

Beyond the Swab:

How to Build a Smarter Listeria EMP

Today's Presenter:

Steven Tsuyuki

The Acheson Group



FSMAFRIDAY

Monthly Industry News, Updates & Trends for Food, Beverage, & CPG Manufacturers



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- ✓ Monthly FSMA Related News
- ✓ Regulation Changes & Updates
- ✓ Industry Trends
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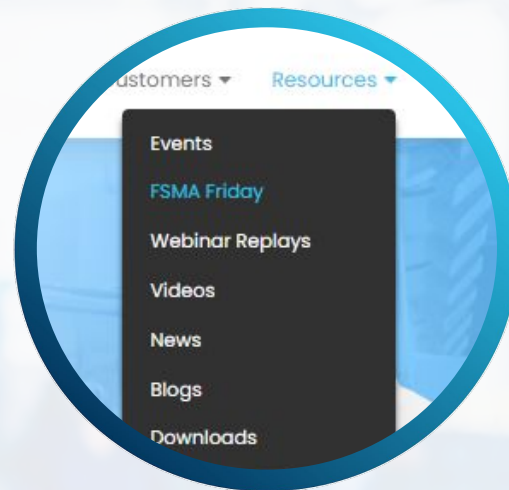


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Before we get started

- ✓ Only panelist microphones are on
- ✓ Ask questions! (Q&A at end)
- ✓ Recording link will be shared
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Meet your FSMA Friday speaker

Steven Tsuyuki

Senior Advisor, Food Safety



- Led Maple Leaf Foods' environmental monitoring program for 17 years, starting after the 2008 listeriosis event
- Retired as Senior Director, Corporate Sanitation and EMP, after standardizing sanitation across 20+ hatchery, harvest and ready-to-eat facilities
- Has presented at the Meat Institute Advanced Listeria Control workshop since 2009
- Held senior roles in sanitation, food safety, QA, operations and Six Sigma over 40+ years in meat, pet food and confectionery
- Now Senior Advisor, Food Safety at The Acheson Group

Agenda

01.

Beyond the Swab: How to Build a Smarter Listeria EMP

02.

Q&A

03.

SafetyChain Demo

Recent Regulatory Updates Overview

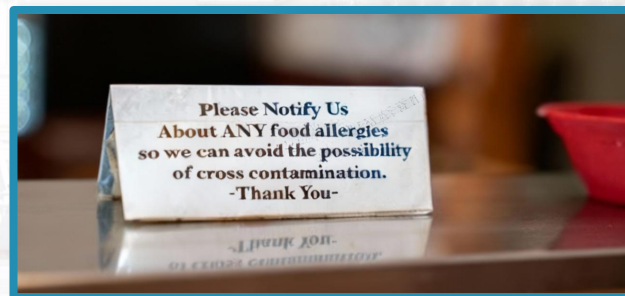
Cyclospora Mitigation Strategy

- On October 2, 2026, FDA outlined ten planned surveillance and outreach actions leading into the 2027 growing season following summer outbreaks linked to iceberg lettuce.



Enforcement Discretion for Food Traceability

- Draft notice posted by FDA on October 9, 2026, raising the intent to exercise enforcement discretion on certain food traceability record requirements for small retail food establishments and restaurants.



Beyond the Swab: How to Build a Smarter Listeria EMP

Learning objectives

- 1 Environmental Monitoring (EM) is superior to product testing since product testing cannot provide the “voice of the process” that swabbing can.
- 2 The *Listeria* Control equation is the foundation that control measures are built on.
- 3 EM is NOT a control measure. Swabbing verifies that plant *Listeria* control measures are working as intended.
- 4 Evolve swabbing plans by using a “learning mode” that adds targeted sites (chosen by people) to randomized sites (chosen by software).
- 5 A routine EM positive finding is NOT the “Seek” in Seek and Destroy. Bias first responses to investigation (true seek) to find the contamination source and associated transfer vectors. Remediation (destroy) ensures implemented corrective actions will be both effective and sustainable.

How would you describe your Listeria EMP right now?

- A We have a randomized swabbing plan in place
- B We've built our swab site list around our specific control factors
- C We're still working on it
- D Honestly, I'd have to check

Meat Institute's free *Listeria* control course

Foundations of *Listeria* Control

Created by the Meat Institute. The basic course is interactive, self-paced and free to EVERYONE!

How to find it

Go to the website:

meatinstitute.org/foundations-of-listeria

Click the Resource tab and select Foundations of Listeria for the course.

FDA guidance favors EM over product testing

FDA: “**A well-designed environmental monitoring program** promotes knowledge and awareness of the environmental conditions that could result in product contamination and **is a more effective program than product testing alone.**”

In addition, “CFR 117 requires, as appropriate to the facility, the food, and the nature of the preventive control and its role in the facility’s food safety system, environmental monitoring for *L. monocytogenes* or for an appropriate indicator organism (e.g., *Listeria* spp.)”

Source: 2017 FDA, Control of *Listeria monocytogenes* in Ready-To-Eat Foods: Guidance for Industry, draft guidance, p. 33

Why is EM superior to product testing?

Probability of missing sporadic contamination by product sampling. Columns show % contamination in the lot.

Samples	10%	2%	1%	0.5%
3	73%	94%	97%	99%
10	35%	82%	90%	95%
60	<0.5%	30%	55%	74%
120	<0.5%	8.9%	30%	55%
180	<0.5%	2.6%	16%	41%
240	<0.5%	0.8%	9%	30%

Calculated as $(1 - p)^n$, where p is the % contamination.

Listeria contamination in product is rarely normally distributed. To prove the lot is NOT adulterated, to be 100% certain, the entire lot would have to be tested.

Only highly contaminated lots can be identified through product testing. A product positive provides no information for root cause analysis.

BUT, environmental monitoring provides the “voice of the process” to ensure that food contact surfaces and ultimately product is “protected”.

Voice of the process is the metadata associated with each swab taken.

The foundation of *Listeria* control



Listeria Control equation was developed by the original AMI presentation team for inclusion in the Advanced *Listeria* Control workshop.

The equation is the foundation for the development of plant *Listeria* control measures.

EM swabbing is **NOT** a control measure. It is a monitoring activity that verifies that control measures are working as intended.

The equation and the prerequisite programs

Controlled traffic
patterns

GMPs

GMPs: Employee hygiene, traffic flow patterns, and general product handling practices

Effective sanitation practices

SSOPs: Daily, non-daily cleaning tasks, and housekeeping tasks during production. Tasks must be validated and documented in detail for training and verification.

Clean dry uncracked
floors, walls and
ceiling

Sanitary design
equipment and
building

Production control: Hazard controls for microbes, allergens and foreign material.

Building step 1: identify control measures

Control factors (Xs)



*Envelope includes floors, walls and ceiling in exposed RTE product areas

Building step 1: control measures by factor

Controlled traffic patterns

- Separate high care areas

GMPs

- Protect product
- Housekeep during production

Envelope* conditions that eliminate *Listeria* spreading

- Stop spreading through incidental water contact

Effective sanitation procedures

- Clean and sanitize to eliminate equipment harborage

Envelope* conditions that eliminate *Listeria* shedding

- Stop shedding from infrastructure contamination

Sanitary design equipment and building

- Purchase or modify equipment to reduce cleaning burden
- Maintain equipment “wear and tear” to prevent water ingress
- Guard equipment that allows access for cleaning

*Envelope includes floors, walls and ceiling in exposed RTE product areas

Environmental control takes an “entire village”

Control factor	Plant owner
Controlled traffic patterns	Operations
GMPs	Operations
Clean dry uncracked floors	Operations, Maintenance
Effective sanitation procedures	Sanitation
Sanitary design equipment and building	Maintenance, H&S, Engineering, Purchasing

Operations, Sanitation, Maintenance, and FSQA must have ownership and accountability at the plant level while corporate stakeholders in H&S, Engineering and Purchasing support food safety and product quality.

FDA EMP guidance: zone definitions

Zone	Sampling areas
Zone 1	Food-contact surfaces. Examples: utensils, table surfaces, slicers, pipe interiors, tank interiors, filler bowls, packaging and conveyors, hoppers.
Zone 2	Non-food-contact surfaces in close proximity to food and food contact surfaces. Examples: equipment housing or framework, and some walls, floors or drains in the immediate vicinity of FCSs carts.
Zone 3	More remote non-food-contact surfaces in or near the processing areas that could lead to contamination of Zones 1 and 2. Examples: forklifts, hand trucks and carts that move within the plant and some walls, floors or drains not in the immediate vicinity of FCSs.
Zone 4	Non-food-contact surfaces, remote areas outside of the processing area, from which environmental pathogens can be introduced into the processing environment. Examples: locker rooms, cafeterias, and hallways outside the production area or outside areas where raw materials or finished foods are stored or transported.

Building step 2: define the swabbing scope

Primary areas

From post-lethality exposed RTE product to primary packaging.

Secondary areas

Immediate adjacent areas where traffic and water moves into the primary area.
Maintenance shop, FSQA area.

Tertiary areas

Welfare areas, trash dock, facility perimeter entry points.

The RAW area is **NOT** in scope (if applicable and separated).

Building step 3: develop a targeted swab site list

LC factor	Control measure	Examples of control measures and (targeted swab sites)
Controlled traffic patterns	Separation	Entry hurdles. (Immediately after execution) Product rack and bin wheels. (Wheel/lower framework and “grab” handles)
GMPs	Protection	Sanitizing protocols for front line employees. (Gloved hands) Sanitizing protocols for transient tools. (Tools entering RTE)
Clean dry uncracked floors	Stop spreading and shedding	Dry floors/walls. (“Squishy floors” or weeping water/condensation) All water “streams” directed to drains. (Swab every finding) Intact roof and ceiling. (Tarp locations)

Building step 3: targeted sites (continued)

LC factor	Control measure	Examples of control measures and (targeted swab sites)
Effective sanitation practices	Cleaned and sanitized (microbe level)	Focus on equipment that is complex or a burden to clean. (Rinsate samples are taken during the sanitation process AFTER the final rinse step but BEFORE the final sanitization step) Operational housekeeping. (Focus on surfaces where product accumulates). Note: APC swabbing is recommended.
Sanitary design equipment and building	Eliminate sanitation burden	Periodic cleaning tasks. (Bias swabbing on “hard to clean” equipment before and after non-daily tasks to verify task effectiveness AND that task frequency is preventive) Swab maintenance tools AFTER invasive work.

Building step 4: review random swabbing

Randomized sites

Sites are randomly selected by software so that all FCS sites have an equal probability of being sampled, within a timeframe specified in the plant program. (Example: yearly)

Randomized days

Swabbing days are randomized. Includes ALL days within a production week.

Randomized times

Swabbing times are randomized. Includes the ENTIRE production window from T3 to the last hour of production.

Swabbing plans: how often are Z1 sites tested?

Building step 5: add discretionary swabbing

Sites are selected by people.

Adopt a “learning mode” (*Listeria* Battleship) to select discretionary sites that increase the probability of finding the pathogen, if present in the plant environment. Start by replacing one random site with a discretionary site and evolve to a 50/50 split.

Discretionary swab sites include:

- Historical positive sites
- Sites to verify control measure efficacy
- Areas where the infrastructure or operational conditions are challenging
- Areas/equipment where sanitation issues persist
- Ad hoc swabs based on “real time” observations (swabber’s choice)

The *Listeria* Battleship method

Treat discretionary swabbing as a targeted hunt: choose sites where *Listeria* is most likely to hide.

Quick poll 2 of 4

Do you use any discretionary (people-chosen) sites alongside your randomized sites?

- A Yes, we mix randomized and targeted sites
- B No, everything is randomized
- C Our program doesn't use software randomization yet
- D I'm not sure how ours is structured

Bias the first response to investigation

When a routine EM positive is treated as the “seek,” Seek & Destroy becomes “Whac-a-Mole”.

Seek: Find it (contamination source and associated transfer vectors).

Destroy: Fix it (corrective actions that are effective and sustainable).

Remediation without investigation = Whac-a-Mole

Fix it without finding the source and it comes back somewhere else, sooner than you expect. Bias your first response to investigation. Destroy only once you’ve found what you’re actually destroying.

Seek starts with observations

Upon receipt of the positive finding, organize a team to observe the affected line and equipment.

Is the flow of product, people and equipment in the areas that post-lethality exposed product is handled acceptable? Any non-routine activities?

Are GMPs being followed when handling post-lethality exposed product? Product accumulation on equipment?

Are the floors dry and in good condition?

Concerns over recent sanitation performance?

Observed “wear and tear” on equipment and infrastructure that may be contributing factors?

Seek continues with questions and data

Talk to the front-line operators and sanitors

Talk to the front-line operators and sanitors for the affected line to understand the current state and gain input on what they think is happening to create risk.

Compile data

Production records, GMP audits, sanitation performance, maintenance records, etc.

Quick poll 3 of 4

When your plant gets a positive Listeria finding, what's the first move?

- A Remediation: clean harder, get a clear swab
- B Investigation first: find the source before cleaning
- C It depends on the zone and location
- D We don't have a defined response playbook

Final thoughts

Rebuild the EMP by connecting swabbing with the *Listeria* control equation and follow the steps described in this presentation:

1

Identify the control measures in place for each relevant control factor.

2

Define the EM swabbing scope.

3

Develop a “targeted” list of swab sites that will verify that the control measures are working as intended.

4

Verify that random EM swabbing is truly random in all aspects.

5

Introduce discretionary swabs by replacing random sites.

6

When a positive finding occurs, bias first response to investigation, NOT remediation.

Listeria control is a journey and Environmental Monitoring (EM) can facilitate continuous improvement when positive findings reveal contamination sources and associated transfer vectors that result in effective and sustainable corrective actions.

Quick poll 4 of 4

After today, what's the first thing you'd look at in your EMP?

- A Map our swab sites against our actual control factors and find the gaps
- B Check whether our randomization is truly random, or just rotating the same sites
- C Write down what we'd actually do if we got a positive tomorrow
- D Start the conversation with sanitation and ops about who owns what

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Questions? 



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DR. BEN MILLER

COO & EVP OF REGULATORY &
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