State of the Plate

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Office of Food Protection
RI Department of Health

November 13, 2013
Foodborne Illness in the U.S.

- 47.8 million illnesses each year
- One person in 6 ill each year
- 128,000 hospitalizations
- 3,000 deaths
- $5 to 6 billion in medical costs and lost productivity
Estimated Foodborne Illness in Rhode Island

- 160,000 illnesses each year
- 428 hospitalizations
- 10 deaths
- $16,730,000 to $20,075,000 in medical costs and lost productivity
The Food that Made You Ill Is Probably Not the Last Food that You Ate

- **Norovirus**: 12-48 hours
- **Salmonella**: 6 to 72 hours
- **Campylobacter**: 2 to 5 days
- **E. coli O157:H7**: 1 to 10 days
- **Listeria**: 3 to 70 days

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Decrease</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campylobacter</td>
<td></td>
<td>14% ↑</td>
</tr>
<tr>
<td>Listeria</td>
<td></td>
<td>6% ↓†</td>
</tr>
<tr>
<td>Salmonella</td>
<td></td>
<td>3% ↑†</td>
</tr>
<tr>
<td>Shigella</td>
<td></td>
<td>13% ↓†</td>
</tr>
<tr>
<td>STEC* O157</td>
<td></td>
<td>10% ↓†</td>
</tr>
<tr>
<td>Vibrio</td>
<td></td>
<td>43% ↑</td>
</tr>
<tr>
<td>Yersinia</td>
<td></td>
<td>6% ↓†</td>
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</tbody>
</table>

*Shiga toxin-producing Escherichia coli
†Not statistically significant

% change compared with 2006–2008
Reported Foodborne Illness, Rhode Island, 1990-2012

Campylobacteriosis, Salmonellosis, Hepatitis A, E. coli 0157:H7, Listeriosis, Shigellosis

Year | Number of Cases
--- | ---
1990 | 619
1991 | 737
1992 | 640
1993 | 600
1994 | 534
1995 | 537
1996 | 492
1997 | 582
1998 | 410
1999 | 433
2000 | 411
2001 | 412
2002 | 360
2003 | 353
2004 | 314
2005 | 305
2006 | 301
2007 | 270
2008 | 335
2009 | 329
2010 | 302
2011 | 266
2012 |
RI Part of CDC Environmental Health Specialist Network (EHS-Net)

- Since RI Imports almost all of its food, looked at illnesses for surrounding states
  - MMWR
  - Census numbers to compare illnesses per 100,000 population
### U.S. Census Estimates

<table>
<thead>
<tr>
<th>State</th>
<th>2012 Population</th>
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</thead>
<tbody>
<tr>
<td>NY (Upstate)</td>
<td>11,233,564</td>
</tr>
<tr>
<td>NY City</td>
<td>8,336,697</td>
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<tr>
<td>Massachusetts</td>
<td>6,646,144</td>
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<tr>
<td>Connecticut</td>
<td>3,596,347</td>
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<tr>
<td>Maine</td>
<td>1,329,192</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>1,320,718</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>1,050,292</td>
</tr>
<tr>
<td>Vermont</td>
<td>626,011</td>
</tr>
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</table>
# U.S. Census Estimates

<table>
<thead>
<tr>
<th>Region</th>
<th>2012 Population</th>
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<tbody>
<tr>
<td>New York</td>
<td>19,570,261</td>
</tr>
<tr>
<td>New England</td>
<td>14,562,704</td>
</tr>
<tr>
<td>Region</td>
<td>34,132,965</td>
</tr>
<tr>
<td>United States</td>
<td>313,914,040</td>
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## Healthy People 2020 Objectives for Food Safety

<table>
<thead>
<tr>
<th>Objective</th>
<th>Pathogen</th>
<th>Cases per 100,000 population</th>
<th>US Baseline (2012)</th>
<th>NE Baseline (Based on 2012 data)</th>
<th>National 2020 Target</th>
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<tbody>
<tr>
<td>FS-1.1</td>
<td>Campylobacter</td>
<td></td>
<td>14.3</td>
<td></td>
<td>8.5</td>
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<td>FS-1.2</td>
<td>Escherichia coli O157:H7 (STEC)</td>
<td></td>
<td>1.1</td>
<td>1.4</td>
<td>0.6</td>
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<tr>
<td>FS-1.3</td>
<td>Listeria monocytogenes</td>
<td></td>
<td>0.3</td>
<td>0.4</td>
<td>0.2</td>
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<tr>
<td>FS-1.4</td>
<td>Salmonella</td>
<td></td>
<td>16.42</td>
<td>13.7</td>
<td>11.4</td>
</tr>
</tbody>
</table>
The Good News
Hepatitis A Controls Have Worked Nationally

- Childhood Vaccinations
- No hand contact of ready-to-eat foods
- Exclude ill personnel
- Thorough handwashing
RATES of Shigellosis in US, New England, Rhode Island, & New England States
(2002-2012)
Shigellosis

- Northeast about ½ national rate
- Mass. higher due to better reporting?
- In 2009, MA, RI and NH cases increased. Decreased next year
- Mid Atlantic and E. N. Central more than doubled from 2011 to 2012
  - including Ohio, NJ, and NY
- Child care settings cited as a major source in Ohio
Shigellosis

- Said need to watch at NEFDOA in Nov. 2012
- In July, about 150 ill at a beach where we have not had bad samples
  - Many swam in child area near slide
  - Concern a cluster bomb
    - How many ill work in food, day care or health care?
Shigellosis

- Did press release
  - Don’t work in food establishments, day care and healthcare if ill
  - Don’t prepare food for others if ill
  - Need excellent hand washing
  - No hand contact of ready-to-eat foods
- Same controls for Norovirus
Five Year Trend of Shigella in Rhode Island ...and 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>other S. species</th>
<th>Probable</th>
<th>S. sonnei</th>
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<tbody>
<tr>
<td>2008</td>
<td>4</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>2009</td>
<td>8</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>2010</td>
<td>3</td>
<td>0</td>
<td>13</td>
</tr>
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<td>2011</td>
<td>3</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>2012</td>
<td>9</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>2013</td>
<td>10</td>
<td>116</td>
<td>123</td>
</tr>
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</table>
Confirmed and Probable *S. sonnei* by Outbreak, Rhode Island, June 22, 2013 – September 30, 2013

Note: Event date is generated based on the availability of data in the following order:

1. Illness onset date,
2. Specimen collection date,
3. Date of report to public health agency.
Campylobacteriosis

- From 1990-2011, Campylobacteriosis in RI decreased by over half.

- In 2012, Campy spiked in RI and nationally. Why?
Reported Campylobacteriosis, RI, 1990-2012

Number of Cases

Year


136 124 111 116 137 137 137 143 148 155 145 176 177 178 174 192 201 191 241 213 217 0 50 100 150 200 250 300
2013 YTD Campylobacter Rates

2013 YTD Rate of Campy Cases in US and New England

<table>
<thead>
<tr>
<th></th>
<th>Rate (per 100,000)</th>
</tr>
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<tbody>
<tr>
<td>United States</td>
<td>14.32</td>
</tr>
<tr>
<td>New England</td>
<td>14</td>
</tr>
<tr>
<td>Connecticut</td>
<td>15.4</td>
</tr>
<tr>
<td>Maine</td>
<td>6</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>16.6</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>9.4</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>11</td>
</tr>
<tr>
<td>Vermont</td>
<td>19.2</td>
</tr>
</tbody>
</table>
Campy Rates 2011-2013
Campylobacter

- Foreign travel
- Undercooked poultry (recently undercooked chicken livers in pates)
- Turkey or chicken cooked outside the home
- Other meat cooked outside the home
- Raw milk
- Raw seafood
- Living on or visiting a farm
- Contact with farm animals
- Contact with puppies

Source: Art Liang CDC
How to Avoid Campylobacteriosis

- Thoroughly cook poultry and eggs
  - Campy found in egg yolks in breeder hens
- Thoroughly wash hands, cutting boards, etc. after handling raw poultry.
- Avoid unpasteurized milk (“basket cheese”)
- Avoid contact with the infected stool of an ill dog or cat.
Population-based Case-control Studies

**E. coli O157**

- pink hamburger
- farm animals
- eating at a table-service restaurant

(Source: Art Liang CDC)
RATES of Shigatoxin-producing E. Coli (STEC) in Rhode Island, New England States, & New York State (2002-2012)
E. coli 0157:H7 Controls

- Thorough Cooking of Ground Beef Especially for Kids under 5 Years Old
  - Changed national Food Code to require foods on children’s menus to be thoroughly cooked
- Consumer advisory

- Pasteurize Cider and milk
  - Testing raw milk cheeses and soft cheeses

- Don’t Use Uncomposted Manure for Fertilizer (Organic) or contaminated water for irrigation of ready-to-eat crops
RATES of Listeriosis
in Rhode Island, New England States, & New York State
(2002-2012)
Listeriosis

- Rate in Northeast higher than U.S. rate
- In 2008-09 in NE, had outbreaks and illnesses due to soft cheese plants in NJ and New York
- Recalls due to sprouts from Conn. and Mass.
- 2013 Boston Salad recalls
Listeriosis

- Incubation Period 3-70 days
- High Risk Foods
  - Unpasteurized (raw) milk and cheeses
  - Soft cheeses
  - Deli meat and hot dogs
    - Especially sliced turkey and other products sliced at deli
  - Smoked seafood
  - Sprouts…
  - Grows at refrigerator temps
Listeriosis

- Conducted Listeria risk assessment study as part of EHS-Net with USDA looking for risk factors
  - Data being analyzed
  - Role of slicers in salmonellosis and listeriosis?
  - Deaths from manufacturing slicer at Maple Leaf Plant in Canada
RATES of Salmonellosis
in US, New England, Rhode Island, & New York State
(2002-2012)
RATES of Salmonellosis
In Rhode Island, New England States, & New York State
(2002-2012)
Salmonella infections:

Since 1996–1999, incidence of human SE infection in FoodNet has increased by 44%.

- Greatest increases were in young children, older adults, and FoodNet sites in the southern United States. “…chickens from which SE was isolated has increased.”

”problem is growing. Chicken and eggs are likely major sources of SE.”
THE THING ABOUT HOMEMADE MAYO...

Homemade mayonnaise "cures" for several hours before going to market. And by that we mean, the acids in the vinegar and lemon juice are left to do "their thing" on the raw eggs, thereby killing anything that may have lingered AND, also extending the shelf life, as they say. We SAY 1 week in the fridge on the label, but you might be able to get 2 or maybe even 3 weeks from it. This is by no means a guarantee, just some helpful information to tuck in the back of your mind!

BON APPETIT!
Salmonella infections:

- RI illnesses increased 2009-11
  - Luxe Burger
    - Tomatoes from Florida and Globe slicer
  - Salami outbreak implicating pepper from Vietnam, China and India
  - Italian cream filled pastry
    - 82 ill, 4 deaths
  - 2012 RI cases down by 60%
- Mass. – why a drop in 2011?
Georgia tested slicers as a result of a Salmonella outbreak
Globe Slicer - Area under white plastic piece (secured with screw) tested + for Salmonella
RI Outbreak May 2010
Globe Slicer-Model 3600

Blade side view of slicer blade guard

Non-removable, non-cleanable white plastic on inside of blade guard was Salmonella + PFGE match to outbreak
Area between blade and guard could not be easily cleaned and sanitized

Area under foot was also positive for RI outbreak strain of Salmonella
Commercial Deli Slicer Inspection Tips for Food Safety Professionals

- Mechanical deli slicers commonly used in retail and foodservice establishments to slice meats, cheeses and produce may become difficult or impossible to adequately clean and sanitize after a period of use.
- Recent foodborne illness outbreaks have been associated with the accumulation of food soils and disease-causing microorganisms on areas of commercial deli slicers that are difficult to clean and sanitize.
- These outbreaks have resulted in serious illnesses and hospitalizations.

There are many seams created between the numerous adjoining parts and components of a typical deli slicer. Sealants and gaskets are often used to seal these seams. These seams can become worn, degraded or removed as a result of the heavy use and cleaning regimens to which deli slicers are subjected. As these seals and gaskets become degraded, spaces can be created that can trap debris and moisture, which can lead to areas that may not be adequately cleaned and sanitized under normal cleaning methods.

During routine inspections of retail and foodservice establishments:

- Pay special attention to commercial deli slicers.
- Examine the equipment for degraded, defective or worn parts.
- If there are any signs of cracks, chips, deep scratches or loss of adhesion or if any seam or part is found defective or damaged, have the food establishment remove the slicer from service until repaired or replaced.
- Stress that establishment managers need to contact the slicer manufacturer for repairs and maintenance; all repairs should be performed by the manufacturer’s authorized service representatives.
- Check that the retail or foodservice establishments are following the manufacturer’s instructions for cleaning and maintenance.

NSF/ANSI Standard 8, Commercial Powered Food Preparation Equipment

Most slicers used in food establishments are models that have been certified to the NSF/ANSI (American National Standards Institute) Standard 8, Commercial Powered Food Preparation Equipment by an ANSI accredited certification body. However, these certifications are issued for newly manufactured products only, and do not ensure that the slicer will be maintained in a cleanable condition after extended use. Once in the field, slicer seal and gasket life will be affected by a variety of factors such as conditions of use, type and frequency of cleaning protocols, and types of foods being sliced. Since slicers typically remain in use for a number of years, operators and regulators must be diligent in their inspection, evaluation and maintenance of this equipment.

For additional copies and more information visit: www.fda.gov/retailfoodprotection

If you are inspecting the facility as part of a foodborne illness outbreak investigation:

- If a slicer is suspected as a source of contamination, breaking down slicers (including the disassembly of components attached with fasteners) may be necessary to examine if any seal or seal degradation has occurred that may result in contamination of food.
- If collecting environmental samples, be sure to swab surfaces and niches on the slicer where cross contamination hazards may have been created, such as seals and seams in or near the food contact zones.
Greatest Predictor for Listeriosis is
Consuming Luncheon Meat Sliced at
the Deli

- Role of slicers in question
- NSF national standards for slicers changed effective November 2012
- Take unsafe slicers out of service
Foods associated with *Salmonella* outbreaks*

- Poultry: 29%
- Eggs: 18%
- Pork: 12%
- Beef: 8%
- Vine vegetables, fruits, and nuts: 13%
- Other †: 20%
To avoid Salmonella infections:

- Don't drink unpasteurized milk.
- Don't eat undercooked poultry (including turkey) and poultry products such as eggs.
  - Eggnog
- Avoid contact with infected domestic and wild animals, including poultry, pigs, cattle, and pets such as turtles, iguanas, chicks, dogs, and cats.
- Wash hands after any animal contact (including petting zoos)
To avoid Salmonella infections:

- FDA risk assessment done as a result of our outbreak investigation
  - 12% of spices are contaminated
  - 7% contaminated with Salmonella
- Buy spices from reputable sources
- Add spices before cooking not after
Global Warming - Major Increase in Vibrio Illnesses from Raw Shellfish in Northeast

Due to illnesses in Summer, shellfish closures in NY, Connecticut and Massachusetts in last two years

FDA recommending Vibrio control plan
- Chill shellfish within 5 hours of harvest

Identify source of shellfish implicated in illnesses quickly – share findings with CDC, FDA and neighboring states
Recurring Outbreaks from Same Sources

- *E. coli* O157:H7 from leafy greens
- *Salmonella* from tomatoes
- Listeria from same processors
- Two *Salmonella* outbreaks with same genetic fingerprint 10 years apart from same cereal processor
- Repeated outbreaks from certain restaurants and manufacturing facilities.
Direction

“Go After the Bad Guys”
- Find the underlying cause and eliminate it or the problem is likely to happen again

Implementing awarded grants
- Rapid Response Team
- Manufacturing Standards
- Retail Standards
- Improve Recall Effectiveness
- CDC EHS-Net Research Grant
Establish monitoring procedures that focus on critical processes and practices

- Exclude ill workers
- No bare hand contact of ready-to-eat foods
- Cooling
- Hot Holding
- Cooking
- Cold Holding (check refrig. temps twice daily)
- Receiving/transportation
- Sanitization
FDA Foodborne Illness Risk Factors

- Certified Manager Had a Positive Effect on:
  - Poor Personal Hygiene
  - Contaminated Equipment
  - Holding Temperatures

- Should be a certified manager at all times and worker training
Finding the Cause of Foodborne Outbreaks

Production at the farm

- Is there contamination from manure or animals?
- Is the water used for irrigation and washing safe?
Finding the Cause of Foodborne Outbreaks

**Processing**
- Are foods cooked to temperatures to kill bacteria?
- Are ingredients that won’t be thoroughly cooked safe?
- Are foods protected from contamination?

**Transportation**
- Was refrigeration turned off to save fuel?
Finding the Root Cause of Foodborne Outbreaks

Restaurants and Markets

- Are foods cooked to safe temperatures?
- Are ready-to-eat ingredients safe?
- Was anyone ill preparing food?
- Are foods held (hot and cold) at safe temperatures?
- Are foods protected from contamination?
  - Was there bare hand contact of ready-to-eat foods such as salads?
Questions

How much variance in illness between states is due to reporting versus differences in illness?

- E.g. Mass. Salmonella and Shigella high due to better reporting or local sources?
- Vermont high E. coli O157:H7 and Campylobacter due to raw milk products?
- Are these products coming here?
Next Steps

- Listeria rates high in the region compared to U.S.
  - Do we have another regional source of illness?
  - Organism persists in food establishments
  - Sample high risk foods
    - Consumed by ill individuals
    - Implicated previously in outbreaks or recalls
Next Steps

- Target reducing Salmonellosis and Campylobacteriosis
  - Thorough cooking of all poultry and egg products
  - Evaluation of spices used on ready-to-eat foods
The Future

- New FDA Food Code in December
- Food Safety Modernization Act Implementation
  - National Integrated Food Safety System
- Compliance with national standards
- More use of technology and direct notification of consumers of recalls using loyalty cards
- Address food safety on the farms
- Nutrition and obesity
FDA Preventive Control Rule

- November 15 deadline for comments
- June 2015 court mandated final rule date
- Applies HACCP type requirements to foreign and domestic food processing firms
- Need written hazard control plans
FDA Preventive Control Rule

- Large businesses 1 year to comply after effective date
- “small businesses” 2 years
- “very small businesses” 3 years
  - Definition of sizes open for comment
FDA Produce Rule

- Safe Water
- Manure Use
- Processing
- Exemptions

- “Small” business sells annually no more than $500,000 in food
- “Very small” business sells annually no more than $250,000 in food
FDA Produce Rule

- “small businesses” three years to comply after effective date
- “very small businesses” four years after effective date
- Longer for some water-related requirements
Changes in Food Protection

- 4 deaths from zeppoles
- 7 to 17 inspectors and posting at least two more
Holiday Food Safety

To avoid illness due to Salmonella and Clostridium perfringens

- Cook stuffing separately recommended
- 165 degrees F minimum
- 9 hours to cool whole turkey
  - Debone
  - Don’t let sit at room temperature
  - Cool less than 4 inches thick
  - Refrigerate sandwiches for work and school
- No raw egg in eggnog
INFORM
November 20, 2013

Ernest Julian
Ph.D.

www.CIFOR.us
Food Code requires food only be purchased from an “Approved Source”

Legislature passed law requiring all food distributors and processors who sell in RI be registered and pay a $500 fee

- Assures that facility is licensed in their state
- Quickly ID food source in outbreaks & recalls