



# Listeria Management Plans

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## Listeria

Neal's Yard Creamery recalls its 'Hay on Wye' unpasteurised goat's cheese due to the presence of listeria



Last updated: 7 June 2016

Neal's Yard Creamery in Dorstone, Herefordshire, is recalling its 'Hay on Wye' unpasteurised goat's cheese because high levels of listeria have been found in the product.

Product recall

**2206 cases in Eu in 2015**  
**270 deaths**  
**18% fatality rate**

Food Standards Agency  
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 Scotch Smoked Salmon Co. Ltd recalls smoked salmon products due to the possible presence of Listeria monocytogenes

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Scotch Smoked Salmon Co. Ltd recalls smoked salmon products due to the possible presence of Listeria monocytogenes

Last updated: 4 November 2016  
 Scotch Smoked Salmon Co. Ltd is recalling two of its smoked salmon products because the bacterium known as Listeria monocytogenes has been found in them. Listeria monocytogenes is a bacterium that can cause foodborne illness. This means the products should not be eaten.

Product recall

Daylesford recalls two ham products because of the presence of Listeria monocytogenes



Last updated: 6 July 2017

Daylesford is recalling Rosemary & Thyme Roast Ham and Smoked Black Ham because Listeria monocytogenes has been found in the products.

Product recall

Costco Wholesale recalls its Organic by Nature Organic Vegetable Medley due to possible listeria contamination



Last updated: 10 May 2016

Costco Wholesale has recalled its Organic by Nature Organic Vegetable Medley as a precautionary measure due to possible listeria contamination. Listeria is a food bacterium that can cause food poisoning.

Product recall

Sainsbury's recalls several of its Deli Fillers products due to the presence of Listeria



Last updated: 26 June 2017

Sainsbury's is recalling a number of their products because Listeria monocytogenes has been found in some of the products.

Product recall



## Listeria Management Plan (LMP)

A LMP is likely to have the following prerequisite components. It may be part of the HACCP plan or a Food Safety Plan, comprising of e.g. HACCP, TACCP, PEP, traceability and product recall studies.

- Listeria training
- Product design
- Raw material risk assessment (pre/post decontamination)
- Product decontamination procedure (cooking, washing etc.)
- Product storage and transport requirements
- Product shelf-life studies
- Product Listeria sampling
- Laboratory requirements for Listeria testing

## LMP continued

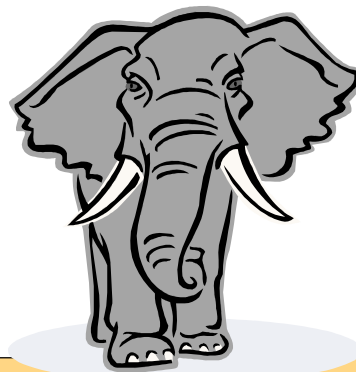
- Consideration of the processing environment

## LMP continued

- Prerequisite Validations
- Environmental sampling
- Product and environmental results analysis and trending
- Company policy and need for strain fingerprinting
- Customer Listeria reporting structures
- Internal Listeria reporting structures
- Out of spec investigations
- Product traceability and recall
- Environmental decontamination policy
- Listeria Management Plan internal audit and review

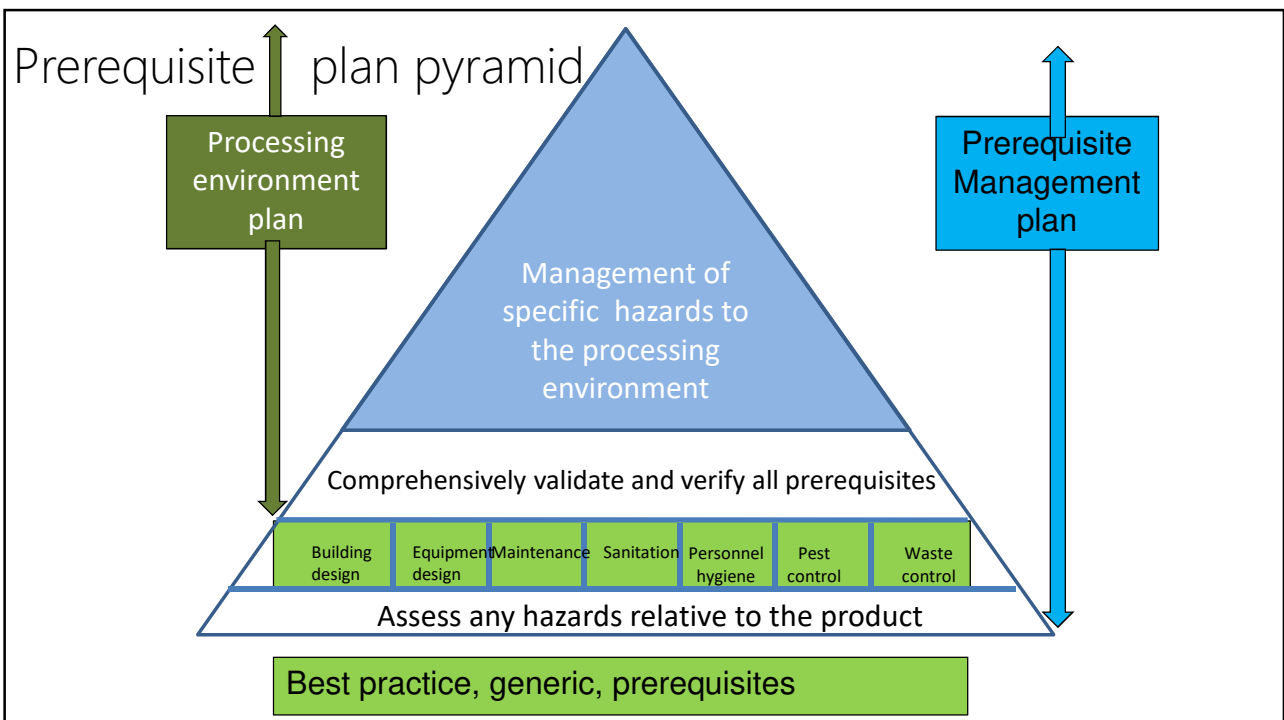
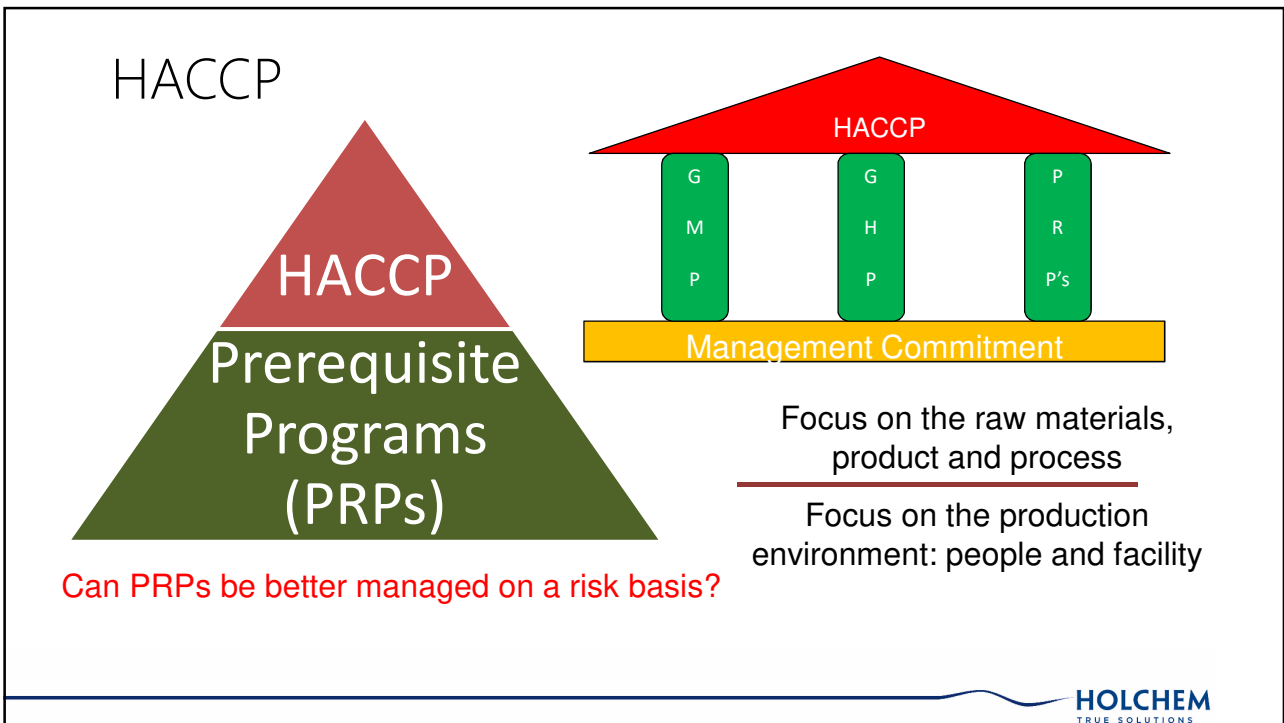
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## Consideration of the processing environment



*If HACCP works so well, then why are there still so many cases  
of food borne illness?*

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## PEP steps 1-3 (HACCP influenced)

1. Obtain management commitment
  - For RTE manufacturers, plan outputs may be significant controls
  - Select Leader to oversee the plans development and implementation
2. Define the scope of the terms of reference
  - The processing area(s)
  - The hazards to consider (Listeria)
  - The potential sources and routes (vectors) of environmental contamination transfer
3. Select the PEP team
  - Technical, engineering, microbiologist, HACCP, production, hygiene, scribe, [consultant]

## PEP steps 4-5

4. Describe the environment
  - Size, zones, boundaries, barriers, services, air flows, temperatures, humidity, people flows, transport flows, liquid and solid waste flows
  - Production periods, sanitation procedures, shut downs
  - Historical sampling and observational data
5. Identify any process controls
  - E.g. post heat treatment, when does the product become susceptible to cross-contamination

## PEP steps 6-7

### 6. Construct flow diagram

- Base layer of processing area and process lines
- Overlaying plans of e.g. people flows (operatives, QC, supervisors, maintenance, visitors etc.), product flows, transport flows, waste flows, air flows and temperatures, line interventions, historical sampling data
- Consider all times of the day, week, month, production, weekend, shut down etc.

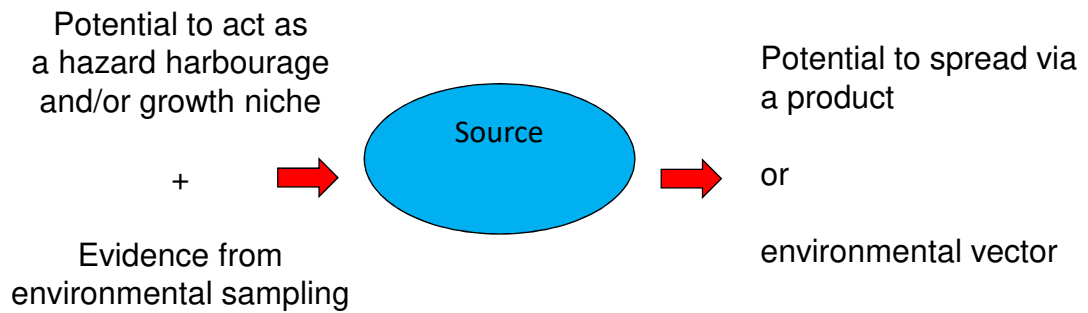
### 7. On-site confirmation of flow diagram

- Sign off diagram(s) as an accurate representation of the processing area and activities

## PEP step 8

8. List all potential hazards, conduct a hazard analysis and consider any measures to control the identified hazards
  - Undertake factory study by LMP team to investigate the defined sources and vectors of environmental and product contamination
  - Sources:- history internal, history external, extensive microbiological sampling.
  - Vectors:- visual assessments and discussions with staff re: all line interventions; physical measurements e.g. of airflow
  - Determine (any) current control options for the identified sources and vectors. Suggest additional/new control options.
  - Assess the need for control validation and verification

## Risk concept for sources



The risk associated with a source is concerned with both the potential of the hazard to be present at the source and, if present, their ability to be disturbed and transfer to the product directly (proximity may be important) or to the process environment

## Risk ranking for sources

The Potential Occurrence X Potential spread = Risk Score

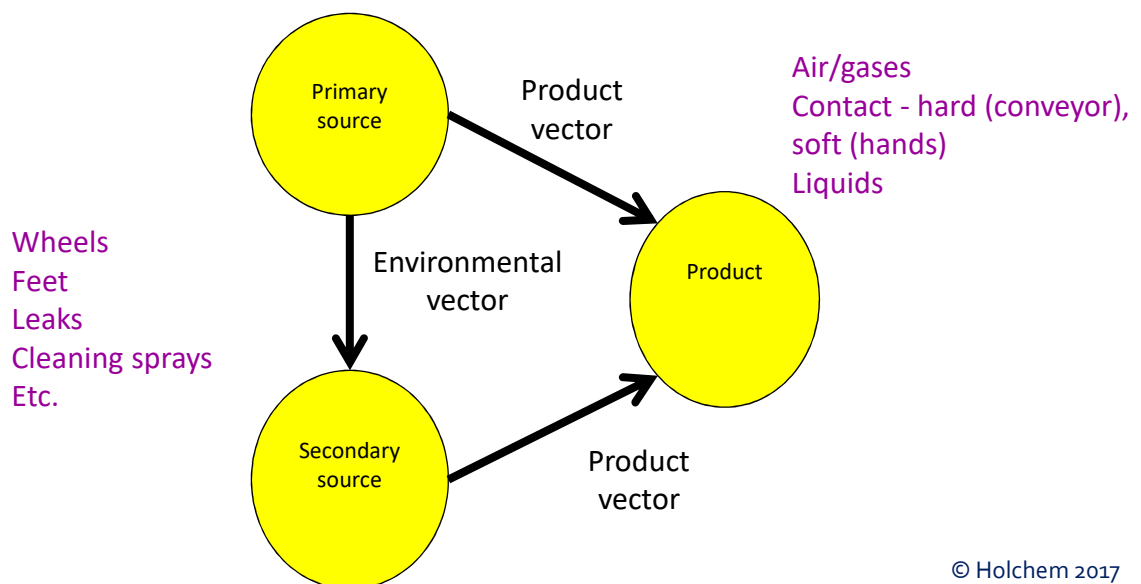
Risk score	Overall risk level	Control
6-9	Very high	Control critical
4	Medium	Control (SOP)
1-3	Very low	No control necessary

# Consider hazard sources



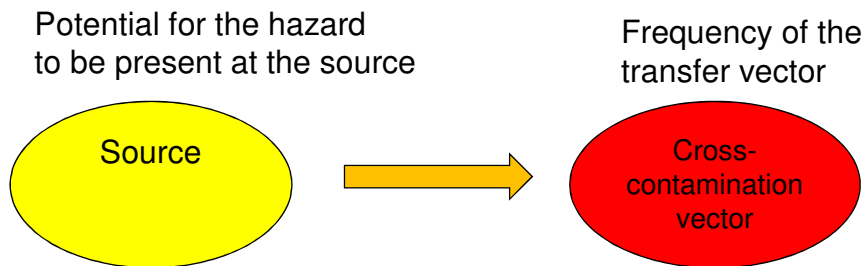
Process step or process activity	Observation	Likely hazard	Sources risk assessment without controls		Risk score	Current or intended source controls	Sources risk assessment with controls		Risk score
			Likelihood of hazard presence LMH	Potential to spread via environmental vectors LMH			Likelihood of hazard presence LMH	Potential to spread via environmental vectors LMH	
Meat slicing	Meat residues were seen on the inside of a switch that operated the machine. If <i>Listeria</i> was present in the switch, it could be transferred to the meat by the operatives finger. Microbiological sampling in the switch was always negative	Listeria	M	L	2	Switches routinely cleaned as part of the end of production sanitation practice	L	L	1
Meat slicing	Fluids were seen oozing out from the joint between the wall and coving. The immediate doorway floor area is a heavy traffic area for personnel and vehicular traffic. Environmental monitoring occasionally identified <i>Listeria</i> spp.	Listeria	H	H	9	Every shift hypochlorous acid is sprayed around the wall/coving joint	M	H	6

# Reduce cross-contamination vectors





## Risk concept for vectors



Note:- a series of vectors could be considered together as a contamination event. For example a contamination event could be entrance into a dryer for cleaning. In this case the transfer vectors may be cleaning equipment, feet, clothing and hands

## Risk ranking for vectors

The Potential Occurrence X Frequency of the vector spread = Risk Score

Risk score	Overall risk level	Control
6-9	Very high	Control critical
4	Medium	Control (SOP)
1-3	Very low	No control necessary

# Consider hazard vectors



Process step or process activity	Observation	Likely hazard	Contamination event vector(s)	Product vector risk analysis without controls		Risk score	Subsequent control step	Current or intended vector controls	Product vector risk analysis without controls		Risk score
				Potential presence of hazard on vector LMH	Frequency of event LMH				Potential presence of hazard on vector LMH	Frequency of event LMH	
Meat slicing	Floor above slicing room is leaking into void above ceiling. The water is seeking channels to run through the ceiling	Listeria	Water drips from the ceiling are occasionally falling directly into product. Drips have tested Lm positive	M	H	6	None	Build catch tray above process line. Periodic disinfection of the catch tray	M	H	6
Meat slicing	Joints on the slicer bed harbour debris. They are impossible to access without total slicer dismantling	Listeria	Lm has been identified in joints	H	H	9	None	Partial dismantling and cleaning and disinfection every night. Steaming every 2 weeks	L	H	3

## PEP step 9

### 9. Determine Operational prerequisites

- Determine whether any hazards will be removed by subsequent control steps
- Determine whether, in the absence of controls, any risks are so significant that they could be described as Operational Prerequisite
- An OP should have the same 'status' as a CCP

## Consider hazard sources



Process step or process activity	Observation	Likely hazard	Sources risk assessment without controls		Risk score	Current or intended source controls	Sources risk assessment with controls		Risk score
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							<b>CAPEX</b>		

## Consider hazard vectors



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							<b>OPR</b>				

## PEP steps 10-11

### 10. Establish control or operating limits

- Likely to be factory based, potentially critical (but unlikely)
- Measurable or observable relative to control

### 11. Establish a monitoring system

- Detection of any loss of control prior to food being cross contaminated
- E.g. ATP, protein, allergen, pH, chemical concentration, temperature
- Establish any national reference methods
- Authority, competence, training

## PEP step 12-14

### 12. Establish a corrective action plan

- Defined actions, product hold procedures

### 13. Verification

- Validation of plan
- Validation of any essential controls
- Environmental sampling plan
- Verification by e.g. microbiological testing
- Audit, trend analysis, customer complaints
- Review – any process or processing environment changes

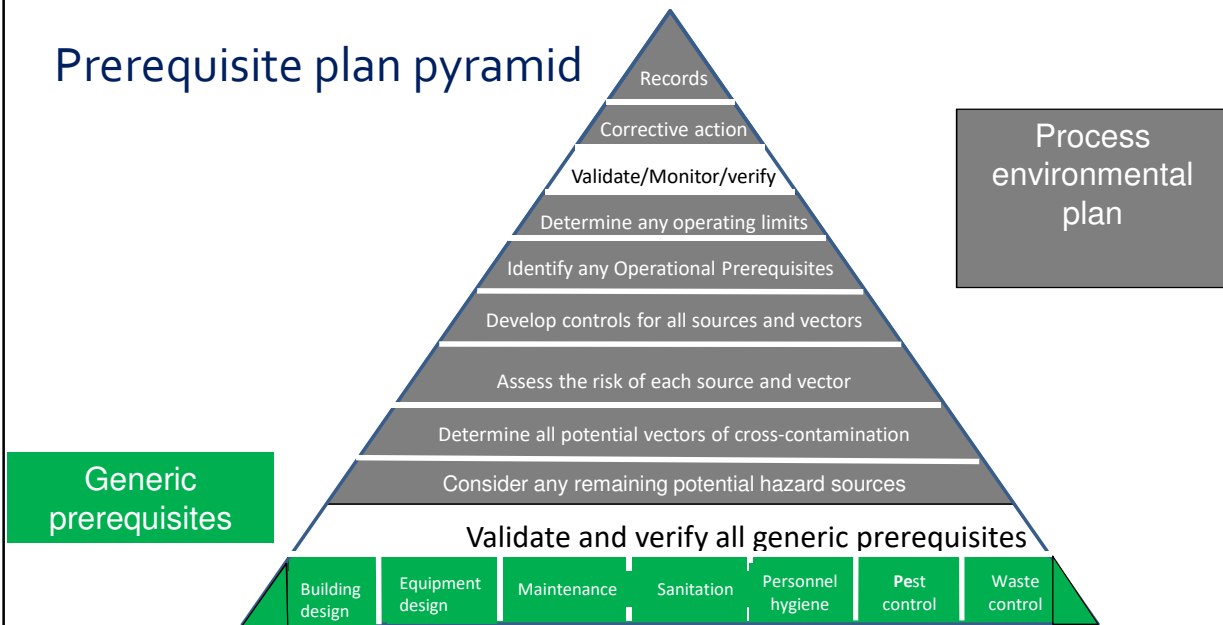
### 14. Establish documentation and record keeping

- All records to demonstrate effective control to customers

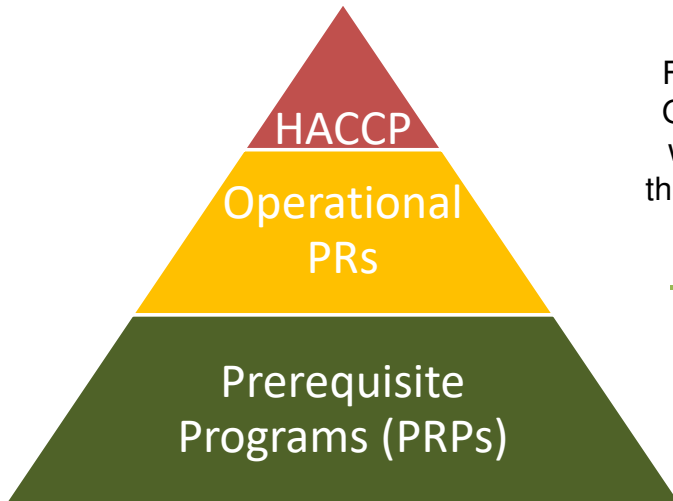
# OPRP management sheet

Process step or area	Likely hazards	Source or Contamination event vector(s)	Control measure(s)	Operating limit(s)	Control monitor(s)	Control verification(s)	Corrective action(s)	Records
Meat slicing	Listeria	Transfer of Lm from slicer bed to product during slicing	Cleaning until visual cleanliness ATP testing prior to disinfection Attachment of thermocouples Encasement of slicer and ancillary components in plastic bag Overpressure of sensitive components Steaming until thermocouples read 70°C and then for a further 30 minutes Drying until moisture free	ATP <150 RLU 70°C 30 min	Visual assessment of freedom of debris ATP assessment prior to disinfection Monitoring of time and temperature	Microbiological verification of slicer bed Thermocouple calibration Timer calibration Steam pressure	Staff retraining Recalibration	Visual cleanliness, ATP and microbiological records Temperature and time records Steam pressure records Calibration records

## Prerequisite plan pyramid



## Conclusion:- HACCP CCPs, OPs and PRs



Failure of a CCP (process) or OP (processing environment) will result in a high likelihood that product may contain a food safety hazard

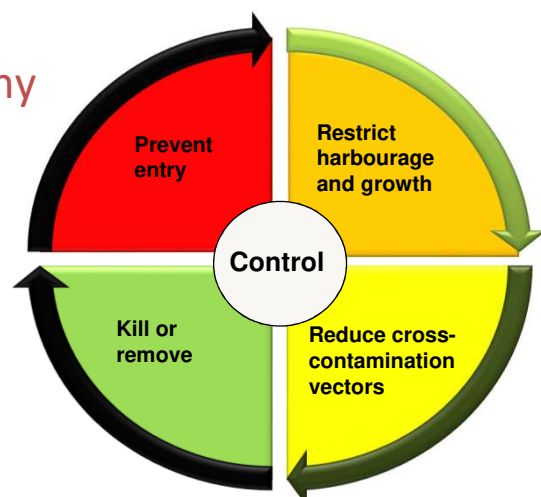
Failure of a PRP may occur without immediate impact on product safety

## Pathogen Control model: 5 Point Plan

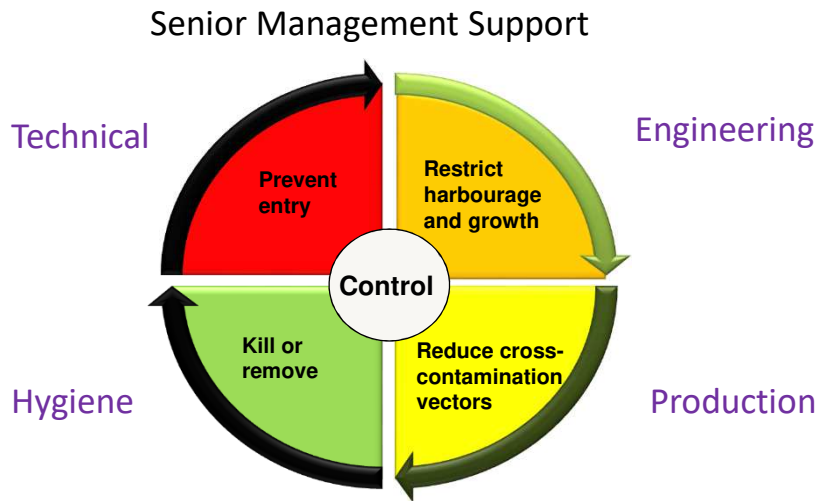
Listeria control philosophy  
(1990/2012)

**Listeria control is more than  
disinfection!**

There is no silver bullet!

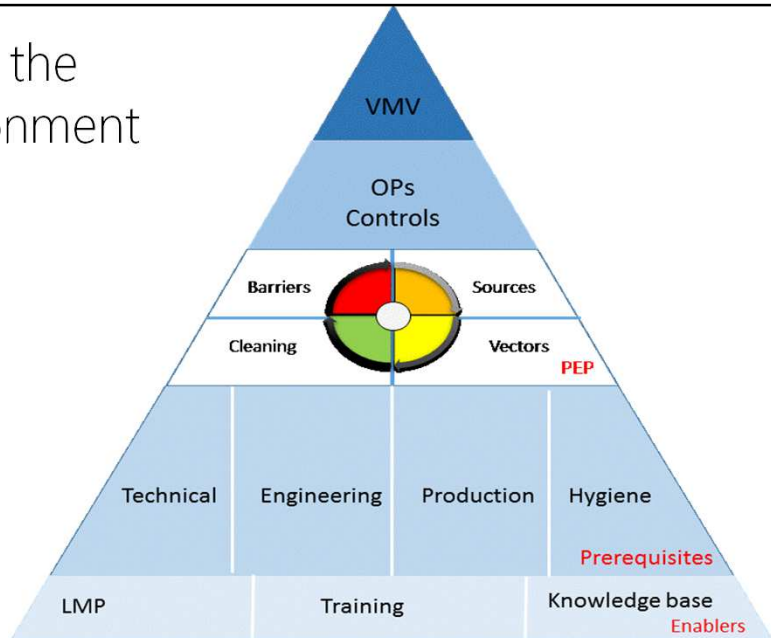


## Responsibilities for Lm control



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## LMP Schematic of the processing environment



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Thank you

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