite large
- + These materials are often delivered in bulk formats (10-20)



A refreshed approach to culture controls: IDEXX-QC

IDEXX-QC kits



- Derived from ATCC and NCTC strains
- ISO 17034:2016 certified
 - Produced in a laboratory that is accredited to ISO 17025:2017
- Easy-to-use format
- Kits include all materials required for +/- control testing of IDEXX media
- Can be paired with PT testing
- Materials are quantified, with a target MPN and acceptable range
- Sold with 3 sets of each strain.
- Glass vials and paper boxes are recyclable.

Considerations around maintaining in-house cultures

Daily or Weekly QC

Purchasing “one shot” QC may be cost prohibitive

Consider using IDEXX SOP for maintaining in-house cultures

Monthly or Quarterly QC

Trained microbiologist maintaining cultures

or

Technician or other maintaining cultures

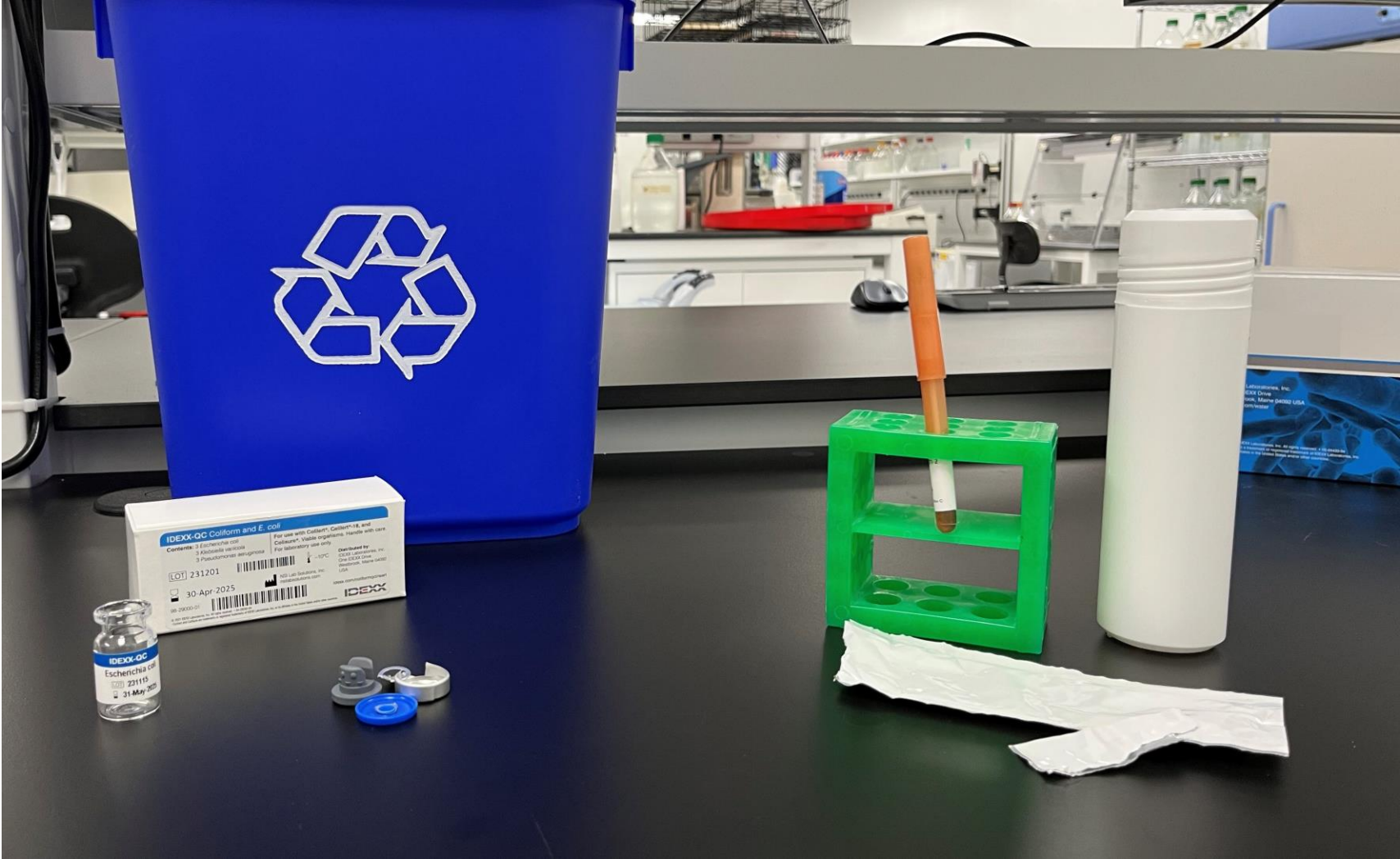
Consider opportunity cost of time vs. cost of “one-shot” QC

Consider risk and potential impact of errors




















Video: Built-in swabs and IDEXX-QC

Waste comparison between IDEXX-QC and built-in swabs



IDEXX QC: An easy, proven approach

	IDEXX-QC	Other PT providers	Food/Pharma providers	Built-in swab controls	In-house cultures
Derived from reference cultures					
Easy-to-use					
Minimal waste					
Quantified range					
Paired with PT					
Kit with specific materials required for QC of IDEXX media					
Input for in-house cultures		~*	~*		N/A



Q&A



To learn more: idexx.com/QCWhitepaper

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