RIDOH Protects the People

- Restaurants
- Markets
- Food Processors
- Caterers
- Food Trucks
- Temporary Event Vendors
- Farmers Markets
- Dairy Farms
Know your Risks

- Risk factors linked to FBI
- Complexity of Menu
- Population Served
Risk Factors linked to FBI

- Personal Hygiene
- Approved Source
- Adequate Cooking
- Temperature Control
- Contamination
Poor Personal Hygiene

- Handwashing
- No Bare Hand Contact w/ Ready to Eat Food
- Employee Health
Approved Source

- No Homemade Foods Allowed
- Buy from Licensed Vendors
<table>
<thead>
<tr>
<th>Temperature (F)</th>
<th>Foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>165 F</td>
<td>Poultry</td>
</tr>
<tr>
<td></td>
<td>Stuffed TCS Foods</td>
</tr>
<tr>
<td></td>
<td>Dishes made from previously cooked foods</td>
</tr>
<tr>
<td>155 F</td>
<td>Ground animal foods</td>
</tr>
<tr>
<td></td>
<td>Injected, marinated, or tenderized meats</td>
</tr>
<tr>
<td></td>
<td>Eggs that will be hot-held for service</td>
</tr>
<tr>
<td>145 F</td>
<td>Whole seafood</td>
</tr>
<tr>
<td></td>
<td>Beef, pork, veal, lamb</td>
</tr>
<tr>
<td></td>
<td>Eggs that will be served immediately</td>
</tr>
<tr>
<td>135 F</td>
<td>Commercially processed, ready-to-eat food</td>
</tr>
<tr>
<td></td>
<td>that will be hot-held</td>
</tr>
<tr>
<td></td>
<td>Fruits, vegetables, grains, and legumes</td>
</tr>
<tr>
<td></td>
<td>that will be hot-held</td>
</tr>
</tbody>
</table>
Temperature Control

Bacterial Growth Curve

NUMBERS OF BACTERIA vs. LENGTH OF TIME
Contamination

Beef & Eggs Stored Over Uncovered Chowder
FBI Illness... Who is at risk?

Young

Pregnant Women

Sick People

Elderly
Risks Related to Processes

Complete Trips Through the Danger Zone

Danger Zone Diagram
# Inspection Data

**January – June 2015 for 4246 inspections**

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Violations</td>
<td>15453</td>
</tr>
<tr>
<td>Total Critical Violations</td>
<td>6589</td>
</tr>
<tr>
<td>Average # of violations per inspection</td>
<td>3.6</td>
</tr>
<tr>
<td>Average # of critical violations per inspection</td>
<td>1.6</td>
</tr>
<tr>
<td>Percent of inspections requiring reinspections</td>
<td>27%</td>
</tr>
<tr>
<td>Percent of inspections with disposals</td>
<td>17%</td>
</tr>
</tbody>
</table>
Common Critical violations

- Food-contact surfaces: cleaned & sanitized......1445
- Adequate handwashing facilities......................1218
- Proper cold holding temperatures ..................667
- Food separated & protected..........................544
- Proper date marking & disposition..................575
- Certified manager as required .....................504
Food Safety Regulations

- Food Safety regulations are not arbitrary, but rooted in science and prevention
- Food Safety regulations protect everyone
State Regulations

- Written to Reduce Risk Factors
- Rhode Island Food Code (R23-1, 21-27-Food)
- Rules and Regulations Pertaining to Certification of Managers in Food Safety (R21-27-CFS)
Active Managerial Control

- Risks have been identified
- Hazards under Control
- Systems in place
- Preventative rather than reactive!
- Leads to long term Compliance
New RI Food code coming soon

- Terminology Change: Time Temperature Control for Safety (TCS)
- Addition of cut leafy greens & cut tomatoes to TCS
- Clean up procedures for vomiting etc.
- Changes with Vacuum Packing
Food Safety Modernization Act

Prevention
Enhanced Partnerships
Increased Inspections
Enhanced Response
Import Safety
Apply Domestic Standards to Imported Foods
FSMA Rules

- Preventive Controls for Human Food
- Preventive Controls Food for Animals
- Produce Safety
FSMA Rules

Foreign Supplier Verification for Imports

Accreditation & Certification of 3rd Party Auditors

Focused Mitigation Strategies to Protect Against Intentional Adulteration

Sanitary Transportation
Preventive controls

Analyze Hazards

Identify Controls and Steps to Minimize the Hazard

Implement Monitoring

Keep Records

Identify Corrective Actions
Produce safety

- Soil and Manure
- Hygiene
- Animal Control
- Temperature Control
- Packaging
Purchasing Produce

- Salmonella, STEC, Cyclospora, Listeria Concerns
  - Mexico
  - Delmarva outbreaks from tomatoes and likely other produce since 2002
- Need Preventive Controls and testing
- Irrigation and wash water for ready-to-eat produce must be safe
- Manure use on fields a concern
USDA FSIS Update

- Labelling of tenderized steaks
- 90% steaks are pinned
- Grinding logs for control & traceback of E. coli
Shellfish

▶ Vibrio

▶ Warmer water temperatures = more illness in summer from eating shellfish
Idaho Health Officials Link Eight Foodborne Illnesses to Raw Milk Dairy

By News Desk | October 21, 2015

E Coli, Salmonella, Camplobacter associated with unpasteurized milk
Top Foodborne Pathogens

- Norovirus: 58%
- Salmonella: 11%
- Perfringens: 10%
- Campylobacter: 9%
- Staphlococcus: 3%

Norovirus accounts for 91% of total foodborne illness.
Illness versus Death

Top pathogens contributing to domestically acquired foodborne illnesses and deaths, 2000–2008

- Norovirus
- Salmonella, nontyphoidal
- Clostridium perfringens
- Campylobacter spp.
- Staphylococcus aureus
- Toxoplasma gondii
- Listeria monocytogenes

Source: CDC
Illness versus Death, by Foods

Figure 1. Contribution of different food categories to estimated domestically-acquired illnesses and deaths, 1998-2008*

*Chart does not show 5% of illnesses and 2% of deaths attributed to other commodities. In addition, 1% of illnesses and 25% of deaths were not attributed to commodities; these were caused by pathogens not in the outbreak database, mainly Toxoplasmosis and Vibrio vulnificus.

Source: Painter et al. 2013
## 2014 Food Safety Progress Report

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Healthy People 2020 target rate</th>
<th>2014 rate</th>
<th>Change compared with 2006-2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campylobacter</td>
<td>8.5</td>
<td>13.45</td>
<td>13% increase</td>
</tr>
<tr>
<td>E. coli O157&lt;sup&gt;1&lt;/sup&gt;</td>
<td>0.6</td>
<td>0.92</td>
<td>32% decrease</td>
</tr>
<tr>
<td>Listeria</td>
<td>0.2</td>
<td>0.24</td>
<td>No change</td>
</tr>
<tr>
<td>Salmonella</td>
<td>11.4</td>
<td>15.45</td>
<td>No change</td>
</tr>
<tr>
<td>Vibrio</td>
<td>0.2</td>
<td>0.45</td>
<td>52% increase</td>
</tr>
<tr>
<td>Yersinia</td>
<td>0.3</td>
<td>0.28</td>
<td>22% decrease</td>
</tr>
</tbody>
</table>

*Culture-confirmed infections per 100,000 population

<sup>1</sup> 2006-2008 were the baseline years used to establish Healthy People 2020 targets

<sup>2</sup> Shiga toxin-producing Escherichia coli O157
Listeria Investigation

- 10 Lm cases in RI in 2014
- In recent years, 2-6 cases/year
- 4 cases clustered by time and location
- Epi, exposure interviews, environmental investigations, and lab testing used to identify likely source
Listeria

- Incubation period 3 to 70 days
- Typically 3 to 4 weeks between eating and illness
- Persists in the environment
- Recurring outbreaks from same sources
- Grows at refrigerator temperatures
- Sampled high risk foods - shopper cards
  - Luncheon meat sliced at deli, soft cheeses, seafood, salads...
Cases

- **Case 1**
  - Date: 10/23/14
  - Location: Store 1, Rest. A, Rest. B
  - Duration: 6 days

- **Case 2**
  - Date: 10/29/14
  - Location: Store 1, Rest. A, Rest. B
  - Duration: 2 days

- **Case 3**
  - Date: 10/31/14
  - Location: Rest. A, Rest. B
  - Duration: 12 days

- **Case 4**
  - Date: 11/12/14
  - Location: Store 1
  - Duration: 1 day
Environmental Visits

- Date of first visit: 10/29/14
- Samples taken: Deli meat, cheeses, franks, swabs (15 total)
- Positive tests: Swab of deli case seam
Environmental Visits

- Date of first visit: 11/7/14
- Samples: Swabs, prosciutto (opened and un-opened) (28 total)
- Positive tests: sliced prosciutto
3 Cases Matched Restaurant A and a Case from a Year Prior

Case a year prior did not remember eating at Restaurant A when initially interviewed
Listeria found in 5 of 7 establishments

- 5 positive samples
  - Sliced prosciutto, stuffed clam, raw clams, deli case swab
  - Prepared green salad from fridge of Case 3

All other samples negative (evaluation of possible sources)

- Slicer swabs, deli meats, un-opened prosciutto from Rest. A
- USDA – no matching meat samples from plant

PFGE and WGS needed to make sense of findings, and solved case from a year prior

Additional illness and deaths likely if had not found source
Summary of Follow-up

- Store 1 → Ensured cleanability of deli cases; additional swabbing
- Restaurant B → Replaced wooden case; ensured sanitation at seafood processor
- Restaurant B/C → Changed stuffie preparation; removed plastic grass
- Seafood processing plant closed - did not correct hazards
- Restaurant A → Elimination of Lm; replaced equipment
Summary of Follow-up

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Outbreak Conclusions

- Outbreak associated with Rest. A
- All 3 cases from 2014 and 2013 case (only known shared exposure)
- Clinical samples and sliced prosciutto from Rest. A closely related (PFGE + WGS)
- Persistent environmental contamination supported
- WGS critical in finding source and linking the establishment to a case in the previous year
PFGE versus Whole Genome Sequencing

- WGS more accurate than PFGE
- Freeze isolates and regrow them
- FDA Genome Trakr
Foodhandlers Perceptions

- Do Food Think Food Employees Think They Have High Risk Jobs?

- Food workers view their business as low risk (Clayton et al, 2002)
How do Food Workers Learn?

- Oral (like demonstrations & pictures) versus Print Culture (like reading documents)

- Research shows that real-life examples get food workers and managers’ attention and help them learn (Beagle, 2004)
Getting Compliance

- Food handlers want to know WHY?
- Oral Culture Project

http://www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/IndustryandRegulatoryAssistanceandTrainingResources/ucm212661.htm
New Study: Food Handlers Work Sick

- 51% — "always" or "frequently" sick
- Another 38 percent said they go to work sick "sometimes."

Why?
- No paid sick leave
- Did not want to burden coworkers
Strategies to Effect Change

- Clear policies for employees to report illness & symptoms
- Paid sick leave
- On-call workers and flexible scheduling
Message to Industry

- Focus on Food Safety Culture
- Practice Active Managerial Control
- Understand your Risks
  - Internally
  - Suppliers
- Monitor changing Landscape
- Know your Regulations
Recommendations

- Develop SOPs to Control Risk Factors
- Provide Training to Employees
- Establish critical limits
- Correct Deviations Immediately
- Assess if SOPS are Working
Challenges

- "Healthy" Foods?
  - Tomatoes
  - Cucumbers
  - Spices
  - Cilantro
  - Melons
  - Bean sprouts
Challenges