

# Microbiology Insider

Experts in the Field

2019

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Find out more about our microbiology focused industry events

# Screening for *Salmonella* in Meat Products

**In the fast-paced environment of meat processing, testing for pathogens is crucial to ensure the quality and safety of products at each step of the processing chain. The risk of contamination is especially high when it comes to raw meat, with *Salmonella* being the most frequently reported cause of foodborne illness. PCR, the most common testing method for *Salmonella*, often requires a sizeable investment and extensive training for its use.**

Reveal® 2.0 for *Salmonella* is a screening test which provides results in 24 hours, with minimal investment. Its accurate one-step testing protocol means that non-processed foods can be quickly analysed with low costs. The kits are also kept at room temperature so you don't need to worry about storage. This makes Reveal 2.0 for *Salmonella* an ideal tool for testing in meat processing facilities where there is a high risk of contamination, such as raw meat packing.

#### **NF Validation**

The test has received NF Validation by AFNOR certification for meat, dairy, egg, seafood and vegetable products (excluding dehydrated products and milk powders) according to ISO 16140-2.

Used as a screening solution, Reveal 2.0 for *Salmonella* reduces the time to results to 24 hours, with only 15 minutes of test development following enrichment. Using simple yet sophisticated lateral flow technology, the test is easy to perform with minimal sample touch time, lends itself to multiple food matrices and is scalable to any operation—from low volumes to theoretically unlimited throughput. Reveal 2.0 requires minimal equipment and low capital expense to begin testing ■

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# Response to *Listeria monocytogenes* Outbreak in Frozen Vegetables from Hungary



Insider speaks to Dr. András Sebök, General Manager at Campden BRI Hungary

**In summer 2018, it was announced that frozen corn was the likely source of a widespread *Listeria monocytogenes* outbreak that has been affecting many European countries, dating as far back as 2015.**

Whole genome sequencing was able to trace the same strains of *L. mono* in frozen vegetables processed by a Hungarian company over a three year period; suggesting that the strains have persisted in the processing plant despite cleaning and disinfection procedures.

#### **Increase in Environmental Monitoring**

In response to this, frozen vegetable manufacturers have taken a systematic approach in reviewing their sites

including zone segregation, factory layout, process flow and cleaning practices to assess and reduce the risk of *Listeria* within their sites.

The frequency of monitoring the factory environment and finished products for *Listeria* was also increased significantly.

#### **Auditing Service Implemented**

To determine the efficiencies of these improved control measures, Campden BRI Hungary, a founding member of the Hungarian Freezing and Canning Industry Association (MHKSZ), were appointed to perform factory audits; based on their extensive industry knowledge and experience in frozen food technology. Following initial 'fact finding' audits during the 2018 production season, non conformities were reported and further corrective actions deployed.

#### **Best Practice to Avoid Cross Contamination**

As there are so many possible routes of pathogen transmission within a food processing site, it is important for manufacturers to be aware of potential cross contamination risks. "Best practice to



avoid cross contamination issues include frequent testing of the environmental samples and finished products" says Dr. Sebök, "The speed, accuracy and reliability of the testing methods is also important for basing timely corrective actions, as well as regular internal audits by the companies".

#### **Continuous Improvement**

For the 2019 processing season, Campden, supported by MHKSZ, are leading a working group of participating companies to create a voluntary standard for the 'Control of *Listeria monocytogenes* in Frozen Vegetables and Fruit Products'. This joint bid brings together industry partners, and gives processors the opportunity to share experiences of both failures and successful practices within their sites, to continually improve conformity and reduce the risk for future outbreaks ■

Neogen offers a comprehensive solution for environmental monitoring in food processing sites, why not contact us to find out more?

# Environmental Monitoring for *Listeria*

Changing regulations and industry opinions on the testing of food production environments for *Listeria*, and the evolving testing technology now available to rapidly detect *Listeria*, have left many food safety professionals unclear on how, where and when to test, and what testing technology to use.

## Why *Listeria*?

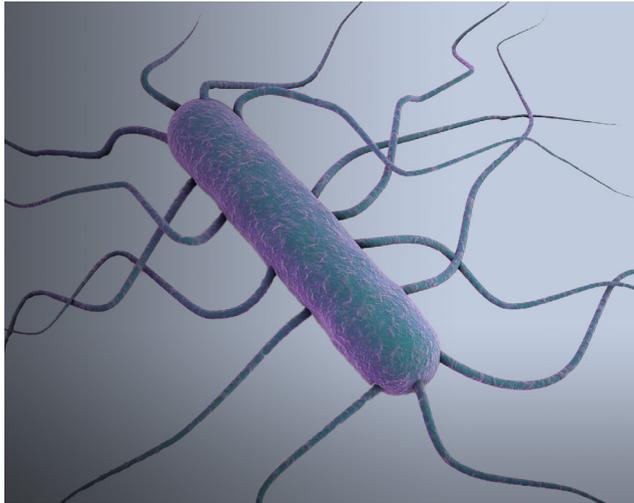
Due to its widespread prevalence and the bacteria's high survival rates under adverse conditions, a special focus on the identification and eradication of *Listeria* in the processing environment has developed over the past 10 years.

*Listeria* is a pervasive organism and contamination can occur at any stage of the production process where the product is in contact with the environment.

The reason environmental testing programmes often target *Listeria* species (spp.) instead of *Listeria monocytogenes* (*L. mono*) is that testing for *Listeria* spp. is viewed as an appropriate surrogate for *L. mono*. *Listeria* spp. is an indicator that pathogenic strains can grow. Eradicating *Listeria* spp. in the environment is considered sufficient to eradicating *L. mono*.

## Where To Test

A well-designed environmental monitoring programme (EMP) should include collecting and testing environmental samples from food contact and non-food contact surfaces with the intention of identifying potential sources



of contamination while taking appropriate corrective actions if the test results indicate the presence of *Listeria* spp.

- Production should be held if positives are persistent
- Conduct a comprehensive investigation

## How To Deal with Positives

If *Listeria* spp. is found during routine sampling:

- Before the next production cycle, clean and sanitise the area where the positive was found
- Retest before starting production
- Return to routine testing if follow-up (retest) samples are negative

If follow-up testing results in a second positive:

- Conduct a deep clean and sanitise
- Conduct intensified sampling and testing



## Cutting Production Down Time

The *Listeria* Right Now system can greatly enhance environmental monitoring by significantly reducing the time it takes to implement corrective actions following a positive result. A test, clean and then retest cycle can

take 48 to 72 hours with conventional testing methods. By implementing the *Listeria* Right Now system, a site could reduce the cycle time to a single day.

Many facilities are concerned about bringing *Listeria* testing in-house due to the potential for contamination. Since the *Listeria* Right Now system does not require an enrichment step, pathogens will not be growing in the facility. Further, after sampling, the swab is dipped into a lysis buffer and a heat step is carried out, this effectively destroys any pathogens in the sample reducing the risk of cross contamination ■

## Common Sources of Microbial Contamination in a Food Plant:

**The Environment** – soil from the production environment and/or the surrounding environment contain microbes. Cross-contact can cause contamination.

**Employees and Visitors** – can shed pathogens through unprotected contact with food and food production surfaces.

# Other Monitoring Tools

## Tools for a Comprehensive Environmental Monitoring Plan

Neogen offers a suite of complementary products to be used alongside *Listeria* Right Now to reduce cross contamination within a production environment

### Allergens



Reveal® 3-D tests are uniquely designed with three lines of detection and can be used to screen for the presence of low levels of allergens in rinses and on environmental swabs virtually anywhere providing results in 10 minutes or less.

We also offer our unique Reveal for Multi-Treenut lateral flow to detect six tree nuts with one test.

Neogen offers tests for:

- Almond
- Egg
- Hazelnut
- Peanut
- Soy
- Tree Nuts
- Crustacea
- Gluten/Gliadin
- Mustard
- Sesame
- Total Milk

### Hygiene

The AccuPoint® Advanced ATP Monitoring System validates the effectiveness of your hygiene

programme by detecting food residues and microorganisms present on surfaces and in liquids by measuring the amount of adenosine triphosphate (ATP) present.

AccuPoint Advanced is the first hygiene monitoring system that has been rigorously tested and validated by AOAC as an AOAC Performance™ Tested Method.

Our three colour-coded samplers with liquid-stable chemistry are unrivalled in recovery of ATP from surfaces and rinse waters. Unlike traditional swabs, our samplers cover a larger surface area to recover ATP more consistently ■

Contact us to find out more about our environmental monitoring tools today

**Food Production Equipment and Utensils** – can contaminate present or future production if not cleaned and sanitised properly.

**Ventilation** – through air and dust circulation as well as condensation drips onto food or food contact surfaces.

**Incoming Raw Materials/Ingredients** – can contain pathogens. Risk is increased if additional ingredients are added after a kill step in the production process, as with the addition of spices to fully cooked sausage.

# Listeria Right Now: A Compact and Quick Outbreak Response Tool

**In a food processing environment, being able to quickly identify the source of pathogen contamination is crucial. It allows the area to be cleaned and the issue stopped before it becomes a more serious problem. The challenge is to be able to begin or restart production without much delay and without compromising the quality and safety of the product.**

The new test system *Listeria* Right Now (LRN) is a powerful crisis management tool that can detect *Listeria* species (spp.) in environmental samples in under an hour without enrichment. It enables food safety professionals to very quickly implement corrective actions, as well as eliminating the need to grow potentially dangerous cultures in facilities for testing and store them for follow-up.

Validated by AOAC and NSF International, and winner of the 2018 Innovation Award from CFIA (Carcrefour des Fournisseurs de l'Industrie Agroalimentaire), LRN is used in conjunction with the unique ANSR® technology. This molecular technology is based on an isothermal amplified reaction performed at constant temperature. As a result, the LRN system

can detect very low levels of *Listeria* spp. in a very short time.

### Compact and Lightweight

Compact in size and lightweight, the ANSR reader comes in a case that makes it easy to store and move. The test can be run using standard laboratory equipment, including heat blocks and a vortex. Then simply connect the reader to a laptop to fully analyse results. This makes it an ideal tool in situations where *Listeria* contamination is detected and the source has to be identified quickly.

With LRN, the process is simple and easy: swab surfaces, replace the swab in its tube containing a lysis solution, and test with ANSR. From swabbing to result, the procedure takes less than an hour.

The portability and the fast time to result makes the system an ideal outbreak response tool and is particularly suited to companies spread out over various sites as well as contract service laboratories. While the primary use of LRN is to conduct investigations in near real-time after positives to enable corrective actions more quickly,

No enrichment and growth of *Listeria* cultures required



Width: 36cm    Length: 45cm  
Height: 18cm    Weight: 5.8kg

it can also be used for *Listeria* monitoring as a process control by performing regular tests.

The ANSR system also offers tests for the detection of *Salmonella*, *Listeria* and *E. coli* O157:H7 in food matrices, with an assay time of just 10-18 minutes following enrichment ■

Find out more at [foodsafety.neogen.com/uk](http://foodsafety.neogen.com/uk) or email [neogen\\_emea@neogeneurope.com](mailto:neogen_emea@neogeneurope.com)

# Microbiology at the Speed of Light

**With Soleris™ you can save days in your detection of spoilage and indicator organisms**

Faster and with higher sensitivity than traditional plate counts: simplify and speed up your workflow with automated processes using Soleris, which can give you reliable results in hours, as opposed to days.

Soleris' patented, ready-to-use vials for a wide array of target organisms make this rapid automated optical system the perfect partner for microbiological testing in the food and beverage industry.

**Why not contact us today to find out more?**



# Validation Study: Methods for the Detection of *Alicyclobacillus* spp. in Fruit Juice

**A recent validation study was carried out by Neogen to evaluate the performance of the IFU (International Fruit and Vegetable Juice Association) No. 12 standard for the detection and enumeration of *Alicyclobacillus* spp. according to ISO 17468. At the same time, a comparison study with an alternative method was carried out in accordance to ISO 16140-2. The Soleris ACB-109 method/vial was chosen as the alternative method.**

**The study found Soleris could reduce time to result to just 4 days without compromising on sensitivity**

*Alicyclobacillus* spp. play a significant role in the bacterial spoilage of fruit juices. Certain *Alicyclobacillus* spp. produce guaiacol, a natural compound which causes fruit juice to develop a

disinfectant-like odour and/or taste, much to the displeasure of consumers. For this reason, testing for these bacteria is a common procedure in the fruit juice industry, and reliable and quick methods to do so are required.

The study was conducted in two parts, a method comparison study between the reference (IFU 12) and alternative (Soleris ACB-109) methods, as well as an inter-laboratory study. As the enrichment procedure was the same for both methods, the study scheme corresponds to a paired study design.

## Method Comparison Study

The method comparison study focused on the IFU 12 standard: Method for the Detection and Enumeration of Sporeforming Thermo-Acidophilic Spoilage bacteria (*Alicyclobacillus*), and the Soleris ACB-109 vials. It encompassed the following studies:

**Inclusivity Study:** All 33 target strains were detected by both methods.

**Exclusivity Study:** During the exclusivity study without a previous heat shock, the reference method gave cross reactions on 19 strains out of 30 and Soleris ACB-109 vials gave cross reactions on 13 strains out of 30. After heat shock none of the non-targeted organism were detected by either method.

**Relative Limit of Detection (RLOD) Study:** Satisfactory results for both methods and for both enrichment times (24 and 48 hours) were observed. All

RLODs were below the acceptable level fixed at 1.5 for a paired data study.

**Sensitivity Study:** No positive or negative deviations were observed; both methods showed a full negative and positive agreement.



## Inter-Laboratory Study

The inter-laboratory study was carried out by 12 laboratories across Europe, performing both qualitative and quantitative approaches. Spiked samples of UHT apple juice were provided by Neogen, and then blind-tested by the laboratories over the course of two weeks for the target strain *Alicyclobacillus acidoterrestris* ATCC 49025. Soleris was used as an alternative method for the qualitative approach. The results of the inter-lab study show that both methods tested inside the qualitative approach are reliable and comparable, as only one negative deviation was detected.

## Conclusions

After this validation study, the IFU 12 method was established as a suitable reference method in accordance to ISO 17468, and Soleris was found to be a suitable alternative method of the qualitative approach to the IFU 12 method in accordance with ISO 16140-2.

In addition, the Soleris method was found to be as sensitive as the IFU 12 method, while requiring only 4 days to offer qualitative results for the presence of *Alicyclobacillus* spp., in comparison to the required 10 days of the reference method, offering a faster alternative for qualitative testing for the fruit juice industry ■



Request your copy of the full report by contacting [neogen\\_emea@neogeneurope.com](mailto:neogen_emea@neogeneurope.com)

## Soleris in Use

**“We use the Soleris system to detect *Alicyclobacillus* in our fruit juice concentrates, which helps us reduce the time and workflow effort required in our lab.**

**“We chose the system because of its shorter analysis time, objective evaluation and user-friendly software, as well as the fact that the shortened test time has no influence on the sensitivity of the *Alicyclobacillus* analysis.**

**“In addition, the excellent cooperation with Neogen and the always helpful customer service speak for themselves.”**

Dr. Lucia Carrillo, Quality Control Microbiology, DOEHLER GmbH, Germany.



# New and Emerging Methods in Microbiology Workshop

On 30<sup>th</sup> October 2018, we were proud to welcome delegates to Neogen's first German Microbiology Workshop at the Haus der Wissenschaft (House of Science) in Brunswick. The event brought together a mix of industry experts and keynote speakers to share knowledge and expertise across their fields.

Participants enjoyed the opportunity to learn about the newest developments in ISO 16140-2 and 16140-3, regarding validation and verification of testing methods, as well as new alternative methods for microbiological testing.

The event also covered a number of case studies, including a recent inter-laboratory validation study completed for the International Fruit and Vegetable

Juice Association (see page 10). The implementation of an alternative method, ANSR, to detect *Listeria* in the plants of the DMK, one of Germany's biggest dairy companies, was another practical example that gave participants the opportunity to learn how alternative testing methods can be used in their different industries ■

View details of our next microbiology workshop below

# UK Microbiology Workshop

2<sup>nd</sup> May 2019  
Hinxton, Cambridgeshire

Following the success of our previous industry events, this May we will be hosting our next Microbiology Workshop focusing on the latest advances, news and trends within the industry. We have put together a detailed programme suited to both food manufacturers and commercial laboratories alike, offering breakout sessions where you can learn about a range of topical issues from environmental monitoring, to innovative alternative testing methods and 16S Metagenomics. On the day you will be able to meet and share knowledge with our fantastic range of internal and external speakers ■

## Register Your Interest Today

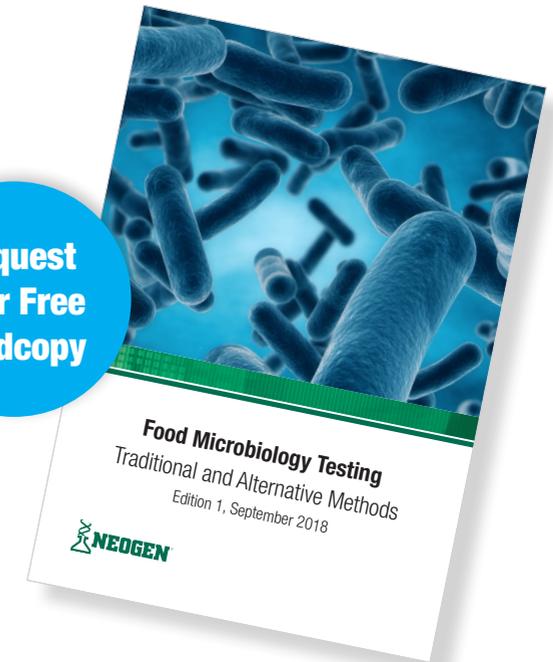
If you are interested in attending our May workshop, please email [neogen\\_emea@neogeneurope.com](mailto:neogen_emea@neogeneurope.com) for more information or to reserve your place today.



# Guide to Food Microbiology Testing

## Traditional and Alternative Methods

Request Your Free Hardcopy

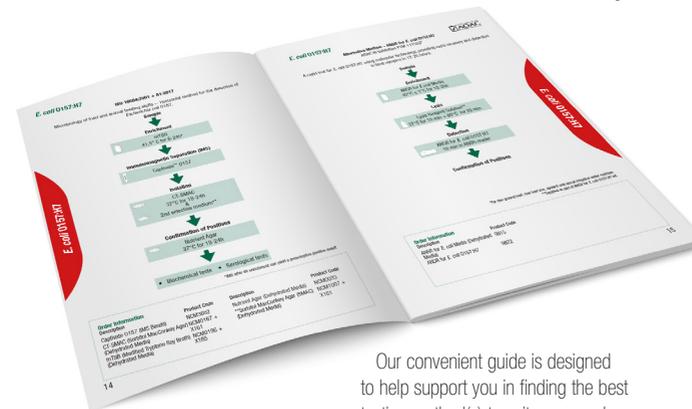


For a limited time you can request your free copy of Neogen's Guide to Food Microbiology Testing. Our convenient reference tool contains workflows for both traditional and alternative methods to detect a range of pathogens and spoilage organisms routinely tested within the food industry.

✓ Over 30 easy to read, illustrated workflows

✓ See the validations, timing and resources required for each workflow clearly

✓ Includes:  
*Listeria*  
*Salmonella*  
*E. coli* 0157:H7  
*Bacillus cereus*  
Total Viable Count  
*E. coli*  
Coliforms  
Enterobacteriaceae  
Yeasts and Moulds



Our convenient guide is designed to help support you in finding the best testing method(s) to suit your needs, as well as holding all the relevant ordering information, in one easy to use resource ■

To request your copy simply email [neogen\\_emea@neogeneurope.com](mailto:neogen_emea@neogeneurope.com) or scan here



# Microbiology Insider



For more information on any of our microbiology testing solutions we have a range of support materials available. **Simply complete the form below and return by email/fax or call for more information.**

I would like

Technical Information     A Product Demonstration     A Call Back

For

Marine Biotoxins     Allergens     Food Safety

Mycotoxins     Meat Speciation     Pathogens and Spoilage Organisms

    ATP Hygiene Monitoring     Contract Laboratory Services

Name

Job Title

Phone

Email

Company

We also offer comprehensive testing solutions for:

- ✔ Allergens
- ✔ Hygiene
- ✔ Meat Speciation
- ✔ Mycotoxins
- ✔ Marine Biotoxins
- ✔ Pathogens and Spoilage Organisms

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