

# LISTERIA testing results: It's about time

*A new food-safety technology delivers results with record speed.*



Jamaican sprinter Usain Bolt set an Olympic world record in the 100 and 200 meters, en route to claiming the title of fastest man in the world. In the food safety arena, FoodChek™ Systems Inc. (FoodChek) and DuPont Nutrition & Health have combined to shatter the 24 hour time-to-results barrier for *Listeria monocytogenes*, en route to becoming one of the fastest tests available in the industry.

Calgary, Alberta-based FoodChek and Wilmington, Delaware-based DuPont Nutrition & Health recently collaborated to introduce a combined testing method of a 20 hour enrichment in FoodChek's patented Actero™ *Listeria* Enrichment Media followed by two hours of sample preparation and processing with the DuPont™ BAX® System real-time PCR assays for *Listeria*. This has resulted in a 22 hour test for *Listeria*, significantly cutting the time to results for *Listeria* testing in environmental samples. The test will soon be certified as a Performance Tested Method by the AOAC Research Institute (AOAC-RI), a globally recognized third-party validation organization for food safety tests.

Meat and poultry processors using this test will experience significantly faster growth and detection of *Listeria*, meaning they will improve throughput and gain more control of their production operations, according to FoodChek and DuPont.

"This knowledge is critical to a company's ability to detect a microbiological issue before it affects finished product," explains Morgan Wallace, Senior Microbiologist and Validations Leader for DuPont Nutrition & Health Diagnostics. He notes that processors will also experience improved operational

efficiencies because of reduced holding costs with their products.

"Because of the long wait times associated with environmental *Listeria* testing, some meat and poultry manufacturers may elect to release product for shipment before the test results are confirmed. This exposes them to needless risks and the potential for a recall," Wallace says. "Other manufacturers may hold product until *Listeria* results are confirmed, incurring additional holding costs and a reduced shelf-life for their product once it is released."

This new, easy-to-use test will help processors in both situations by lessening the risk of shipped product reaching the market before results are available and significantly reducing the hold time required for product before test results are confirmed. According to William J. Hogan, President and CEO of FoodChek, food processors have been asking for faster time-to-results for *Listeria* testing, particularly during the enrichment phase, which can take up to 48 hours. Hogan says the combined test is a "game-changing breakthrough in global food safety pathogen testing for *Listeria*;" one that will set new standards for its rapid detection".

## Fast times

DuPont teamed up with FoodChek about a year ago to develop the test. DuPont liked the fact that FoodChek's Actero™ *Listeria* Media significantly accelerates sample enrichment.



*The DuPont™ BAX® System was the first automated pathogen detection system to use PCR technology in the commercial food industry. The BAX® System instrument amplifies bacterial DNA through a series of timed heating and cooling cycles that provide the ideal environment for repeated DNA replication. It also automatically detects the presence or absence of the target pathogen and provides clear "yes or no".*

## “Time is money”

“As a market-driven science company, DuPont works regularly with customers and food industry partners like FoodChek to create solutions that address global food safety challenges at both the local and global level,” says Nicolette Blubaugh, Marketing Communications leader for DuPont Nutrition & Health Diagnostics.

When customers combine the improved technology of the new BAX® System real-time PCR assays for *Listeria* with the optimized Actero™ *Listeria* Enrichment Media, the result is a fully enhanced testing method with very impressive results”, Hogan says. “FoodChek concentrated on a way to initially increase amplification of the *Listeria* bug,” he adds. “We saw that as a substantial way to improve the speed of the *Listeria* test.”

*Listeria* in food products or on food-contact surfaces is injured or stressed and requires increased enrichment time for detection, Hogan explains. FoodChek’s Actero™ *Listeria* Enrichment Media provides the ideal growing environment for *Listeria* to allow for accelerated, reliable growth and faster detection.

“It can take five to 10 hours for other media to prepare a stressed *Listeria* cell for growth,” Hogan says. “But Actero™ *Listeria* Enrichment Media has been optimized specifically for *Listeria* to speed up growth by several hours.” Using standard reference method media, the enrichment protocols for the BAX® System real-time PCR assays for *Listeria* require about 38 to 48 hours to complete, Blubaugh says.

“When samples are enriched in Actero™ *Listeria* Enrichment Media, enrichment times are reduced to just 20 to 24 hours depending on the food matrix, helping food producers to ship products to market faster while protecting their quality and their brands,” she adds.

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Each BAX® System assay targets a DNA sequence that is unique to the organism of interest - in this case *Listeria* - providing a stable, reliable indicator of whether the organism is present and vastly reducing the potential for cross reactions with similar organisms. “If the targeted DNA sequence is present in the sample, it is amplified by PCR and a fluorescent signal is created as the targeted DNA combines with the fluorescent probes or intercalating dye in the BAX® System assay. If the targeted DNA sequence is not present, then no detectable fluorescent signal is produced,” Wallace says.

### Positives for processors

“There are several benefits to processors of breaking the 24-hour barrier”, Hogan says. “Completing the enrichment phase in only 20 hours means that sample preparation can be standardized, leading to more efficiency on the production line.”

“Time is money,” Hogan says. Hogan uses this example: “A processor’s product hits the retail display case with a seven-day shelf-life. By the sixth day if the product has not sold, the price is dropped by as much as half. If it still does

not sell then, most retailers will discard it, significantly reducing the product’s profit margin.”

“Adding an extra day of shelf-life for the retailer to sell the product will make a big difference in bottom line sales profits. It is very significant if a processor can add another day of shelf life with the resulting financial win for both the processor and the retailer,” Hogan says. With food safety being top of mind for most consumers, food companies are discovering the benefits of marketing what they have done to ensure safe food. “Food security is an important issue around the world and will only increase in importance as the global population increases,” Blubaugh says.

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