



TIP SHEET 19

ENVIRONMENTAL MONITORING

Environmental monitoring is an essential tool for strengthening and maintaining a robust food safety system. It ensures the food safety programs in place are not only verified, but also validated to ensure the programs limit or eliminate risk-based pathogens that could potentially cause harm to consumers.

LEARNING OBJECTIVES	APPLICABLE CODE ELEMENT(S)
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- UNDERSTAND THE IMPORTANCE OF THE ENVIRONMENTAL MONITORING PROGRAM
- DESCRIBE WHAT AN ENVIRONMENTAL MONITORING PROGRAM INCLUDES
- APPLY ENVIRONMENTAL MONITORING TO YOUR SITE THROUGH THE IMPLEMENTATION OF THE SQF FUNDAMENTALS PROGRAM

- 2.4.8 ENVIRONMENTAL MONITORING

KEY TERMS

- RISK BASED APPROACH

Understanding the various risks associated with a food-safety related activity, area, or program, and then taking measures based on calculated assessments to limit or eliminate those risks.

- ENVIRONMENTAL MONITORING PROGRAM (EMP)

A program which includes pathogen or indicator swabbing as appropriate to detect risk in the sanitary conditions in the processing environment. A verification of the effectiveness of the pathogen controls that a management facility has in place for high risk foods.

- INDICATOR ORGANISMS

Organisms in food and ingredients that aid in the identification of the presence of unwanted pathogens. (i.e. Total plate count (TPC), fecal coliforms, etc.)



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○ HIGH RISK FOOD

Food that allows the easy growth of bacteria; includes those that are moist and contain nutrients for microbial growth.

PROCESS STEPS

The process flow is particularly relevant for high risk processes where the product is subject to handling or exposure after a “kill-step.” This includes segregation of the post-process end from the raw material end of the process; controlling pedestrian walkways to avoid personnel contamination; dedicated tools and equipment post-process; dedicated staff servicing the post-process end; and dedicated uniforms for staff working post-process. The reference to the environmental monitoring program is self-explanatory but is worth repeating as it is considered mandatory for areas in which high risk food is processed, handled or exposed. Failure to have an effective environmental monitoring program will result in a major non-conformance.

An environmental monitoring program (EMP) is a program which includes pathogen swabbing to detect risk in the sanitary conditions of the processing environment and is a verification of the effectiveness of the pathogen controls that a management site has in place for high risk foods. Swabbing must include not only the smooth, accessible parts of the process, but also the transfer points, bearings, etc., where product is likely to build up. The main goal of your EMP is to aggressively seek out pathogens or allergens in the environment before they contaminate product. By doing this you can also assess effectiveness of cleaning, sanitation, and employee hygiene practices.

1. Determine the risks associated with the activity.

Create a task team to create, implement, and monitor the EMP.

Determine indicator organisms that are present in your ingredients and food product as well as which potential pathogens could be present at any given time.

2. Determine the appropriate methods to be used to mitigate identified risks.

An environmental monitoring program should include zone sampling. Each zone should be assessed, and the following information should be included: all activities and areas within zones, all pathogens for each zone, all associated risks from those pathogens, all mitigation techniques to limit and eliminate the pathogen growth, frequency of swabbing, testing and monitoring, corrective actions should test results be positive.



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Zone 1: direct food contact surfaces (i.e., conveyers, utensils).

Zone 2: Indirect food-contact surfaces that are close to food-contact surfaces (i.e. crevices of equipment, drip shields).

Zone 3: Indirect food-contact surfaces that are not close to food-contact surfaces (i.e. walls, floors, drains).

Zone 4: Areas distant from food-contact surfaces and processing areas (i.e. locker rooms, lunch rooms, offices).

One method to identify sampling sites is to use a facility map divided into a grid. This will allow for random rotation across the grid. Make sure you are routinely selecting samples from high-risk sites.

3. Create an environmental sampling and testing schedule.

Make sure to include:

- The frequency of sampling – weekly, monthly, annually.
 - Low risk product? Typically, performed once a year or as needed.
 - High risk product? Typically performed once a quarter or as needed.
 - Validation and Verification should be tested daily or as needed.
 - Baselines for testing should be determined based on the site's historical data. It is recommended that historical data be kept for a minimum of three months.
- The number of samples to be taken- dependent on the size of the site.
- Timing of actual sampling.
 - Before or during production.
- Detailed information of the applicable pathogens or indicator organisms
 - Based on risk assessment.
 - Based on industry experience.
- The identified and trained employee's name responsible for conducting the swabs and designated labs tasked with testing
 - If using an inside employee, he or she must have the appropriate training, certification, and credentials for carrying out their specified tasks.
 - All testing labs should be accredited to ISO17025 or an equivalent national standard.

4. Verify and validate the schedule annually or as needed.

To ensure the success of your environmental monitoring program, it is important to verify and validate the program on an on-going, daily basis.

Data should always be reviewed by a qualified/competent individual. An investigation should be conducted on all positive or suspect results. Make sure to always use these results to map trends and share them with senior management.



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You can also keep up-to-date by reviewing literature on the relevant pathogens that may affect your ingredients or finished product. Ensure that these pathogens are included in your program and are appropriately assessed.

Ensure that testing results are monitored, and corrective actions are implemented where unsatisfactory trends are observed. Should a deviation occur corrective actions that may be appropriate would include, but are not limited to: change in cleaning chemicals such as sanitizers, frequency of cleaning program, etc. Corrective action will vary based on zoning, site, product produced, etc.

RELEVANT RESOURCES

- SQFI website - Use of an SQF consultant
<https://www.sqfi.com/sqf-professional/>
- SQF Food Safety Code for Manufacturing Module 2 Guidance Document
<https://www.sqfi.com/wp-content/uploads/Module-2-Manufacturing-Guidance-with-cover.pdf>
- Accredited labs for testing include, but are not limited to:
Ecolab: <https://www.ecolab.com/>
Merieux: <https://www.merieuxnutrisciences.com/us/services/food-safety-and-quality/food-testing>
Eurofins:
https://www.eurofinsdiscoveryservices.com/?gclid=EAlalQobChMI8eHnsrXY3AIVyWSGCh3FbAleEAAYASAAEgLJS_D_BwE
FSNS: <http://fsns.com/services/microbiology-testing>
- To learn about the most common food-borne pathogens and where they are likely to occur:
<http://www.fightbac.org/food-poisoning/foodborne-pathogens/>
https://www.fsis.usda.gov/wps/wcm/connect/6632a934-01bd-4ab4-8388-709d3592871b/Slides_FSEC_JGreig_Transmission.pdf?MOD=AJPERES&CACHEID=1cfa d8c6-72c8-4c2f-b5a1-e7d080aba8a0
<https://www.omicronline.org/open-access/biofilm-formation-of-foodborne-pathogens-and-their-control-in-food-processing-facilities-.php?aid=77203>