Listeria Information Update

United Fresh
Technical Advisory Group

The following information is based on a PMA-ANZ Food Safety presentation at the PMA-ANZ Fresh Produce Safety Conference in September 2018. We are providing the information update as it is very useful for the Fresh Produce Industry to understand current thinking about how to manage this complex bacterium.

Introduction

Typically, Listeria has typically been associated with the meat industry, dairy industry, fish and processed foods. However, recent outbreaks in Fresh Produce have highlighted that Listeria, whilst rarely seen, is a concern for the fresh produce industry.

About Listeria

L.monocytogenes (Listeria) is found everywhere. The bacterium occurs widely in agricultural, aqua-cultural and food processing environments. A higher prevalence has been found in soils recently cultivated, irrigated or rained upon, and soils close to pastures.

In addition, healthy individuals can be asymptomatic carriers of Listeria. It is estimated that 5 to 10% of people carry the bacterium without being sick (healthy people being found to shed Listeria in their faeces). It is also known that livestock shed listeria in their faeces in higher quantities without falling sick.

So why is listeriosis so rare? It is often only displayed in the 'at risk' groups. Nevertheless, normal healthy people can be infected as well. So why is it that we do not see large numbers of new Listeria cases every year?

Not all Listeria bacterium are created equal. There are 17 species of Listeria, nearly all of which are harmless and do not cause disease to humans or animals. Only two species of Listeria have been implicated in animal and human disease:

- *L.monocytogenes*
- *L.ivanovii*

The Fresh Produce industry is primarily concerned with two serotypes of *L.monocytogenes*

- **Infectious *L.monocytogenes*** - causes disease in both humans and animals. It is very rare and only found in diseased animals/humans
- **Environmental *L.monocytogenes*** - does not cause disease either to humans or animals. It is very common and found everywhere

However, what we do not fully understand yet, is if Environmental *L.monocytogenes* can become infectious once it enters a host.

Why is Listeria an Issue for the Fresh Produce Industry?

We know that fresh produce is contaminated mostly by Environmental strains of *L.monocytogenes*. The questions we are asking are:

- Do these remain non-infective after ingestion by humans?
- Have rare food poisoning outbreaks only been caused by Infectious *L.monocytogenes* from active infectious shedders (human or animal) and not Environmental *L.monocytogenes*?
- Can we differentiate between the two by testing?

Notwithstanding this, the Fresh Produce industry must gain a better understanding of:

- Where Infectious *L.monocytogenes* is found? And where does it come from?
- What practices should be adopted to reduce the risks?
- What Fresh Produce and which farming locations are at high risk?
- Are there improved approaches to investigating real causes of outbreaks?

Testing is relatively crude at present. A rapid test confirmation of positives could take up to one week in order to get enumeration to get an idea of the severity of the problem.

The potential for growth of the number of outbreaks is high. The Fresh Produce industry is less mature, and more complacent regarding Food Safety than other sectors.[1] This contributes to:

- A lack of knowledge and awareness of microbial Food Safety. Listeria sources and risks are not well understood
- Poor understanding of washing and sanitising
- Poor equipment design and hygiene practices in the packhouse environment.

Contributing Factors for Listeria Outbreaks

There are many factors that contribute to the introduction and spread of Listeria in a packhouse[2]

- Packhouse and warehouse hygiene
  - Equipment must be cleaned on a routine basis to prevent the build-up of dirt, product build-up and corrosion
  - Washing and drying equipment, previously used for other raw produce, must be thoroughly cleaned and sanitised between uses
  - Water must not be able to pool on floors – this contributes to moisture build-up
  - Personnel driving forklifts and other moving equipment must be aware of what they are moving and where. For example, driving past Fresh Produce after going to the rubbish site risks contaminating the Fresh Produce[3].
- Postharvest practice
  - Fresh Produce is often pre-cooled prior to washing and storage. Fruit harvested in the warmth, plus moisture, provide ideal conditions for *L.monocytogenes* to flourish during cold storage.
- Weather and environmental factors
  - Heavy rain prior to harvest may splash Listeria from the soil onto the surface of fruit. The surface of the rockmelon, in particular, encourages the growth of *L.monocytogenes*, as the rough skin traps dust and particles.
  - Close proximity to livestock

Examples of Listeriosis

Between June 1998 and March 1999 there were 9 reported cases of Listeria among elderly people in the Hunter Valley, NSW, Australia[4], and 6 people died. The vehicle was commercially prepared fruit salad containing rockmelon.

An outbreak of Listeriosis in the USA[5] was linked to rockmelons at a packhouse in Colorado and contributed to a recorded number of 147 cases, including 33 deaths, between 2011 and 2012.

A more recent outbreak of Listeria occurred in early 2018. There were 19 cases of listeriosis reported, resulting in 7 deaths and 1 miscarriage. The vehicle was identified as rockmelon from a single grower in Australia. Trace activities then tracked melons from the grower to a further 10 countries world-wide.

Closing Comments

This update is intended to provide information on the current thinking about Listeria.

1 Dr Craig Shadbolt & Suresh DeCosta
2 Dr Craig Shadbolt
3 Dr Craig Shadbolt
4 http://www.centerforproducesafety.org/amass/documents/document/263/Listeria%20Guidance%20UFPA%202013.pdf
5 https://www.cdc.gov/listeria/outbreaks/cantaloupes-jensen-farms/index.html