Massachusetts Department of Public Health

An Outbreak of *Salmonella* Enteritidis Associated with a Farm-to-Table Restaurant Chain, 2024

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Overview

- Enteric Outbreak Detection and Response in MA
- Outbreak of *Salmonella* Enteritidis Associated with Restaurant A
  - Epidemiology
  - Environmental Assessment
  - Preventative Actions
- The LBOH Perspective
- Q&A

Learning Objectives

- **Understand the detection and investigation of *Salmonella* outbreaks in Massachusetts**
- **Describe the importance of environmental assessments during outbreak investigations**
- **Identify three ways to assure the safety of eggs in restaurants**

Salmonella Outbreak Detection

What Is Non-Typhoidal Salmonellosis?

Incubation Period: generally, 6-48 hours, but can be a week or more.

Symptoms:

- Diarrhea
- Fever
- Abdominal cramps

Illness Duration: 4-7 days

Transmission: Bacteria must be ingested to cause disease

Salmonellosis results in the most hospitalizations of all foodborne illnesses, with an estimated 27% of individuals requiring hospitalization.

Possible *Salmonella* Exposures

Meat

(chicken, turkey, beef, pork)

Eggs

Unpasteurized/Raw Dairy

Produce

(sprouts, onions, tomatoes, herbs, pre-cut fruit)

Processed Foods

(peanut butter, frozen meals, flour, charcuterie meats)

Animal Contact

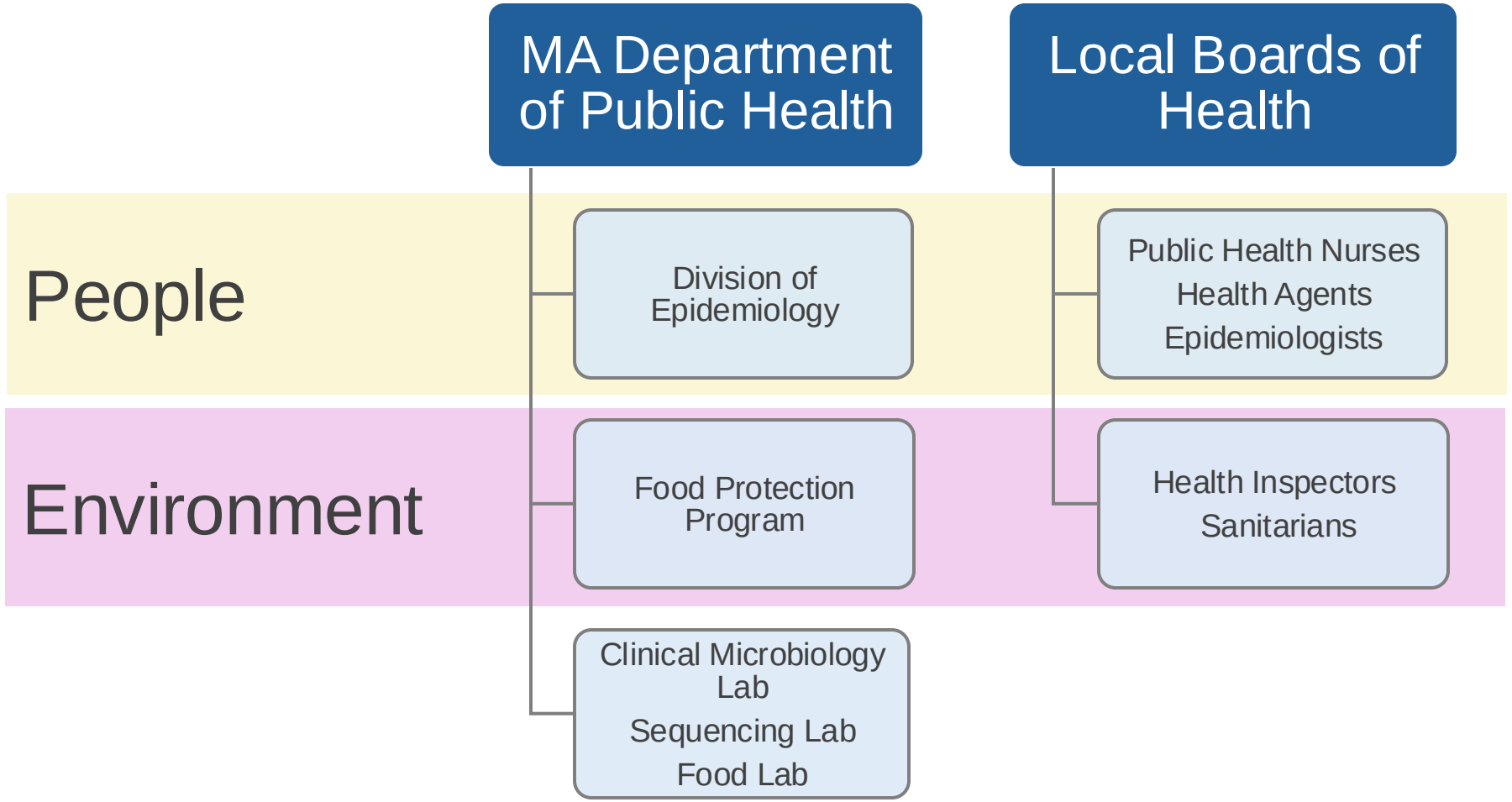
(backyard poultry, bearded dragons, turtles)

Contact with Pet Food

What is an Outbreak?

When ≥2 people (from different households) have the same illness after a **shared exposure**

Who Is Involved?



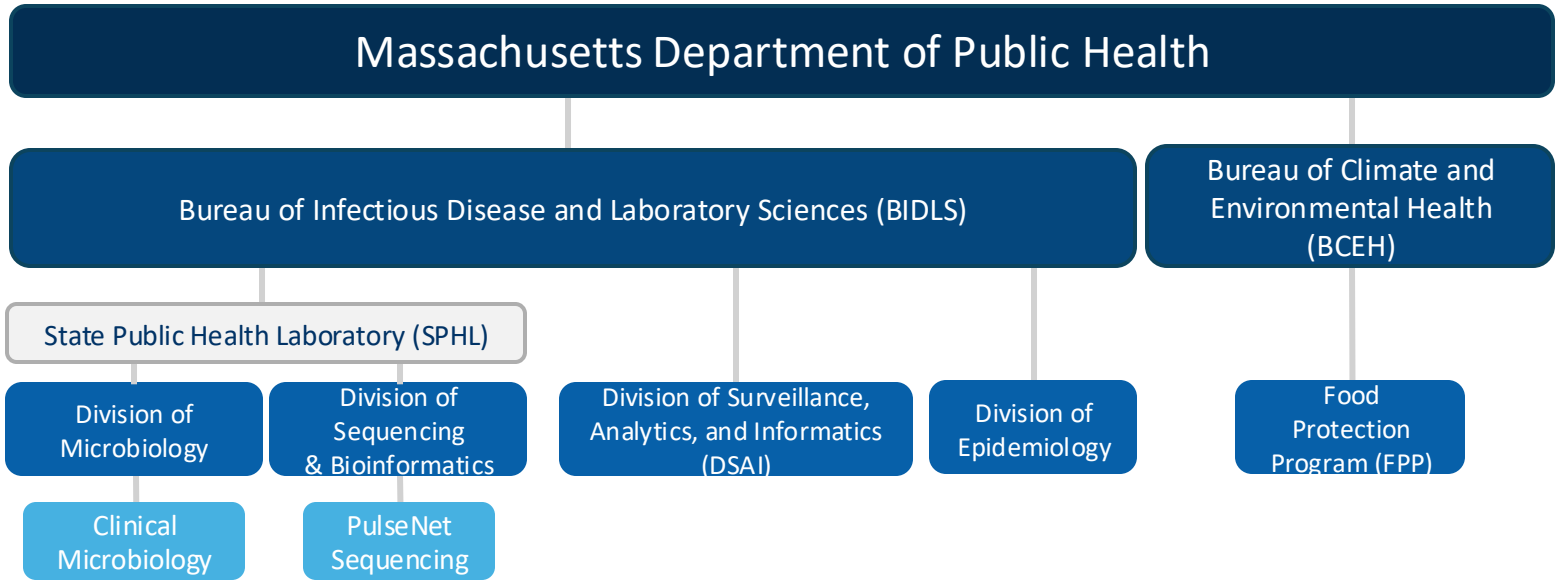
MA Department of Agricultural Resources

DPH Community Sanitation

CDC/FDA/USDA

Working Group on Foodborne Illness Control

Mission Statement: The Working Group on Foodborne Illness Control (WGFIC), established in 1986, is a collaboration of the Food Protection Program (FPP), Division of Epidemiology (Epi), the Division of Microbiology laboratories (Lab), and the Division of Sequencing and Bioinformatics Core (DSBC) at the Massachusetts Department of Public Health (DPH). The group's mission is to identify and prevent foodborne illness through information exchange both within DPH and among local partners, develop best practices in foodborne outbreak investigations, and share knowledge through presentations, educational materials and reports.



How Are *Salmonella* Outbreaks Detected?

Routine Case Investigations	• LBOHs identify shared exposures during case interviews • Epis manually reviews cases
Whole Genome Sequencing (WGS)	• DNA fingerprints of *Salmonella* isolates from cases are compared to one another to identify those that are closely related within MA and the US • Determines *Salmonella* serotypes
Verbal Report	• Health care providers, hospitals, institutions, schools, daycares, camps, and members of the public notify LBOHs and/or DPH
Routine Data Analysis	• Epis run a series of reports to detect shared exposures • FPP reviews Foodborne Illness Complaints

The Outbreak

Timeline

12/26/23

Routine *Salmonella* case investigation by LBOH identifies exposure at Restaurant A, Location 1

12/27/23

LBOH conducts routine inspection at Restaurant A, Location 1

1/11/24

SPHL detects 4 *Salmonella* Enteritidis isolates genetically related by WGS

1/16/24

LBOHs and Epis re-interview cases. All 4 cases report exposure at Restaurant A Location 1 and Location 2

Outbreak investigation!

Restaurant A

- Farm-to-table-style restaurant with dine-in, takeout, and delivery options available
- Two locations (one-hour drive apart)
- All ingredients and food items are locally sourced
- Primarily serves breakfast, brunch, and lunch

Microsoft Stock Image

Throughout the Investigation

- Continued case finding
  - Genetically related cases matched by WGS
  - Routine investigations
  - SaTScan analysis
- Re-interview cases and obtain meal details, if needed
- Develop case definition(s)
- Environmental assessments by LBOH
- COMMUNICATION

Epidemiologic Summary

20 ill patrons
Exposed to Restaurant A, Locations 1 & 2

17 lab-confirmed *Salmonella* Enteritidis cases, genetically related by WGS

+

3 probable cases, not lab-confirmed

Epidemiologic Summary

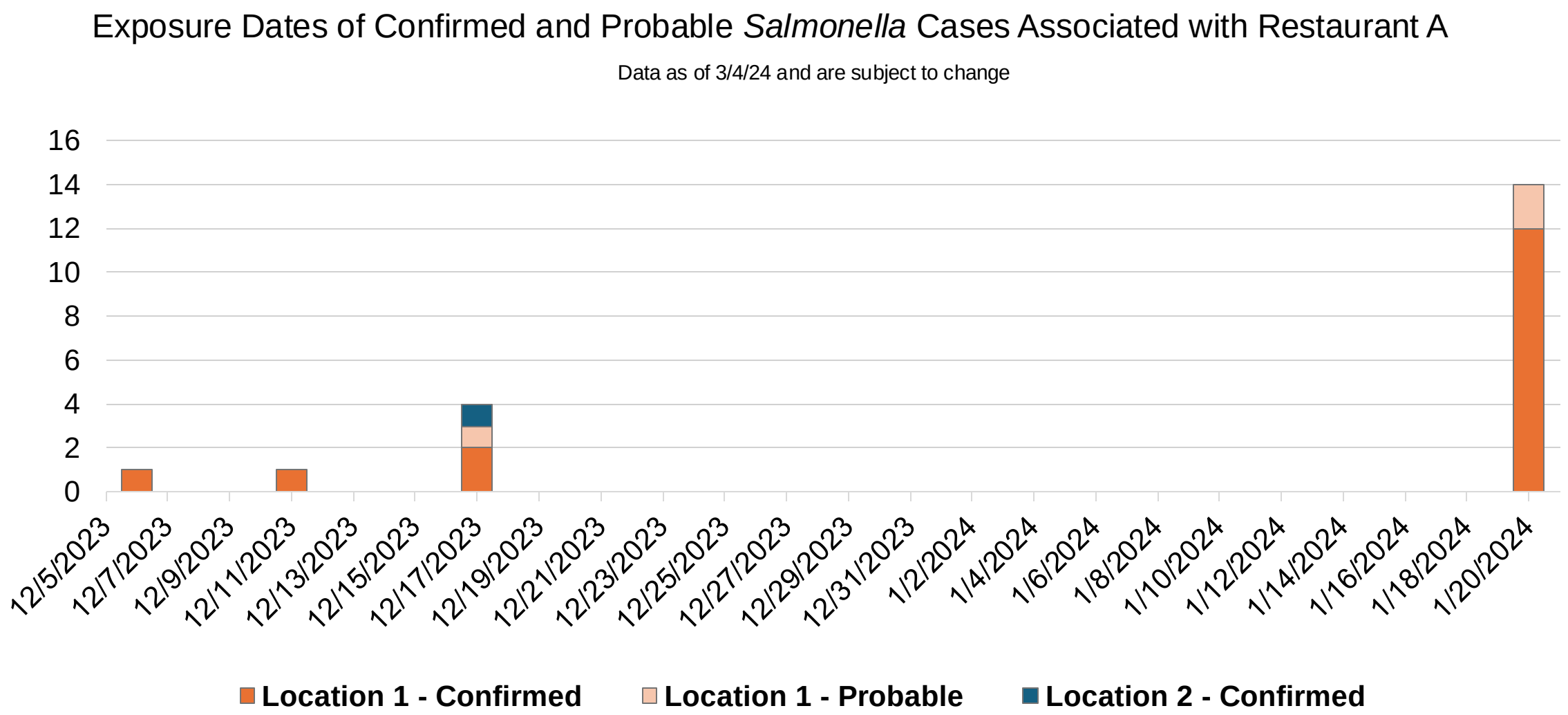
Age range: 7 to 83 years (median=32 years)

Gender: 65% were female

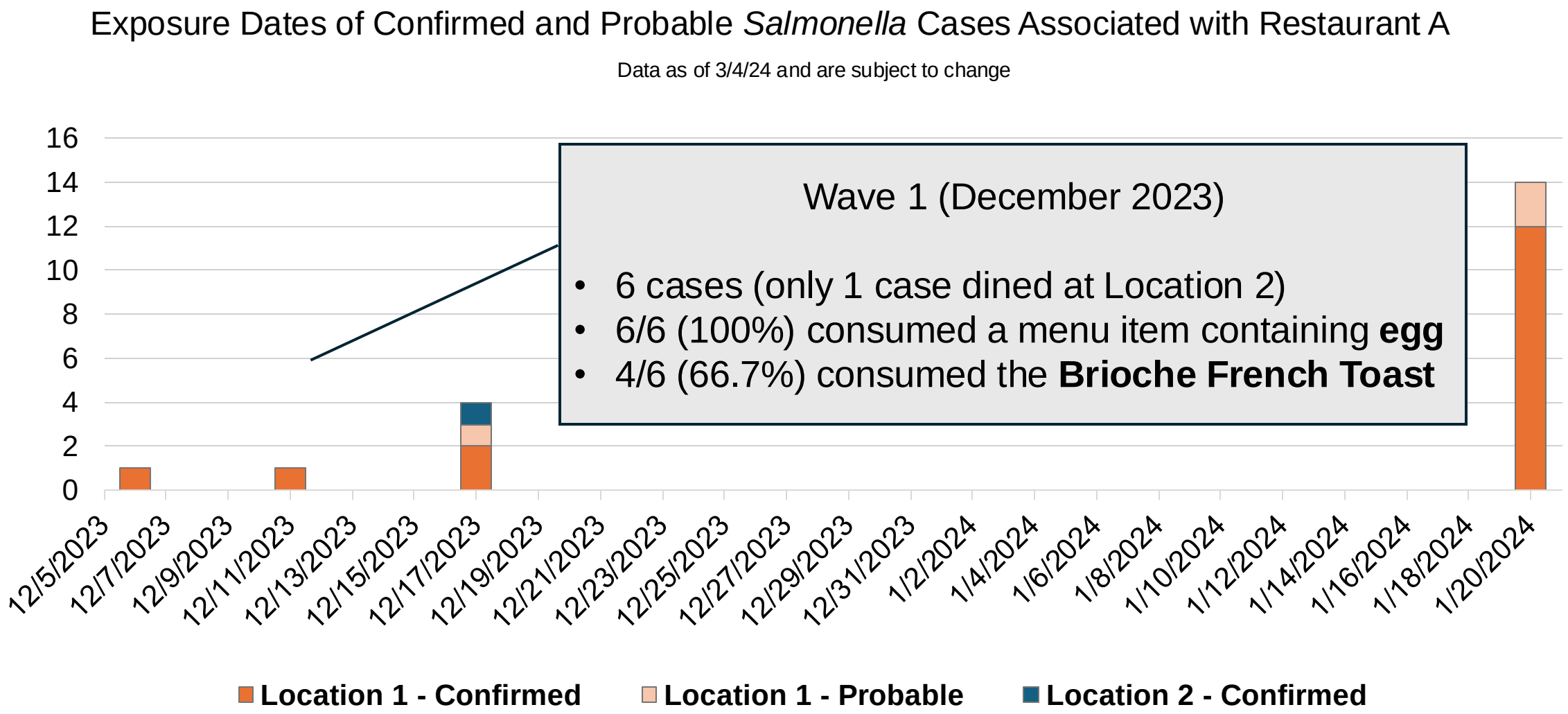
Symptom onset range: 12/6/2023 to 1/26/2024

Incubation period range: 0 to 6 days

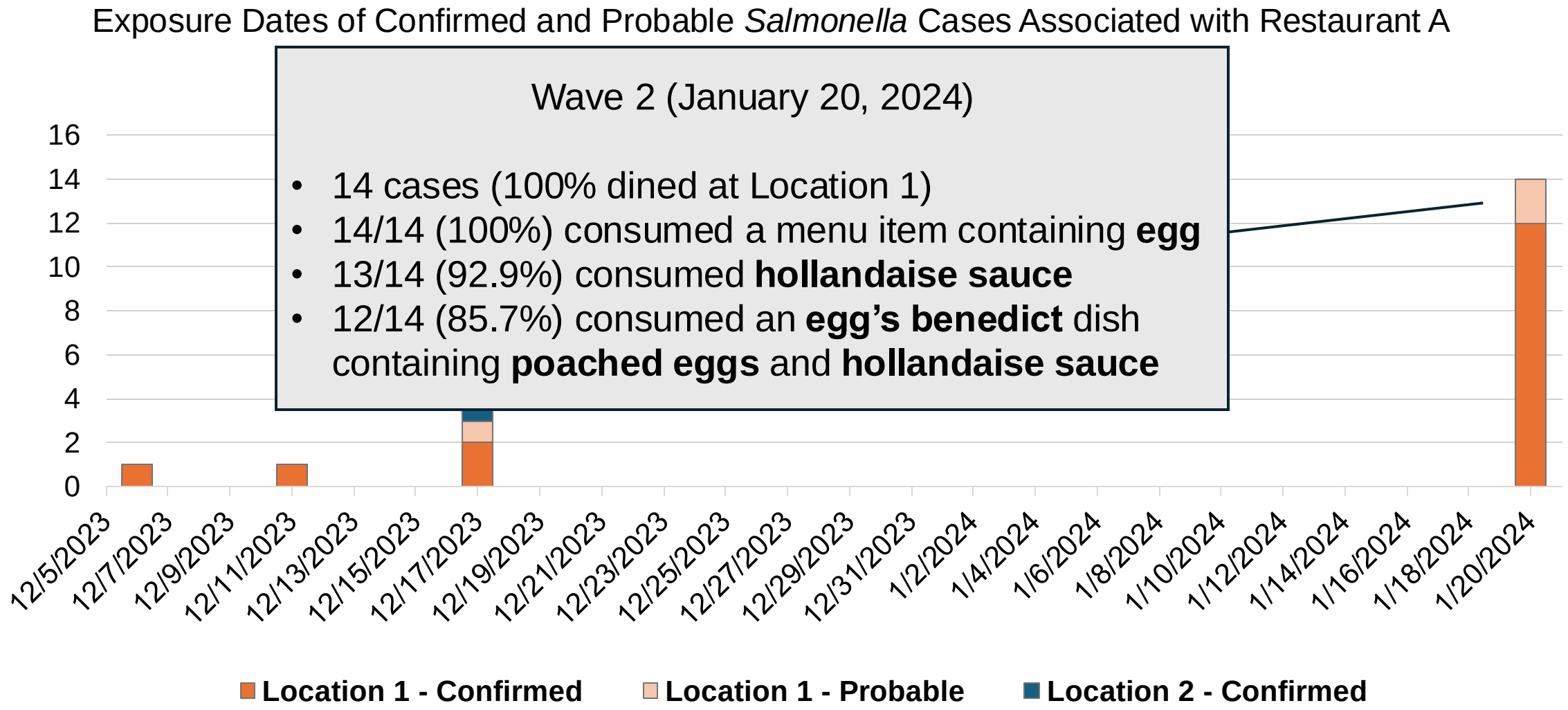
Epidemiologic Summary



Epidemiologic Summary



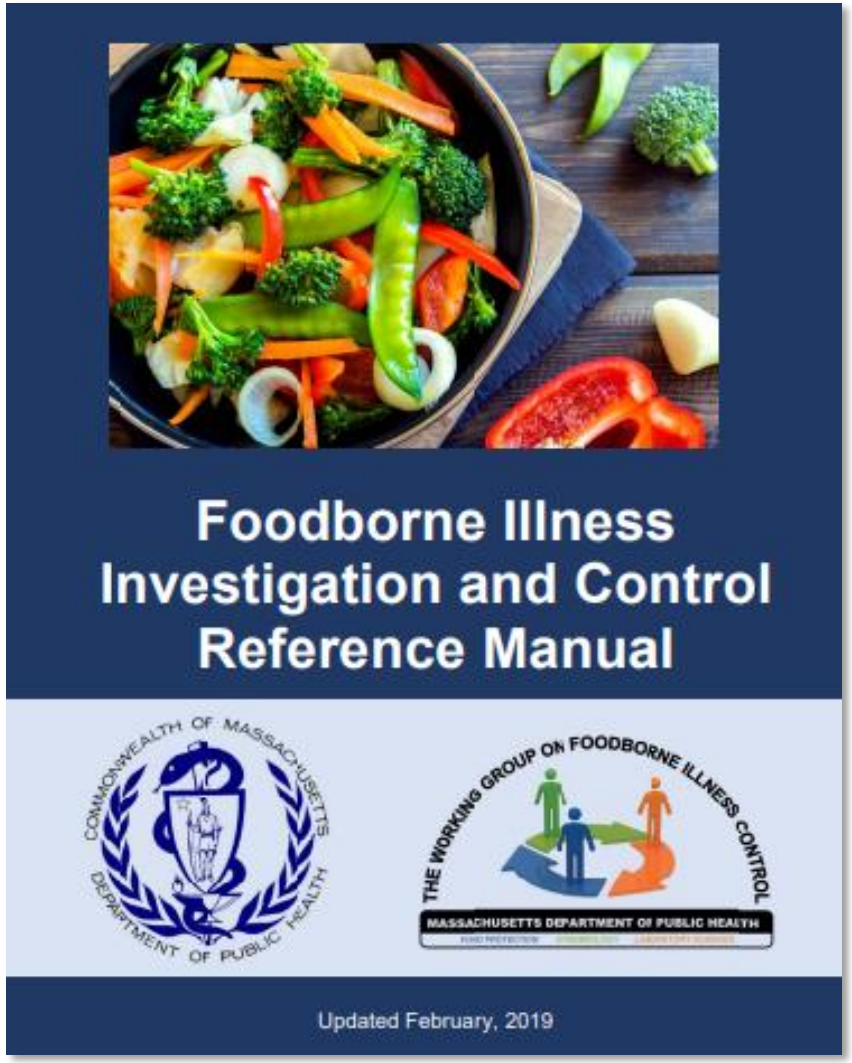
Epidemiologic Summary



The Common Denominator?

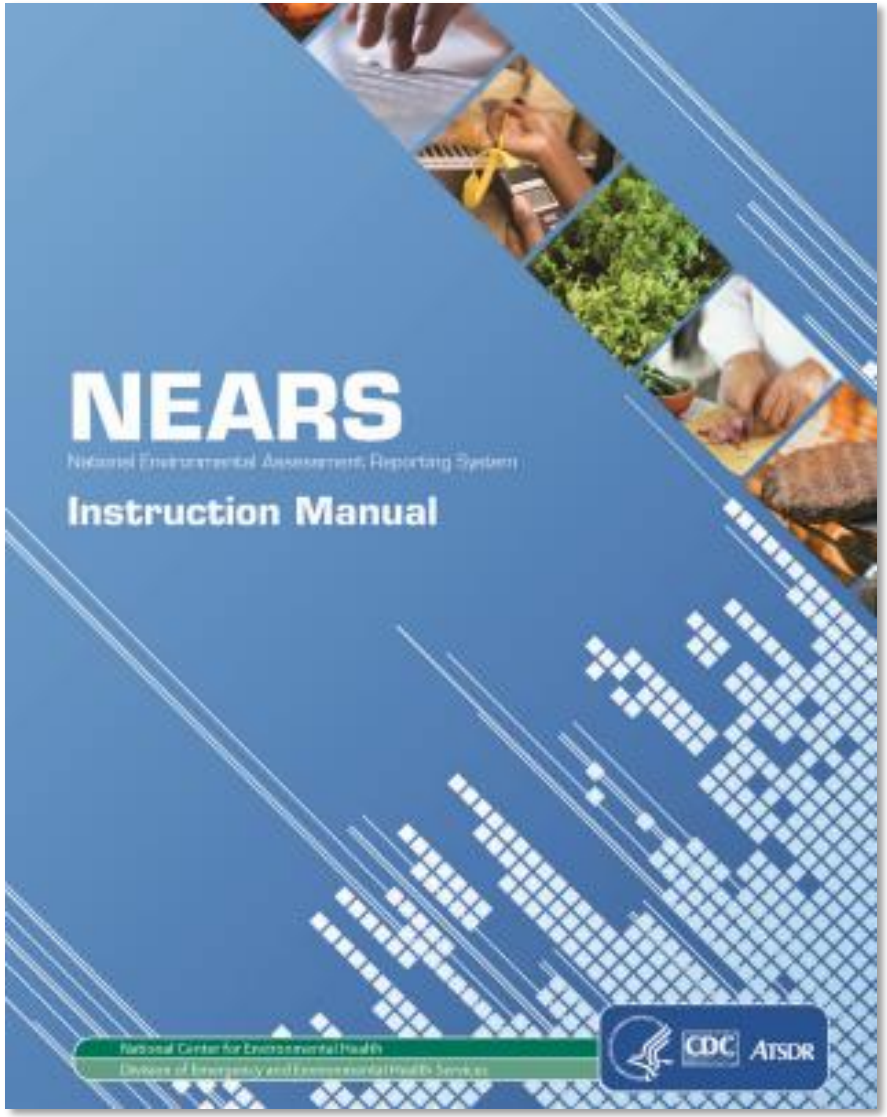
Environmental Assessment

Foodborne Illness Investigation and Control Reference Manual

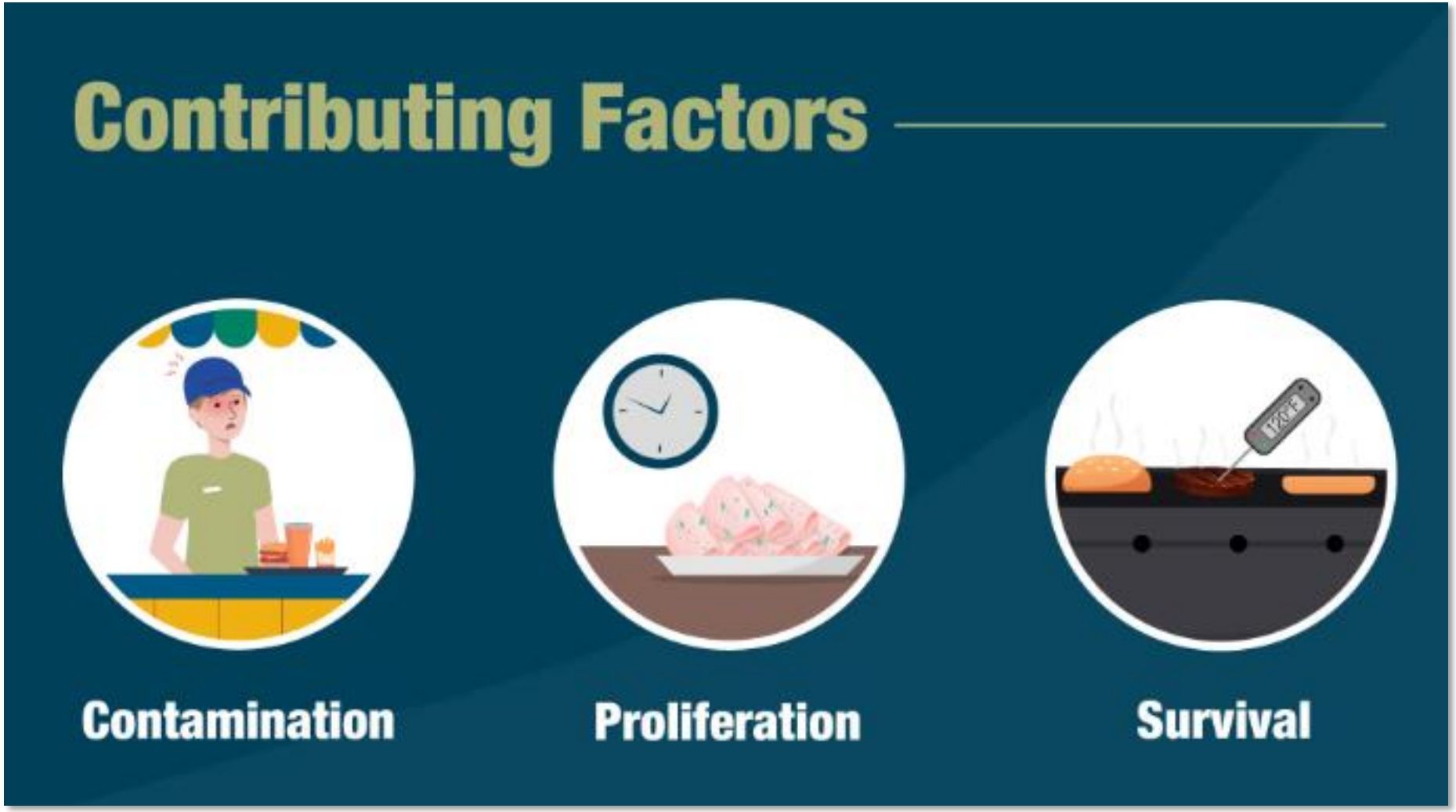


mass.gov/lists/foodborne-illness-investigation-and-control-manual

National Environmental Assessment Reporting System (NEARS)



Contributing Factors



Source: cdc.gov/restaurant-food-safety/php/investigations/factors.html

Initial inspection 12/27/23 – Location 1

- Location 1 was advised by the local health department to dispose of all eggs on site to mitigate any risk to future customers.

Inspection 2 and NEARS Data Collection 1/18/24

5 Cases

What did we learn?

- No violations were reported on the inspection report
- Egg vendor was identified (supplied both locations)
- NEARS data identified that temperatures of foods were not being taken
  - Opportunity for pathogen survival
- We needed more information

Initial inspection 1/25/24 – Location 2

1 Case

What did we learn?

- 3 violations were reported on the inspection report
  - Hollandaise being held at 101F
  - Eggs were 60F in prep flip top
  - Date marking issue
- No staff shared between locations
- No food prepared and shared across sites

HACCP Risk Assessment of Brioche French Toast

- Pooling of eggs
  - Opportunity for proliferation
- Jewelry (wristwatch) worn while hand mixing brioche mixture
  - Opportunity for contamination

HACCP Risk Assessment of Brioche French Toast

- Cooking process
  - Opportunity for survival
- Cooling process
  - Opportunity for proliferation (if not cooked fully)

Hollandaise Sauce

- Made with **unpasteurized** eggs
  - Opportunity for survival
- Not heated to a high enough temperature to kill bacteria like *Salmonella*
- Held for service in a steam table at 120F

Substitute pasteurized eggs or egg products for raw shell eggs in preparing such foods as Caesar salad, hollandaise or béarnaise sauce, mayonnaise, eggnog, ice cream, and egg-fortified beverages that are not thoroughly cooked. (See minimum cooking times and temperatures on opposite page.)

- Cook raw shell eggs that are broken for immediate preparation and service to heat all parts of the food to a temperature of 63°C (145°F) or above for 15 seconds.

https://www.fda.gov/media/77724/download

Changes Made by Restaurant A

- On 1/26/24, LBOH had the restaurant discontinue the use of eggs from usual local supplier to pasteurized eggs for all products
  - Initially switched to pasture-raised eggs due to confusion with abbreviations on the supplier's order form. Corrected on 2/6/24
    - "PSTRZD" for pasteurized
    - "PSTRSD" for pasture-raised

Source: https://theunmanlychef.com/2015/02/26/safest-choice-eggs/

Changes Made by Restaurant A

- Restaurant was provided instant-read thermometers, an infrared thermometer, and a HACCP logbook
  - Final temperature of Brioche French Toast to be taken after every batch
- Staff was trained how to calibrate and properly use thermometers, and use of the logbooks for multiple food processes
- Staff trained in proper handling of eggs before resuming use of unpasteurized eggs

Local Egg Supplier

- **Exempt** from FDA's Egg Safety Rule due to flock size

- FDA: **"**The rule requires that measures designed to prevent *Salmonella* Enteritidis be adopted by virtually all egg producers with 3,000 or more laying hens whose shell eggs are not processed with a treatment, such as pasteurization, to ensure their safety."

Local Egg Supplier

- Farm conducted their own testing at a private laboratory voluntarily
- Samples tested negative for *Salmonella*
  - Eight egg samples collected on 1/29/24
  - Four environmental samples collected 2/6/24 from each of the farm's four coops
- Farmer's retail and restaurant customer list was collected for monitoring of additional cases at any of those locations
  - No additional cases were identified
- Restaurant A was their largest customer

Environmental Wrap Up – Assuring the Safety of Eggs

- As a general rule, pasteurized eggs should be used in recipes that call for egg pooling and for any recipe that involves holding eggs or egg-containing foods before or after cooking.
- Substitute pasteurized eggs for raw shell eggs in preparing foods such as hollandaise or other products that are not thoroughly cooked.
- Understand and feel confident in the egg products being bought whether that be confirming product codes with suppliers or visiting your local egg supplier to understand farm operations.

The LBOH Perspective

Conclusion

- There are a variety of methods used to detect outbreaks of *Salmonella* in MA.
- An outbreak of *Salmonella* Enteritidis associated with a local farm-to-table restaurant chain was likely due to egg handling practices at the restaurant.
  - Food exposure data (pooled eggs and hollandaise sauce)
  - Environmental assessments at restaurant
- The local health departments' collaborative work with the restaurant owner improved the chain's food safety practices and ensured a continued relationship with the local farm.

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