Food Safety and Inspection Service
Protecting Public Health and Preventing Foodborne Illness
Risk Assessments and the Changing Landscape of Foods Linked to *Listeriosis* Outbreaks

Janell Kause
Scientific Advisor for Risk Assessment
Office of Public Health Science
Food Safety and Inspection Service, USDA

InFORM 2017 Conference
Garden Grove, CA

November 7, 2017
1980s-1990s: Large-scale outbreaks of listeriosis (dairy/hot dogs/deli meats)

1998-1999 Hot Dog & Deli Meat Outbreak (108 cases, 14 deaths)

Several weeks between infection and symptoms – most cases sporadic
Application of Risk Assessment to Guide Policies & Inspection Activities

Historical outbreaks compared to the FDA/FSIS risk assessment findings.
How Effective Are *Lm Controls and Sanitation in Mitigating Risk?*

**Sanitation & Product Testing**

- **Alternative 3:** Rely on testing & sanitation alone

**Process Control Options**

- **Alternative 2a:** Use post-lethality treatment
  
- **Alternative 2b:** Use antimicrobial agent

*Proposed mandatory testing:* 4, 2, 1 samples/month for large, small, and very small plants

**FSIS Deli Meat Risk Assessment (2003); Listeria Rule (9 CFR 430)**
**Risk-Based Inspection: *Listeria monocytogenes***

- **Risk ranking algorithm:**
  - Lm control (Alt 1, 2 a/b, 3)
  - type of product being made
  - production volume
  - 6 month sampling history

- **Schedule sample collection according to this risk ranking monthly**

- **Allows FSIS to target finite resources at those establishments that are most likely to produce contaminated product**

- **Provides incentive for establishments to adopt effective *Lm* control measures**

**Source:**
Food Safety and Inspection Service:
Impact of Risk-Based Inspection Activities

Significant decline of *Lm* in ready-to-eat meat and poultry products – from 0.72% in CY2005 to 0.32% in CY2014

*FSIS results of routine regulatory testing of finished RTE meat and poultry products analyzed for *Lm* (1990-2014). Approximately 4,000-10,000 samples taken annually.*
### Listeriosis Outbreaks: RTE Meat and Poultry Products

*Adapted from Cartwright et al. 2013*

<table>
<thead>
<tr>
<th>Year</th>
<th>Hot Dogs</th>
<th></th>
<th>Deli Meats</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Deaths</td>
<td>Cases</td>
<td>Deaths</td>
</tr>
<tr>
<td>1998</td>
<td>112</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1999</td>
<td>4</td>
<td>0</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>2000</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>2001</td>
<td>0</td>
<td>0</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>2002</td>
<td>0</td>
<td>0</td>
<td>54</td>
<td>8</td>
</tr>
<tr>
<td>2003</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2004</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2005</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>2006</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2007</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2008</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2009</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2010</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>2011</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

✔ No listeriosis outbreaks associated with federally inspected RTE meat and poultry products in over a decade.
Food Safety and Inspection Service: Why the Plateau in Listeriosis Cases?

*USDA-FSIS regulatory testing results in RTE products (http://www.fsis.usda.gov/wps/wcm/connect/d2aedcb2-4890-42fc-9960-57a6a5bf3ecd/Figure-1-RTE-Testing.pdf?MOD=AJPERE)

Food Safety and Inspection Service:
Changing Landscape for Listeriosis Outbreaks

Food Safety and Inspection Service

Other Contributors to Listeriosis?

- Improvements in Outbreak Detection
  - Listeria Initiative, initiated in 2003
  - Whole Genome Sequencing of clinical and food isolates (started: 2011)

Downstream contamination (retail)? Other food vehicles?
Which Foods Posed the Greatest Risk of Listeriosis? – “Now”

- Changing landscape of foods linked to listeriosis outbreaks:
  - Re-evaluate what we know to protect U.S. consumers

Current listeriosis outbreaks associated with foods considered to be “low risk” based on past risk assessment.
Where do we go from here?