

Improve Lab Efficiency and Workflow With Rapid Microbiological Methods

We've all heard the phrase – “Work Smarter, Not Harder”. What does this mean for the microbiology testing lab? It means streamlining your workflow to be as efficient as possible, while maintaining full sample and results traceability. Historically, this has meant manually labelling samples, culture plates, and coding results in some type of spreadsheet format for future reference. It also meant significant amounts of labor hours were spent on these processes – running the gamut from menial labeling tasks to complex, manual processes requiring high levels of technical training. With advances in technology, these traditional, labor-intensive operations can be transitioned to more automated, streamlined workflows.

What are the benefits of lab automation?

Laboratory automation offers many benefits. Method variability is reduced when replacing the human element with instrumentation. Often a 2- to 3-fold improvement in precision is obtained by automating a process. Labor costs can also be reduced twofold. First, automation can eliminate the need for additional laboratory personnel often required just to perform the repetitive, routine tasks in the lab. Second, an increase in employee satisfaction is often obtained, minimizing turnover and allowing lab technicians time to work on more analytical processes and results interpretations. Of course, the major gain is in lab throughput, which means a decrease in turnaround time for results, analysis, and report generation. This can mean significant efficiency gains for the laboratory and reduced overall test costs.



EnSURE® Touch and UltraSnap®

What hurdles will a food facility face when automating lab testing like microbial contamination?

Of course, there are a number of hurdles to overcome when automating laboratory testing, especially when automating food testing for microbial contamination. With a wide variety of matrices, sample sizes, and organism variations, each food type can have its own unique methodology for sample preparation and testing. Another issue is the uneven distribution of the target organism, requiring large sample sizes or homogenization of multiple samples to achieve the testing precision needed to ensure food is safe to eat. Last, a lab must select an efficient laboratory information management system (LIMS). The LIMS must be capable of ensuring efficient processing of all samples through all laboratory steps; it must also be capable of storing not only the obtained results but also sufficient information of each process step, enabling traceability and chain of custody.

What tests should the laboratory consider and when should these tests be run?

The lab must also consider the tests they run most often when automating processes. High-volume tests or tests performed multiple times a day should take precedent over occasional tests when establishing a plan for automation. This ensures the lab selects the activities that have the greatest impact on workflow efficiencies due to automation. In addition, the lab must determine what steps are easy to automate. For example, sample pipetting can easily be automated if processing large numbers in a similar format. In fact, liquid handling is the most common type of process that is automated. Another step that can be easily automated is data collection and processing. Often, highly technical assays and equipment can individually capture the relevant data and make pass/fail decisions based on established test criteria – but integration of all data into a single LIMS can be challenging.

When considering automation options, look for those manual processes that can be replaced with instrumentation and software capable of improving overall lab efficiency while maximizing method performance. Also consider the physical space in the lab – and build flow diagrams to help identify the best placement of equipment for maximum workflow outcomes.

Are there any simple automated tools for microbial testing?

Some automated tools for microbial testing are simple instruments that streamline testing data collection. Examples include: enzyme-linked immunosorbent (ELISA) assays and readers that feed results to an automated output system or link to a computer, polymerase chain reaction (PCR) assays and instruments that analyze results using sophisticated software and saving results to a computer, and rapid indicator testing for contamination such as adenosine triphosphate (ATP) monitoring devices that measure, store, analyze and share data via a cloud-based network or through integrated computer software.



Innovate™ Autosampler III

What rapid solutions does Hygiena® offer for environmental monitoring, commercial sterility and molecular diagnostics?

Hygiena® offers a broad portfolio of rapid testing solutions that support every stage of the environmental monitoring and product quality control - from surface hygiene verification and microbial enumeration to PCR-based pathogen detection and allergen control. Together, these systems streamline sample-to-result workflows and improve overall lab efficiency.

Environmental Monitoring and Hygiene Verification

- **EnSURE® Touch** serves as the central platform for rapid surface and water hygiene verification.
- Compatible with Hygiena's portfolio of ATP and enzyme-based tests:
 - **UltraSnap®** and **SuperSnap®** ATP Tests – verify cleaning effectiveness in seconds.
 - **AquaSnap®** Water ATP Tests – monitor CIP rinse or process water.
 - **ZymoSnap ALP** tests – confirm effective pasteurization and protein removal.

- All results sync automatically with **SureTrend®**, allowing users to trend data, identify recurring issues, and produce audit-ready reports across multiple facilities.

Rapid Microbial Enumeration

- **MicroSnap®** offers same-day results for **coliforms**, ***E. coli***, ***Enterobacteriaceae* (EB)**, and **Total Viable Count (TVC)**, reducing traditional plating time from 2–3 days to 6–8 hours.
- Results are captured directly in EnSURE Touch, allowing seamless analysis alongside ATP and enzyme test data.
- Ideal for in-process verification, environmental monitoring, and final product release decisions.

Molecular Diagnostics (PCR Pathogen Detection)

- The **BAX® Q7 System** delivers precise, PCR-based detection of major foodborne pathogens, including *Listeria*, *Salmonella*, and *E. coli* O157:H7.
- The **BAX® Prep Xpress** automates sample lysis and pipetting, reducing technician time and ensuring reproducibility.
- Integration with **SureTrend®** software allows unified visualization of pathogen and environmental results for comprehensive risk management.

Allergen Detection and Control

- **AlerTox®** and **GlutenTox® ELISA** kits provide quantitative allergen detection for gluten, peanut, soy, and other common food allergens.
- Paired with automated plate readers or handheld formats, these tests support both production verification and finished product testing.
- Results can be consolidated into a common data environment for facility-wide traceability and compliance documentation.

Rapid Product Screening for Dairy and Beverage Facilities

- The **Innovate™ System** enables high-throughput rapid microbial detection for ultra-high-temperature (UHT) and extended-shelf-life (ESL) products.
- The **Innovate Autosampler III** further automates sampling for up to 2,000 containers per hour, ensuring consistent and traceable results with minimal labor input.

Centralized Data Intelligence

- **SureTrend®** consolidates all test data from any instrument or source into a single, secure, cloud-based analytics platform.
- **KLEANZ®** provides tracking of all people, process and compliance data for your sanitation program, housing data in one digital location.
- From sanitation verification to PCR pathogen testing and allergen control, data can be visualized and trended in real time - turning individual test results into actionable insights.
- This integrated digital ecosystem gives QA and FSQ teams full visibility, enabling faster corrective actions, improved audit readiness, and continuous improvement across all sites.

Learn more at [hygiena.com](https://www.hygiena.com)