



# WELCOME!

## Is *Listeria* under Control in Your Sprout or Microgreen Operation?





## AGENDA

- 1. Recalls Associated with *Listeria* on Sprouts/Microgreens, *Carmen Wakeling, President, ISGA***
- 2. Environmental Monitoring for *Listeria* at a Sprout or Microgreen Operation, *Kaiping Deng, Co-Lead and Coordinator, SSA***
- 3. Q and A, *All***





## NEED TO KNOW

- **This webinar is recorded. The presentation will be available on the SSA website.**
- **All the participant lines are on mute.**





## NEED TO KNOW

### Q&A session

The Q&A will begin at ~ **11:50 AM PST**. You may type your questions or comments in the Q&A box on your screen prior to **11:50 AM**.





## Objectives of this webinar

- Share *Listeria* concerns associated with sprouts and microgreens from industry perspective
- Provide an overview of *Listeria* hazards
- Describe how to develop an environmental monitoring program
- Answer questions that might help participants better understand and address environmental monitoring needs



**Listeria webinar: Hosted by Institute for Food Safety and Health (IFSH)  
On behalf of Sprouts and microgreens Canada and International Sprout  
Growers Association**

**WEBINAR SEPTEMBER 30, 201**



**ISGA**

*International  
Sprout Growers  
Association*

## **THE MISSION OF THE ISGA**

*“Our mission is to promote the health benefits of sprouts and encourage a global collaboration among sprout growers and suppliers. We strive to work with researchers and government agencies to assure the safe production of all sprouted foods.”*

# Mark your calendars!

- ▶ 2020 will find us landing in Miami Florida, April 20-24



**The VISION is to GROW,  
and the SKY is the Limit**

**MIAMI**

**International Sprout Growers Association**

**APRIL 20-24, 2020**  
**30<sup>th</sup> ANNUAL CONVENTION**



Let's look at some data...



# Statistics... Evaluation of recalls 2017-2019 Canada

## ➤ Fresh sprouts:



2019-05-13	Notification - Kind Organics brand Alfalfa recalled due to generic E. coli	Class 2	Ontario
2019-05-10	Notification - Kind Organics brand Crunchy Bean Mix recalled due to generic E. coli	Class 2	Ontario
2019-04-27	Notification - Kind Organics brand Alfalfa recalled due to generic E. coli	Class 2	Ontario
2019-04-16	Notification - Kind Organics brand Alfalfa and Broccoli Brassica recalled due to generic E. coli	Class 2	Ontario
2019-04-10	Notification - Kind Organics brand Alfalfa recalled due to generic E. coli	Class 2	Ontario

# Statistics...evaluation of recalls 2017-2019 Canada

## ► Fresh microgreens:

2019-05-22	Food Recall Warning - Pousses et Cie brand Mix Spicy Microgreens recalled due to <i>Listeria monocytogenes</i>	Class 1	Quebec
2019-04-19	Food Recall Warning - GPM brand Pea Shoots recalled due to <i>Listeria monocytogenes</i>	Class 1	Alberta, British Columbia, Saskatchewan
2018-08-25	Food Recall Warning - Certain Greenbelt Microgreens brand microgreens recalled due to <i>Listeria monocytogenes</i>	Class 1	Ontario
2018-06-29	Notification - Lufa Farms Inc. brand Arugula Microgreens recalled due to <i>Salmonella</i>	Class 2	Quebec
2018-06-28	Food Recall Warning - Goodleaf brand Daikon Radish microgreens recalled due to <i>Listeria monocytogenes</i>	Class 1	New Brunswick, Nova Scotia, Prince Edward Island
2018-06-07	Food Recall Warning - GPM brand Pea Shoots recalled due to <i>Listeria monocytogenes</i>	Class 1	Alberta, British Columbia
2018-06-07	Updated Food Recall Warning - Evergreen Herbs brand Pea Shoots recalled due to <i>Listeria monocytogenes</i>	Class 1	British Columbia, Possibly National
2018-04-30	Correction - Food Recall Warning - Certain Greenbelt Microgreens brand microgreens recalled due to <i>Listeria monocytogenes</i>	Class 1	Alberta, British Columbia
2018-04-24	Food Recall Warning - Certain Greenbelt Microgreens brand microgreens recalled due to <i>Listeria monocytogenes</i>	Class 1	Alberta, British Columbia

# Statistics... Evaluation of recalls 2017-2019 Canada & USA

## ➤ *SPROUTING*



06/21/2018	Now Real Food	Zesty Sprouting Mix	Food & Beverages, Food & Beverage Safety, Produce	Potential Salmonella contamination	Now Health Group, Inc.
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# Statistics... Evaluation of recalls USA 2017- 2019

## ► Fresh sprouts.....

03/08/2019	Fullei Fresh	Organic Bean Sprouts	Food & Beverages, Produce	Potential to be contaminated with <i>Listeria monocytogenes</i>	Fullei Fresh
06/08/2017	Goodseed	Soybean sprouts	Food & Beverages, Food & Beverage Safety, Grain/Grain Product	<i>Listeria</i>	Happy Sprout Inc



# Statistics... Evaluation of recalls USA 2017- 2019

## ► Fresh Microgreens

04/25/2018	Greenbelt Microgreens	Microgreen Mix	Food & Beverages, Food & Beverage Safety	Potential to be contaminated with Listeria monocytogenes	Greenbelt Greenhouse LTD
04/29/2019	ChloroFields	Micro-Greens Asian Mix	Food & Beverages, Produce, Vegetable Products	Potential Contamination by Salmonella	ChloroFields





# Other countries 2018-19

- **Pams, Fresh Harvest and Sproutman brand Sprout Products**
- 29 March 2019: GSF Fresh New Zealand Ltd is recalling specific dates of its Pams brand, Sproutman brand and Fresh Harvest brand Sprout products due to a production process concern. Salmonella



# INFORMATION:

## Canadian recall classes

- Based on Health Canada's HRA, the **CFIA** determines the most appropriate action, including whether or not to **recall** product. If a **recall** is necessary, the **CFIA** decides what **class** to assign to the **recall**:
- **Class I** (high risk)
- **Class II** (moderate risk)
- **Class III** (low and no risk)






# Insights from Canada: 2017-19

- ▶ One sprout company involved in a series of recall statements. This was a Class 2 recall.
- ▶ Nine recalls were initiated for microgreens. Six companies were implicated. All but one were Class 1 recalls. At least one of the microgreen companies have gone out of business.
- ▶ One recall for sprouting seed. It was a class 1 recall. This impacted Canada and the USA



# Insights from USA: 2017-19

- Fresh sprouts: two recalls (soy and mung)
  - Microgreens: two recalls. One was the same company associated with two recalls in Canada.
- 



# Microgreen Producers

As we can see from recall information earlier, the microgreen producers are really struggling.

As this seems to be more impactful to Canadian producers, we have been working with those in the industry to initiate dialog with regulators and producers to work on developing a code of practice for microgreen producers. Some of you in this room have been on those calls.

We are grateful to IFSH to be hosting a webinar for sprout and microgreen producers on September 30, 2019 to help evolve the understanding of environmental testing and risk. Feel free to join!

# Possible issues for microgreen producers

- Incoming soil mix and ingredients
- Lack of knowledge about food safety programs
- Many new producers without history
- A thing that people do in the shoulder season on small farms all over the country. These folks don't have the resources to know how to handle high risk foods





What we  
learned from  
Canadian  
microgreen  
growers



They want to improve

They need support

A simple guide to starting a  
microgreen business would be helpful

A code of practice is desperately  
wanted

Any tools that we can share are  
going to have a large impact



Thank you for your  
time today!

Let's work together to make things  
better and learn from each other!

# **Environmental Monitoring for *Listeria* at a Sprout or Microgreen Operation**

*Kaiping Deng, Ph.D*

*9-30-2019*

# *L. monocytogenes* Concerns

- Involved in outbreaks and recalls
- Naturally soil borne, thus easily introduced into an operation
- Able to grow at low temperature
- Once established in a production environment, can persist



# Types of Biological Contaminants

## Transient Microorganisms

- Introduced via raw materials, personnel, packaging materials
- Removed through normal cleaning and sanitizing
- Typically do not become established in the production environment

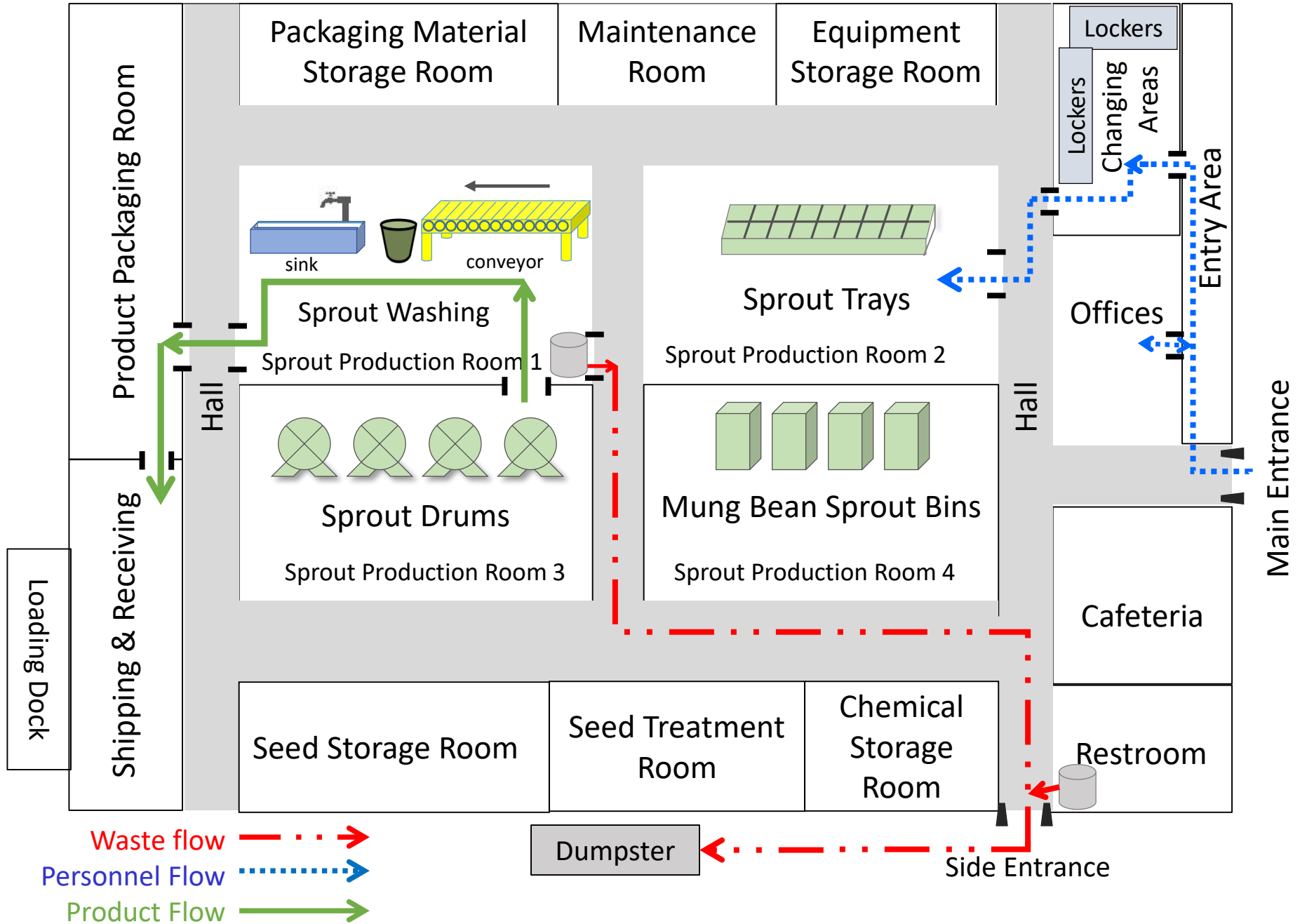
## Resident Microorganisms

- Become established in the production environment
- May persist for long periods
- Normal cleaning and sanitizing may control numbers but may not eliminate

# § Environmental Monitoring Plan Required Elements

- A sampling plan that specifies:
  - What to test for (*Listeria* spp.)
  - When to collect samples
  - Number of samples
  - Frequency of sampling
  - Sampling locations (food contact and non-food contact surfaces)
- Test methods
- Corrective action plan that describes:
  - Actions to be taken in response to positive results
  - When and how these actions will be accomplished
- Required records

# Traffic Flow



# Sampling Preparation

- Training in aseptic technique
- Sampling supplies preparation, including:
  - Sampling kit
    - Sterile sample bags, sterile sponges or swabs and neutralizing buffer
  - Disposable gloves
  - Coolers with ice packs
  - Cleaned working surface

# When to Sample

- § Samples must be collected during production
- Samples should not be collected after cleaning
  - Vary the day of week and the time of day for sampling

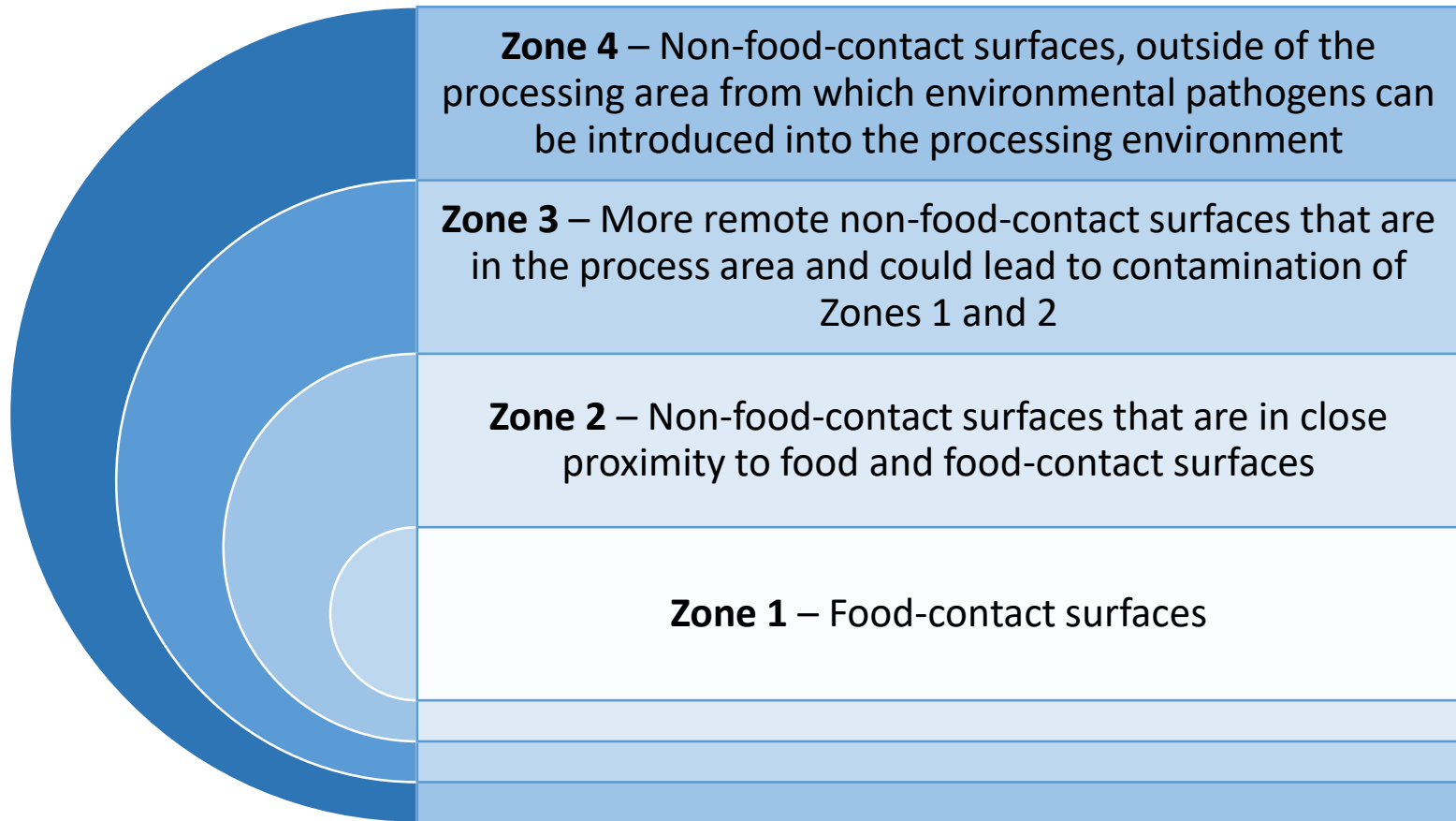
# Selection of Sampling Location

§ Sample collection sites must be specified in the written sampling plan

§ Must include both food-contact and non-food-contact surfaces

- Selection of sampling locations should be carefully planned
- Zone concept is commonly used

# Sampling Zones



**Sample Zones 2, 3 and 4 to prevent contamination in Zone 1**

# Possible Sampling Location Examples

Sample Location	Zone				Notes
	1	2	3	4	
Drum - Interior	X				
Floors		X	X		
Employee break room				X	
Equipment	X	X	X	X	Especially areas that are difficult to reach & clean; nooks & crannies; areas inside hollow equipment legs; metal joints; & cracked equipment
<i>Other examples are in the manual</i>					



# Zone 1 Location Photos



*Photos provided by a sprout grower*

# Zone 2 Photo



Source:  
Sprout grower

*Photos provided by a sprout grower*

# How Many Samples to Collect

§ The number of sampling sites must be sufficient to determine whether measures are effective

- Sample number should be proportionate to risk
  - More samples from Zone 1 and Zone 2
  - Fewer from Zone 3
  - Very few or none from Zone 4 and dry areas
- Rotating sites periodically
- Food Safety Manager should review and approve site designation and numbers

# Sampling Frequency

§ Minimum acceptable frequency – monthly from FCS and non-FCS

- For operations showing control of *Listeria* over time
- More frequent
  - When an operation is just starting sampling
  - When multiple *Listeria* positives are found
  - When *Listeria* is found on any FCS
- Resume regular sampling frequency only when test results are consistently negative

# Sampling Procedure

- Label each sample bag
- Put on a new pair of gloves
- Follow kit instructions
- Remove a sampling sponge or swab from the sampling bag and swab a pre-determined area
  - Look for “worst case” areas
- Return sponge or swab to the original sample bag and seal the bag
- Place samples in the cooler with ice packs and submit for testing within 24 h
- Keep samples refrigerated at all times

# Criteria of a Reliable Testing Lab

- Laboratory qualified for *Listeria* testing
- Trained and experienced staff
- § FDA standard, or equivalent, testing methods

# Environmental Monitoring Plan Example

## A7.4 ENVIRONMENTAL MONITORING FOR *LISTERIA* SPP. - EXAMPLE

Examples are offered to facilitate creating a company specific Sampling Plan. The *Produce Safety Rule* does not require any specific format. Examples should be edited to develop an operation specific Plan.

<b>SOP# WXY</b>	<b>Environmental Monitoring for <i>Listeria</i> spp.</b>	Page 1 of 5
<b>OPERATION NAME:</b> XXX Sprout Company		<b>ISSUE DATE:</b> 03/22/2017
<b>ADDRESS:</b> 123 Sprouter Road, Yourtown, USA		<b>SUPERSEDES:</b> 02/17/2017

### Objectives

- Testing for presence of *Listeria* spp. within the production environment
- Tracking the monitoring data to identify trend of *Listeria* contamination in the production environment if the microorganism is found
- Taking appropriate corrective actions in response to positive sample findings to eliminate *Listeria* from its harborage sites
- Meeting regulatory requirements (§112.145 and §112.150(b)(2))

### Responsible Person

- Safety manager or trained Food Safety Team responsible for supervising, conducting or verifying sampling and testing procedures, associated documents, and training new operators

# Environmental Monitoring Plan Example (cont.)

## Materials Needed

- Sampling kit (including labeled sterile sample bags; sterile sponges or swabs; and neutralizing broth)
- Disposable gloves
- Cooler with ice packs
- Clean working surface
- Blank sample submission forms

## Sampling Time

- Must perform environmental sampling *during* production (e.g. 3-4 hours into production)
- During routine sampling, DO NOT perform environmental sampling after the environment has been cleaned and sanitized.

## Sampling Procedure

Follow aseptic techniques for collecting environmental monitoring samples:

- Wear clean clothing, new gloves and a hair net so as to not contaminate the samples.
- Wash hands immediately before sampling and prior to putting on new gloves.
- Keep hands away from mouth, nose, eyes and face while collecting samples. Try not to cough or sneeze into the samples.
- Protect sampling instruments from contamination before and during use.
- Open the sterile sample container (e.g. a sterile Whirl-Pak bag) only immediately before collecting a sample, and close and seal immediately after collecting the sample.



# Environmental Monitoring Plan Example (cont.)

## Sampling Protocols

A sampling kit recommended by a qualified testing lab should be used. Manufacturer's instructions of the sampling kit should be followed. The following is an example protocol.

### *Environmental Sampling Using a Prehydrated Swab (EXAMPLE)*

Swabs are pre-hydrated with a D/E neutralizing broth. These swabs should be used for sampling of small areas that cannot be accessed any other way. Examples include a hole in the floor, cracks or insides of tubular equipment mounts.

- a) Loosen cap of swab tube and remove the swab. Do not touch any portion of the swab except the cap.
- b) Collect an environmental sample by using even, firm pressure to glide the swab 10 times vertically, 10 times horizontally and 10 times diagonally over the designated sample area.
- c) Each time you change the swabbing direction, re-insert the tip of the swab into the tube and broth to rehydrate. If visible soil or residue is present, vigorously rub the swab over the designated area until the soil or residue is removed.
- d) Return the swab to its tube.
- e) Close the tube tightly and place it in a labeled sample bag that identifies each specific sample collected (e.g., sampling location, sample number and date/time of sample collection). Place the samples in the cooler with ice packs to keep samples cold but not frozen.
- f) Fill out a sample submission form.
- g) Submit the samples to the laboratory ASAP, no later than 24 hours from the time of collection.

# Environmental Monitoring Plan Example (cont.)

## Sampling Frequency

- Monthly - the maximum acceptable time between sampling and should be used only for operations with a robust monitoring program showing control of *Listeria* over time.
- More frequently - When starting an operation and trying to establish an environmental monitoring profile, until monitoring shows no *Listeria* (+) result.
- Upon finding a positive result, frequent cleaning and re-testing until eliminated.
- An example of monthly sampling site rotation schedule is listed below.

Date	Sample Group
Date 1	A
Date 2	B
Date 3	C
Date 4	D
Date 5	E
Date 6	F
Date 7	G
Date 8	H
Date 9	I
Date 10	J
Date 11	K
Date 12	L
Etc.	Repeat sequence

# Environmental Monitoring Plan Example (cont.)

## Sampling Locations:

Sample Group	Sample #	Zone	Sampling Locations
Group A	1	1	Work table-a
	2	1	Sprout washing tub interior -a
	3	1	Growing surface -a
	4	1	Spin Dryer Interior -a
	5	2	Transportation racks -a
	6	2	Floor drain in grow room -a
Group B	1	1	Sprout conveyor belt -a
	2	1	Sprout transportation tub -a
	3	1	Irrigation sprinkler nozzles -a
	4	1	Growing surface -b
	5	2	Ceiling in growing room -a
	6	2	Floor drain in grow room -b
Group C	1	1	Work table-b
	2	1	Growing surface -c
	3	2	Sprout Conveyor frame -a
	4	1	Reusable apron on worker -a
	5	2	Sprout washing tub exterior -a
	6	2	Floor drain in grow room -c

# Environmental Monitoring Plan Example (cont.)

## Records

See Appendix 12: Recordkeeping for a corrective action record example

*Sampling and testing record sheet* (Can be used as a template.)

**XXX Sprout Company Name**

**123 Sprouter Road, Yourtown USA**

<b>Testing Laboratory Name</b>	123 Testing Company
<b>Address</b>	456 Analytical Lane, Nextown USA 23456
<b>Phone and Fax</b>	XXX-XXX-XXXX
<b>E-mail</b>	123Test@xxx.com
<b>Primary Contact Person</b>	Bugs Hunter

## Environmental Monitoring Test Form

<b>Swabbed by</b>						
<b>Date of Sampling</b>						
<b>Date of Sample Submission</b>						
Sample Number	Sampling Location		Swab Kit Used	Surface Type* (circle one)	Test for (circle one)	Test Result
	General Location	Specific Location				
A-1				FC   NFC	<i>Listeria spp.</i> <i>/L. mono.</i>	
A-2				FC   NFC	<i>Listeria spp.</i> <i>/L. mono.</i>	
A-3				FC   NFC	<i>Listeria spp.</i> <i>/L. mono.</i>	

# Key Factors for Effective Sanitation

- Commitment from ownership and management
- Coordination between production and sanitation
- Sufficient time to clean and sanitize
- Dedicate sanitation crew
- Sanitation plan
- Proper chemicals

# For More Information

## SSA website:

[http://www.iit.edu/ifsh/sprout\\_safety/](http://www.iit.edu/ifsh/sprout_safety/)

- Contact information
- SSA Training Manual available for free download at the “SSA Home” page
- Word files of sample documents at the “SSA Resources” page



## **Q and A**



**Thank you for your participation!**

The presentation will be posted on  
the SSA website.

**Get Connected with the SSA Today!**

[www.iit.edu/ifsh/sprout\\_safety](http://www.iit.edu/ifsh/sprout_safety)