

DAIRYSAFE has an obligation to actively promote food safety learnings that are important to your business.

Key points –

- The detection of any *listeria* species in the processing environment or in a dairy product must be considered a warning, as *L. monocytogenes* is often found following earlier detections of other *listeria* species.
 - There are legal requirements regarding the notification and reporting of *listeria* species detected in food.
 - *Listeria* species are normally a post-process contaminant and, to manage that risk, an environmental monitoring program is a tool that can verify pathogen control systems are effective.
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What is *listeria*?

Listeriosis a serious foodborne disease associated with significant mortality and is caused by eating food contaminated with the bacterium (germ) *Listeria monocytogenes* (*Lm*). People at high risk for listeriosis include pregnant women and their newborns, adults 65 and older, and people with weakened immune systems. Many healthy people show no symptoms.

Lm is widely distributed in the environment, commonly found in soil, decaying vegetation, sewage and water, and is part of faecal flora in many animals. *Lm* can be found on raw vegetables, in raw milk, smallgoods, cheeses and other ready-to-eat foods.

Lm can tolerate low temperatures as well as high salt levels, which makes *listeria* of particular concern if present in refrigerated foods that are consumed without further cooking.



Impact and epidemiology:

Lm has caused a number of serious outbreaks of food poisoning from dairy products in several countries around the world with various product types implicated

Lm linked to pasteurised milk – in 1985 a large outbreak occurred in the USA from pasteurised milk, where nothing was found at the factory to indicate why a product that is normally 100% safe should have failed, but many processors increased their pasteurisation temperature and holding time as a result.

Lm linked to soft-cheese – in 2013, soft cheeses were recalled in Victoria after they were linked to the deaths of 3 adults, a miscarriage, and other cases of listeriosis. The incident led to the recall of more than 100 products.

Lm linked to Ice Cream – a total of 10 people with listeriosis related to a US outbreak were reported in 4 states: Arizona, Kansas, Oklahoma, and Texas. All ill people were hospitalised. Three deaths were reported in Kansas. These illnesses occurred over an extended period, from January 2010 to January 2015. The company subsequently recalled 8 million gallons of ice cream. It was forced to lay off 1,450 employees, or more than a third of its workforce, and shutdown production at its 3 production plants. In April 2020, the company pleaded guilty to two misdemeanour counts of distributing adulterated ice cream products and agreed to pay a total of \$19.4 million in fines, forfeitures and civil payments.

Killing of *L. monocytogenes*:

Lm is not particularly heat resistant and batch or continuous pasteurising are both designed to reduce population levels by many millions in every mL of raw milk to less than one cell.

In-process or post-process pasteurisation or cooking also has the effect of killing *Lm*.



Control in dairy processing

In the list of outbreaks above, all the products went through a heat process that was enough to eliminate even huge populations of *Lm* in the product. So how did these products become contaminated?

Lm is common in the environment and can enter food premises in many ways, including on the hands, clothing and boots of workers, for which reason dairy factories making soft, ripened cheeses have strict entry requirements.

Other sources include returned milk crates, maintenance personnel, uncontrolled movement of staff into high-care processing areas.

The most critical situation for a food plant however is if *Lm* sets up permanent residence in equipment which contacts pasteurised food. And, if the organism sets up permanent residence in some hard-to-clean area, it may be impossible to prevent recontamination of product without radical action like whole of equipment pasteurisation e.g. heating the process room to >40°C during a long weekend.

Common causes of *Lm* entering your factory:

1. Potential unclean operating and maintenance/repair practices
2. Poor equipment/facility design may create niches in the factory environment
3. Poor management of high-care processing environments and people movement
4. Recontamination from the processing environment is the principal source of *Listeria* contamination to processed Ready-To-Eat foods

Control:

1. Control is unlikely without the ability to first find the organism – factory environments are not sterile – *Listeria monocytogenes* is widespread in the natural environment and is likely to be reintroduced into food production facilities – it is important to investigate and control conditions that create niches or transmit *Listeria* from them.
2. The heating regimes in Standard 4.2.4 (Food Standards Code) are adequate to kill all *Listeria* in raw milk from cows that are not suffering from listeriosis.
3. Preventing entry of *Listeria* is critical — it is an environmental organism and can enter cheese ripening areas unless entrances are well managed.
4. Preventing entry of *Listeria* post pasteurisation is critical and it can enter the finished product areas unless entrances are well managed.

Excellent examples of operating, maintenance and design aspects that contribute to possible *Listeria* presence in the factory can be found in Kornacki Microbiology Solutions, Inc. *Listeria Detection RTE Plants*, 2006.

Notification:

The *Public Health (Notifiable Contaminants) Regulations 2019* require any detection of *listeria* (any species) in food to be reported to SA Health. Dairysafe also requires immediate notification of *listeria* species in food or environment and when pathogens are found in dairy.

Action:

Immediately contact Dairysafe – assistance and advice will be discussed on immediate next steps. When you receive notification of *listeria* in product or your processing environment the next step is to implement your documented company response arrangements and/or follow the Dairysafe pathogen management flowchart (attached).

Further resources and information:

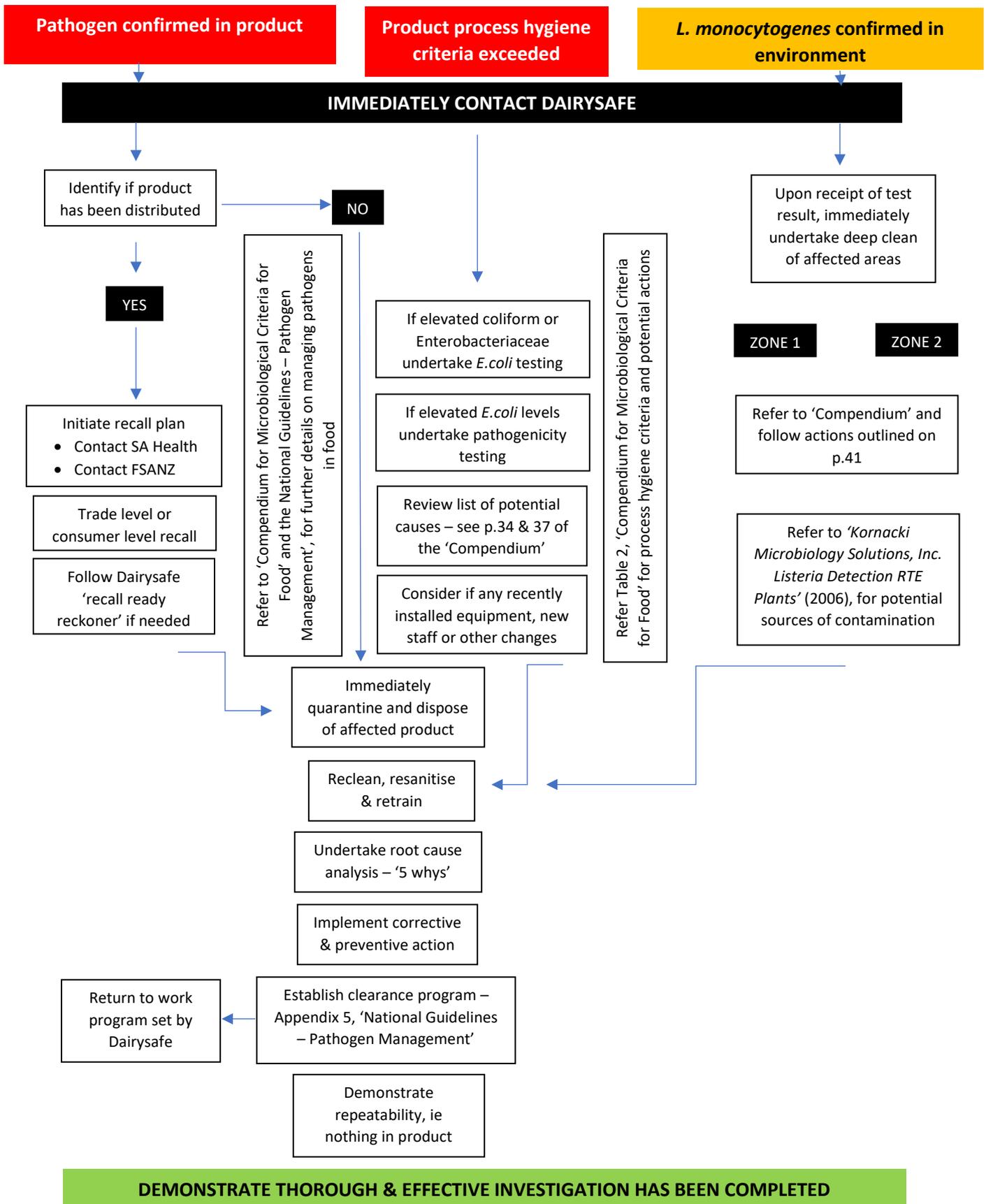
- Kornacki Microbiology Solutions, Inc. *Detecting Sources of Listeria monocytogenes in the Ready-To-Eat Food Processing Environment*, 2006
- New Zealand Food Safety Authority, *Operational Guideline: Design and Construction of Dairy Premises and Equipment*, NZFSA, Wellington, 2006
- Dairy Food Safety Victoria, *Technical Information Note, Listeria monocytogenes – management in dairy factories*, February 2013
- Australian and New Zealand Food and Dairy regulators, *National Guidelines, Pathogen Management, Guidelines for Dairy industry response to pathogen detections in dairy product and the processing environment*, 2013
- Dairy Food Safety Victoria, *Dairy Pathogen Manual*, May 2016
- Dairysafe, *Guidelines for the safe manufacture of dairy products*, 2019



Dairysafe's regulatory management system is certified to the ISO 9001:2015 Quality Standard

PATHOGEN MANAGEMENT FLOWCHART

Advice of presumptive pathogen from sample submitted – SEE OVER PAGE FOR CRITICAL ACTION



CRITICAL ACTION – ADVICE OF PRESUMPTIVE PATHOGEN OR *LISTERIA SPP* IN SAMPLE SUBMITTED

