FOOD-SAFETY *fast track*

As the need for rapid testing increases, technology keeps up for processors who need to know

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From regulations to recalls and from traceability to training, there are many reasons why processors want to be sure their food-safety firewalls are in place and working properly. Rapid testing is one of the measures processors deploy in their efforts to ensure they are providing safe, quality products in the most efficient way possible.

Processors increasingly utilize a host of tests to check – and double-check – that their products and processing environments are free from harmful pathogens or, in the case of prepared foods, the presence of certain allergens. The need for tests that are both accurate and quick to read is driven by several converging factors.

More stringent regulations are one impetus. "The days of generic testing are over. When the Food Safety Modernization Act finally gets implemented, processors are going to have to have a HACCP plan and validate its efficacy through testing. And all of that required information has to be available immediately should an auditor ask for it," says William "Bill" Hogan, president and CEO of Food-Chek Systems Inc., in Calgary, Alberta, Canada.

Wendy Lauer, senior product manager in the Food Science Division of Bio-Rad Laboratories Inc. in Hercules, Calif., agrees. "With more food-safety regulations coming into place, processors need traceability and have to prove things were run," she points out.

More knowledgeable consumers are also a force to be reckoned with, as processors need to be able to verify and trace what they make and sell. "The consumer does have a lot to do with it now, and they are asking questions," Hogan notes.

Product-testing challenges

On the product-testing side, pathogens of concern remain proverbial bad bugs like *E. coli* (including the potent O157:H7 strain), *Salmonella* and *Listeria*. But other challenges related to certain microbes are on the minds of processors, too. "There does seem

to be a bit more focus on the antibiotic resistance of some organisms, like *Salmonella*. As such, there is growing interest in the ability to further identify the specific strains of the organism," observes Kurt Westmoreland, vice president of sales and marketing for Silliker Laboratories in Chicago, a subsidiary of Mérieux NutriSciences.

"Environmental sampling has become more important."

Nancy Eggink, technical service director for St. Paul, Minn.-based 3M Food Safety Department, cites other pathogens on processors' radar. "We receive inquiries for quantitative and qualitative *Campylobacter* methods. Additionally, some customers inquire about a quantitative *Salmonella* method," she says, adding that meat and poultry companies are also asking for additional tests, such as pathogen and indicator tests.

Tighter regulations, concerns over consumer confidence and the need to prevent recalls are also impacting processors' use of environmental testing. "There's an increasing emphasis on monitoring the manufacturing environment for the presence of *Salmonella* and *Listeria* on both food contact and non-food contact surfaces as the best way to indicate if plants are living up to requirements for cleanliness," Hogan explains.

Adds Lauer: "Environmental sampling has become very important – not only testing food but testing the processing environment."

As the need for testing grows throughout a plant, the ability to put the "rapid" in rapid testing has grown, as well.

"Ten years ago, using a molecular method had lots of steps and required a significant amount of training to correctly run the assay. Methods are now available that have fewer steps and are simple to use. Since 2004, improvements have been made in pathogen testing and indicator testing methods reducing the time from sample collection to final result," reports Eggink. Among 3M's new offerings are

FoodChek's new Actero enrichment media delivery products significantly reduce the time required for sample enrichment.

Bio-Rad's latest technology allows for automated sample preparation, delivering traceability and rapid results.

a Petrifilm Salmonella Express System, an all-in-one test and biochemical confirmation used for the detection of *Salmonella* in enriched foods and food-process environmental samples.

Enrichment times grow shorter

Meanwhile, enrichment times are growing shorter as processors seek to balance time and validation. "We are seeing test-kit manufacturers continue to push the limits on reducing TAT [turnaround time] in order to meet industry needs and expectations. In doing so, companies work with shorter enrichment times, reduced kit run times and as a result, 24-hour methods – or less in the case of *E. coli* O157:H7 – are available for the most commonly screened pathogens, *Salmonella* and *Listeria*, whereas 10 years ago, 48 hours was the most rapid method available," remarks Westmoreland. Silliker, for its part, has recently focused on further developing its chemistry services, including contaminant testing and mycotoxin testing, and its research services, such as shelf-life studies, strain identification, challenge studies, sensory evaluations, clinical trials and product comparison, he says.

Bio-Rad launched an automation system last year, a liquid-handling platform that automates sample preparation for detection by real-time PCR and gives processors the traceability and rapid results they need. "Real-time PCR is very sensitive and specific. Now, you don't need to enrich as long because you don't need as much bacteria to generate a positive result. All tests have environments of 24 hours or less," Lauer says, adding, "You can get accurate answers fast and then make decisions."

Hogan underscores the importance of quick, accurate results on the bottom line, citing FoodChek's new Actero enrichment media delivery products that significantly reduce the time required for sample enrichment. "By having speed plus accuracy, processors can be more cost effective. We have developed new products that enable processors to go above and beyond the status quo," he explains.

Chip Zerr, international QC manager for Rastelli Foods Group in Swedesboro, NJ, has used FoodChek's enrichment delivery product. "The time for enrichment is shorter and you get results earlier, so you can release the product sooner and improve customer satisfaction. It's not just in the lab – it affects the whole business," he says, adding that the test-and-release policy is pivotal for his company. "At the end of the day, if you do get a hit, if you have a test-and-hold program – you don't have a recall."

Even as testing gets faster, time should not be sacrificed for accuracy. "Without accuracy, a customer does not have good data to make important decisions about the safety and quality of that product," Eggink says.

Likewise, Westmoreland emphasizes the importance of maximizing time. "It is very important when using rapid methods to ensure the methods are validated, or verified, for the matrix for which they are being used. This documentation is needed to meet increasing regulatory requirements," he points out, adding that validation and verification data should be something test-kit manufacturers share with companies to ensure the data has been correctly assimilated. ■

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