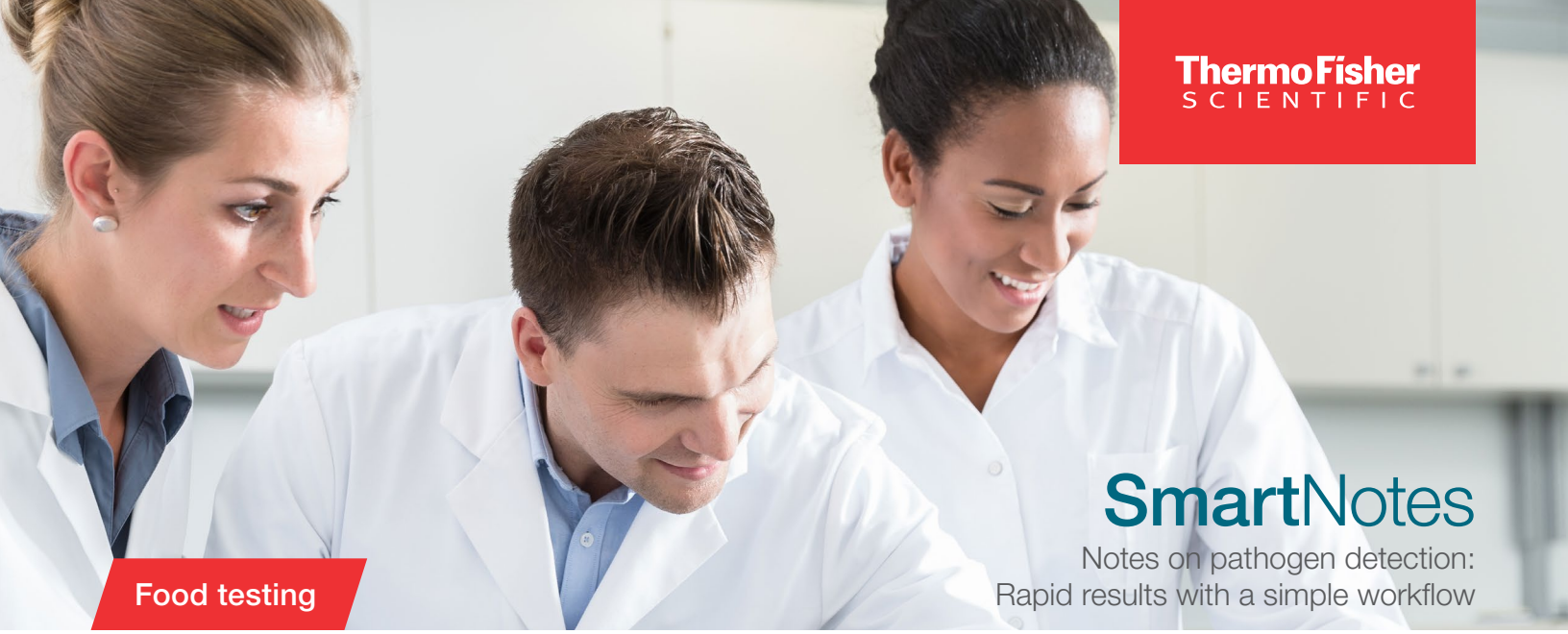

Food testing

SmartNotes

Notes on pathogen detection:
Rapid results with a simple workflow

Fast, accurate, easy to use system for foodborne pathogen detection

Why the Thermo Scientific™ SureTect™ PCR System could be the answer to your productivity challenges

Every business we work with is unique, but all share a common aim - to increase productivity without compromising on safety. Staff time is the most precious resource in any laboratory, wherever your work falls on the food supply chain.

It means that all our food testing customers, whether they are in primary production or retail, beef, poultry, or dairy, are united in their ambition to make the most of their technicians' time.

The Thermo Scientific™ SureTect™ PCR System, with its extensive range of assays for the detection of foodborne pathogens, is quick, easy to learn and requires minimal hands-on time. This allows for the streamlining of processes while still generating fast, accurate, actionable results.

The result is a productivity boosting system that provides more data and higher throughput with lower upfront effort.

Peace of mind

Food testing laboratories take their regulatory and business duties to screen their products for potentially dangerous pathogens, such as *Salmonella*, Shiga toxin-producing *Escherichia coli* (STEC), and *Listeria*, seriously.

In the United States, *Salmonella* alone causes 26,500 hospitalizations, and 420 deaths every year[1], whereas across Europe in 2019, 170 people died following an infection[2]. As well as the human cost, each one of these infections represents a significant business impact – *Salmonella* infection causes the poultry industry an estimated $2.8 billion in losses every year[3].

Recalling a product is expensive, costing an estimated average £30,000 a time, and can cause long-lasting brand damage. Research carried out by manufacturing infrastructure company Westgate found that 55% of consumers would switch brands, even if only temporarily, after a recall. Just over a fifth, 21%, said they would avoid the full product range, and 15% said they would never purchase from the company again[4].

For all these reasons and more, PCR testing has become a mainstay in food laboratories in recent years, thanks to its ability to return the rapid and potentially accurate results businesses need to make quick, informed decisions.

Sometimes, however, the modality's speed to result and high levels of accuracy can come at the expense of simplicity, and this can negatively impact on productivity.

The SureTect PCR System is different. The validated SureTect PCR assays workflows not only return robust, proven results between three and six days faster than culture media-based reference, but they use a simple workflow for a streamlined process. It means that SureTect allows technicians to concentrate on what they do best – eliminating risk from your business.

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Driving increased productivity

The simplified workflow of the SureTect PCR System drives increased productivity by reducing the time needed for both initial training and day-to-day hands-on interaction.

Training

Training technicians to use the SureTect PCR System workflow quickly and effectively is simple. This was demonstrated earlier this year, during the AOAC OMA validation study for the SureTect Salmonella Species Assay.

As part of the process, during which the method was successfully validated against the FDA-BAM and USDA-FSIS reference methods, an interlaboratory study, using cocoa powder, was conducted.

Due to COVID restrictions during the collaborative study, the team were unable to teach partners to use the workflow in person. Instead, they attended online, remote training sessions. Thanks to the SureTect PCR Assay's simple workflow, this approach was highly effective, despite the challenging nature of the sample.

And because the SureTect PCR System uses the same simple workflow across the different pathogen assays for the broadest range of matrices, one training process is all that is needed.

Hands-on time

The Thermo Fisher's R&D team of highly experienced scientists has built timesaving features into the SureTect PCR Assay workflow, from enrichment to report. All features have been designed to ensure laboratories make the most of their technician's time, while still delivering right-first-time results that can be relied on.

Depending on the targeted pathogen, enrichment takes between eight and 24 hours. The Thermo Scientific™ SimpliAmp™ Thermalcycler automates cell lysis with a "set it and forget it" approach, freeing up technicians to concentrate on other tasks rather than tying them into moving samples from incubation step to step.

Universal PCR sample preparation and cycling parameters enable a single workflow for all pathogen targets, meaning laboratories can test for *Salmonella*, *Listeria*, and other targets, simultaneously, while ready-to-use, pre-dispensed lysis reagents and lyophilized PCR pellets reduce manual preparation steps and potential for processing errors.

Together, these features add up to minimal transfer and hands-on time, without compromising on test performance and product safety.

Never compromising on accuracy

SureTect PCR System drives productivity while never compromising on accuracy. In fact, the platform's science is so robust it is effective in even the most challenging of circumstances: detecting *Salmonella* in cocoa, for example.

The difficulties associated with screening cocoa for *Salmonella* are well known. The low levels of moisture and fat content can make the organism difficult to revive during testing, while the naturally occurring phenols can inhibit PCR. It all adds up to a risk of false negative results, which could lead to potentially harmful products being released onto the market.

But the SureTect Salmonella Species Assay is AOAC OMA validated for cocoa – which was the subject of the processes' collaborative study element – meaning users can be confident in results from across the spectrum of available matrices.

Enrichment

Single enrichment step of 8-24 hours (depending on target and matrix)

Lysis

Direct lysis automatically carried out in Applied Biosystems SimpliAmp Thermal Cycler

Run & Read

Results automatically interpreted

Report/Confirm

Report PCR-negative results immediately and confirm PCR-positive results after overight incubation

A continual quest for increased productivity

When you work with Thermo Fisher, you are linked into to a global R&D powerhouse with access to the latest technology. When our expert teams find a new way to make your work simper, faster, smarter we share it.

We pride ourselves on constantly investing in our products, so that they evolve to better meet your needs.

In planning for the OMA validation process for the SureTect Salmonella Species Assay, for example, we audited commercially available rapid methods to search for unmet need. We found the sector required tools for larger sample size testing, and for more challenging and higher-risk products.

The OMA study, which included 32 matrices in all, also included 11 new matrices aimed at filling these gaps. As well as cocoa (up to 375 g), they tested 25 g samples of cut cabbage, cut mango, Cheddar cheese, feta cheese and cream, as well as up to 375 g of ground beef, beef trim, and spinach. The AOAC OMA scope covers a broad range of foods and selected environmental surfaces.

The SureTect Salmonella PCR Assay is also ISO 16140-2:2016 certified by AFNOR on a broad range of foods and production environmental samples, in order to comply with regulation reuqirements in most of the territories. Large test portions and multiple challenging matrices were assessed in the ISO validation scheme.

In short, Thermo Fisher never stands still. We are always striving to do better and to help you solve your productivity challenges.

SureTect PCR System: Easy to use, no matter how you use it

We have many customers, each with their own needs, objectives, and policies – but no matter where they are in the food supply chain, increasing productivity at the same time as confidence in results is the key to success.

The SureTect PCR System, with its simplified workflow, wide range of assays for foodborne pathogens is easy to use, flexible enough to be configured to your needs, and broadly validated to provide rapid, robust results.

No matter how you use it, the SureTect PCR System delivers the holy trinity of PCR: speed, accuracy, and ease of use.

1. https://www.cdc.gov/salmonella/
2. https://atlas.ecdc.europa.eu/public/index.aspx
3. https://meridian.allenpress.com/jfp/article/83/6/959/426022/Food-Attribution-and-Economic-Cost-Estimates-for
4. https://www.westgateuk.co.uk/news/the-cost-of-recalling-products-in-the-food-industry-infographic/

To find out more about the Thermo Scientific SureTect PCR System visit **thermofisher.com/suretect**

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