Effective environmental monitoring for listeria in food processing

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 eradicate 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.

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

Cutting production downtime

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.

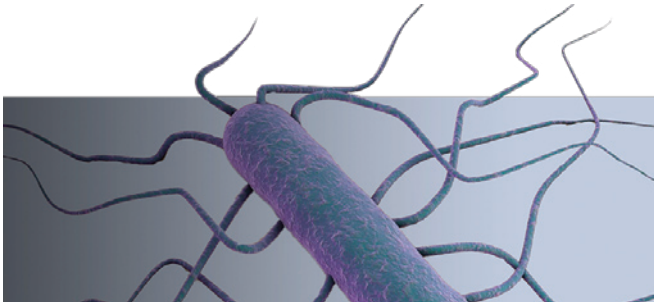
Neogen's Listeria Right Now system can greatly enhance environmental monitoring by significantly reducing the time it takes to implement corrective actions following a positive result.

A test, clean and then retest cycle can take 48-72 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.

Listeria Right Now has been validated by AOAC and NSF International, and was the winner of the 2018 Innovation Award from CFIA (Carrefour des Fournisseurs de l'Industrie Agroalimentaire).



Microbial contamination

There are many ways in which microbial contamination can occur within a food production environment. With so many possible routes of transmission, as well as the risk of cross-contamination, it is important to be aware of these potential sources and ensure processes are in place to reduce risk.

Cross-contamination is known to be a contributing factor to several well-documented outbreaks of foodborne illness, and so a comprehensive EMP is essential.

Common sources include:

- **The environment:** Soil from the production environment and/or the surrounding environment contains microbes. Cross-contact can cause and spread contamination.
- **Employees and visitors:** Can shed pathogens through unprotected contact with food and food production surfaces.
- **Incoming raw materials and ingredients:** Can contain pathogens. Risk is increased if additional ingredients are added after a kill step in the production process, for example the addition of spices to fully cooked sausage.
- **Food production equipment and utensils:** Can contaminate present or future production runs if not cleaned and sanitised properly.
- **Ventilation:** Contamination can be spread through air and dust circulation as well as condensation drips onto food or food contact surfaces.

Tools for a comprehensive monitoring plan

- **Hygiene testing:**

Alongside monitoring your environment for listeria, the addition of testing for adenosine triphosphate (ATP) is a beneficial tool to indicate whether surfaces are clean. ATP hygiene tests can be performed quickly with fast results, allowing unclean surfaces to be sanitised prior to contact with any food products.

Neogen's AccuPoint Advanced ATP Monitoring System validates the effectiveness of your hygiene programme by detecting food residues and micro-organisms present on surfaces and in liquids by measuring the amount of 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. Its three colour-coded samplers with liquid-stable chemistry are unrivalled in recovery of ATP from surfaces and rinse waters. Unlike traditional swabs, Neogen samplers cover a larger surface area to recover ATP more consistently, giving you confidence in your results.

- **Allergen testing**

For those manufacturers where allergen cross-contact is also of concern, testing for allergens as part of your Allergen Management Programme can help verify that your cleaning procedures are effective in removing allergen protein residues.

Neogen's 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. Neogen offers tests for the detection of almond, crustacea, egg, gluten/gliadin, hazelnut, mustard, peanut, sesame, soy, total milk and tree nuts. These complementary tools allow for a more comprehensive testing plan. ■