



Listeria



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Voluntary Recall 07/19/2014



What the Industry Learned from the Recent *Listeria* Recalls and Outbreaks

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Definitions

- **Recall**
 - Withdrawal of product from the market because it is potentially contaminated with *Listeria monocytogenes*
 - **Recalls often occur when no one is sick!**
- **Outbreak**
 - Two or more people get same illness from eating the same food which was contaminated with the same pathogen
- **FDA and CDC are now very good at determining the source of the contamination**
 - **Find contaminated food**
 - **Microbiological Testing and Conventional Epidemiology**
 - **Find DNA match between bacterial strain(s) from patients, food and packing/processing plant environment**
 - **Molecular Epidemiology**



Listeria monocytogenes



- Dangerous foodborne bacterial pathogen
 - One of 7 different species of *Listeria*
 - Other 6 species are NOT pathogenic to humans
 - 13 serotypes of *Listeria monocytogenes*
 - Most cases and outbreaks due to 3 serotypes:
 - 4b, 1/2a and 1/2b
 - People have to consume high levels to get sick
 - Affects mostly immunocompromised people
 - Long incubation period – up to 70 days after ingestion
 - High fatality rate for those that do get sick (20-30%)
 - Death by meningitis and blood stream infections
 - Adulterant in Ready-to-Eat Foods
 - Zero-tolerance policy

Listeria monocytogenes



- Widespread in nature
 - Common in nature
 - Soil, water, sewage, silage
 - Various wild and domestic animals
 - Common in food processing plants
 - Especially in wet, hard-to-clean areas
 - Usually transfers to foods during contact with equipment
 - Grows very rapidly at body temperature and slowly at refrigeration temperature
 - Grows on sliced/punctured fruits and vegetables
 - Also grows on germinated bean sprouts

Listeria monocytogenes

- Needs 4 things to reach high (dangerous) levels
 - Food
 - Water
 - Time
 - Temperature



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- These conditions are present in hard-to-clean “harborage sites” within food processing plants and in juices released from sliced, diced or punctured fruits and vegetables, and from germinated seeds

Recent Recalls Due to *Listeria monocytogenes*

- **Salads**
 - May, 2012 – River Fresh Foods
 - August, 2012 – Fresh Express
 - October, 2013 – Boston Salads
 - October, 2013 – Winn-Dixie
 - March, 2014 – Fresh Express



Recent Recalls due to *Listeria monocytogenes*

- **Sliced Apples**

- August 6, 2012 – Reichel Foods, Inc.
- August 10, 2012 – Missa Bay, LLC
- December 8, 2012 – Freshway Foods
- November 7, 2013 – Garden-Fresh Foods
- November 14, 2013 – Crunch Pak®
- December 11, 2014 – Giant Eagle/Del Monte

- **Gala apples grown in Pennsylvania**



Recent Recalls due to *Listeria monocytogenes*



- **2014 Stone Fruit Recall**

- Wawona Packing Company - Cutler, California
- **Peaches, plums, nectarines and pluots**
- *Listeria monocytogenes* first detected on Wawona product by the Australian government
- *Listeria monocytogenes* subsequently detected by the company on 2 nectarines and 1 peach, but not detected in environmental samples
- Source of the *Listeria* is still unknown
- No human cases reported
- Resulted in voluntary nationwide recall

Recent Recalls due to *Listeria monocytogenes*

- **Sprouts**, January, 2012 – Green Valley Food Corp.



- **Diced red onions**, May, 2012 – Gills Onions



- **Mangoes**, May, 2014 – Pacific Organic Produce



Latest Recall – January, 2015

Frozen Unpasteurized Fruit and Vegetable Smoothies



***Listeria monocytogenes* found in the raw ingredients, not in the product itself**

U.S. Produce Outbreaks 2004-2012

1. Norovirus	223
2. Salmonella spp.	71
3. Pathogenic <i>E. coli</i>	46
7. <i>Listeria monocytogenes</i>	3

***Listeria monocytogenes* is a major cause of recalls!**

- **Widespread in nature and food processing plants**
- **Tough bacterium**
- **Grows at refrigeration temperatures**

Recent Outbreaks Linked to *Listeria monocytogenes* contamination of Fruits and Vegetables

- Diced celery - 2010

- 10 sick and 5 dead at 5 hospitals in Texas
- Source = one processing facility in Texas



- Cantaloupe - 2011

- 147 sick and 33 dead in 28 States
- Source = one processing facility in Colorado
- Sliced by consumers



- Mung bean sprouts - 2014

- 5 sick and 2 dead in 2 States
- Source = one processing facility in Illinois



- Commercial pre-packaged caramel apples - 2014

- 32 sick and 7 dead in 11 States
- Source = one packing facility in California
- Processed by 3 caramel apple companies
 - 2 in Missouri and 1 in California
- Extended sell-by dates
 - Up to 3 months



Common Features in These Outbreaks

- ***Listeria monocytogenes* contamination occurred in one packing/processing facility**
 - Where food, moisture, time and temperature were available (especially in harborage sites)
- **Unique (persistent) strains were found in each facility**
 - Suggests that highly adapted strains colonize environments within the different packing/processing plants
 - Same phenomenon has been observed in other types of RTE foods
 - Meat
 - Poultry
 - Dairy
 - Mushroom
- **All outbreaks were due to products that were either sliced, diced, punctured or germinated**
 - Provided nutrient-rich juices, which allowed *Listeria monocytogenes* to grow to high (dangerous) levels

FDA

Factors in Processing Plants Related to Outbreaks

- Water allowed to pool on the floor
- Floor of the packing facility was difficult to clean
- Packing/processing equipment was not easily cleaned and sanitized
- No pre-cooling step to remove field heat before cold storage



Controlling *Listeria* with the 3 K's

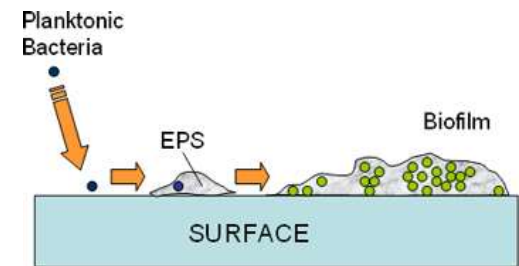
- **Kill them**
 - Heat
 - Sanitizers
- **Keep them out**
 - Good cleaning and sanitizing
 - Barriers between raw and processed areas
 - Proper packaging
- **Keep them from growing**
 - Good refrigeration in processing and storage areas
 - Reduce water and nutrient-rich juices
 - Reduce the sell-by date

Preventing *Listeria* Contamination

- Remember what *Listeria* needs to grow!
 - Food
 - Water
 - Time
 - Temperature
 - The closer to body temperature, the faster they grow!
- Take as many of these factors away as possible!

Preventing *Listeria* Contamination

- **Eliminate harborage sites!**
 - Replace with cleanable surfaces!
 - No cracks, pits, porous materials, hollow rollers, etc.
 - Especially on food-contact surfaces!
 - If you can't clean it, you can't sanitize it!
- **Thoroughly clean and sanitize daily**
 - Especially important for food-contact surfaces
 - Sanitize with quaternary ammonium compounds (QACs)
 - More effective against *Listeria* than chlorine compounds
- **Use good personal hygiene and gloves**
 - Especially after using the toilet and touching potentially contaminated surfaces and before handling finished products



Preventing *Listeria* Contamination

- Keep the processing area and products cold
 - The closer to 0°C (32°F) the slower *Listeria* grows
 - Especially important for sliced, diced, punctured products
- Reduce the sell-by date
 - Eliminates TIME needed for growth and keeps the product fresher



Preventing *Listeria* Contamination

- **Test the environment for *Listeria* genus (includes all 7 *Listeria* species)**
 - Indicates the possible presence of *Listeria monocytogenes*
 - Especially important to test food-contact surfaces prior to the start-up of operations
 - Also take samples in non-food-contact zones and during operation
- **Goal is to hunt, find and destroy *Listeria*!**
 - May have to replace floors, drains and processing and packaging equipment with **materials that are cleanable!**



Questions?

