



FSIS Foodborne Illness Investigations: Current Thinking

Scott A. Seys, MPH

Chief, Foodborne Disease Investigations Branch

Office of Public Health Science

Food Safety and Inspection Service

FSIS Investigations

- Multifaceted, multidisciplinary undertaking
- “Three-Legged Stool” of Investigations
 - Environmental Health
 - Epidemiology
 - Laboratory





FSIS Investigation Objectives

- Determine whether human illnesses are associated with FSIS-regulated products
- Identify source of production, distribution
- Gather information to guide response
- Take appropriate action to prevent further exposure to consumers



FSIS Investigation Objectives

- Initiate enforcement action as appropriate
- Identify contributing factors
- Report on results of investigation
- Recommend steps to prevent future occurrences

Epidemiology





Office of Public Health Science

- Responsible for providing scientific data, analysis, expert recommendations on public health and scientific concerns
- 4 divisions and 3 field laboratories
- FSIS interface with Centers for Disease Control and Prevention (CDC) and other public health partners

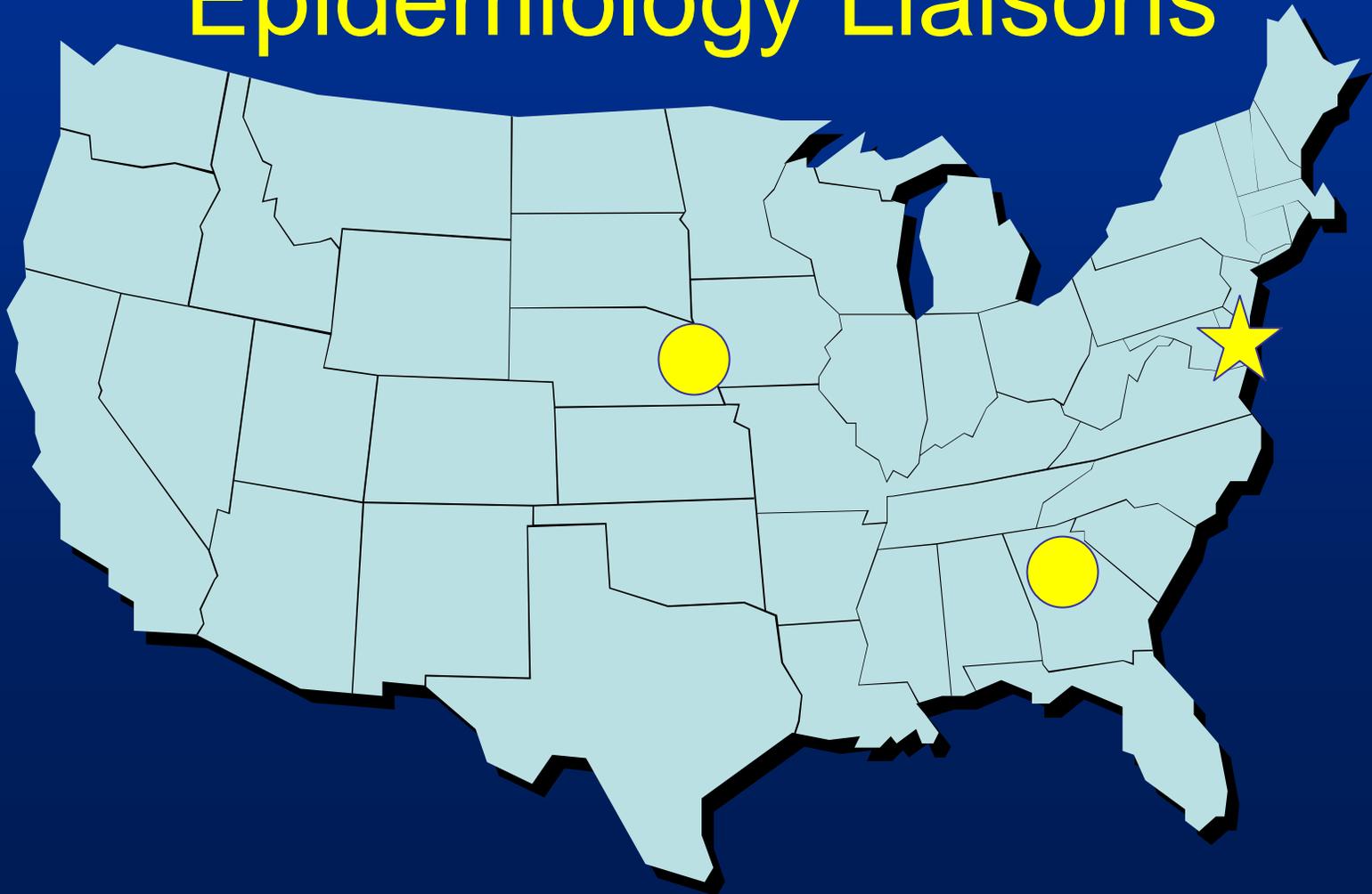


Foodborne Disease Investigations Branch

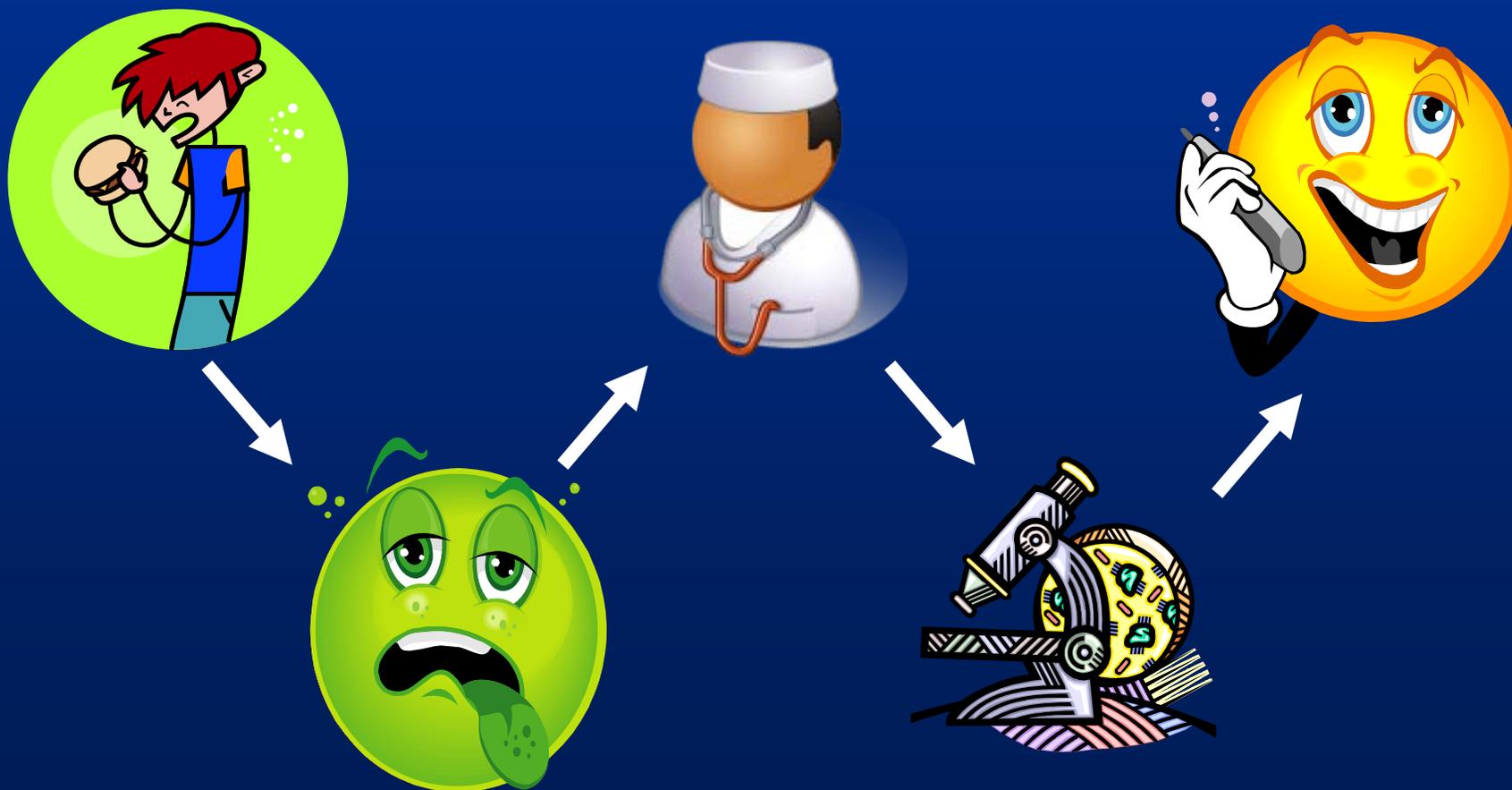
- Coordinate FSIS foodborne illness investigations
- Collaborate with public health partners to investigate illnesses potentially associated with FSIS-regulated product
- Serve as liaison between public health partners and FSIS specialty personnel



Public Health and Epidemiology Liaisons



Reporting of Foodborne Illnesses





Public Health Partner Activities

- Requirements for medical providers and laboratories to report certain illnesses
- Health departments investigate illnesses and suspected outbreaks
- If meat, poultry, egg products are suspected, FSIS becomes involved



FSIS Surveillance and Information Monitoring

- Local, state, territorial public health
- CDC via FSIS Liaison to CDC
- Other federal agencies (FDA, NPS, etc.)
- Internal foodborne illness and hazards surveillance
 - Consumer complaints, PFGE clusters
- Media reports



Assessment of Preliminary Data

- Does available information suggest a link between product and illness?
- Are methods scientifically valid?
- Are preliminary findings plausible?
- Do preliminary epidemiologic, laboratory, and environmental findings correlate?
- Do literature and past experiences support preliminary findings?

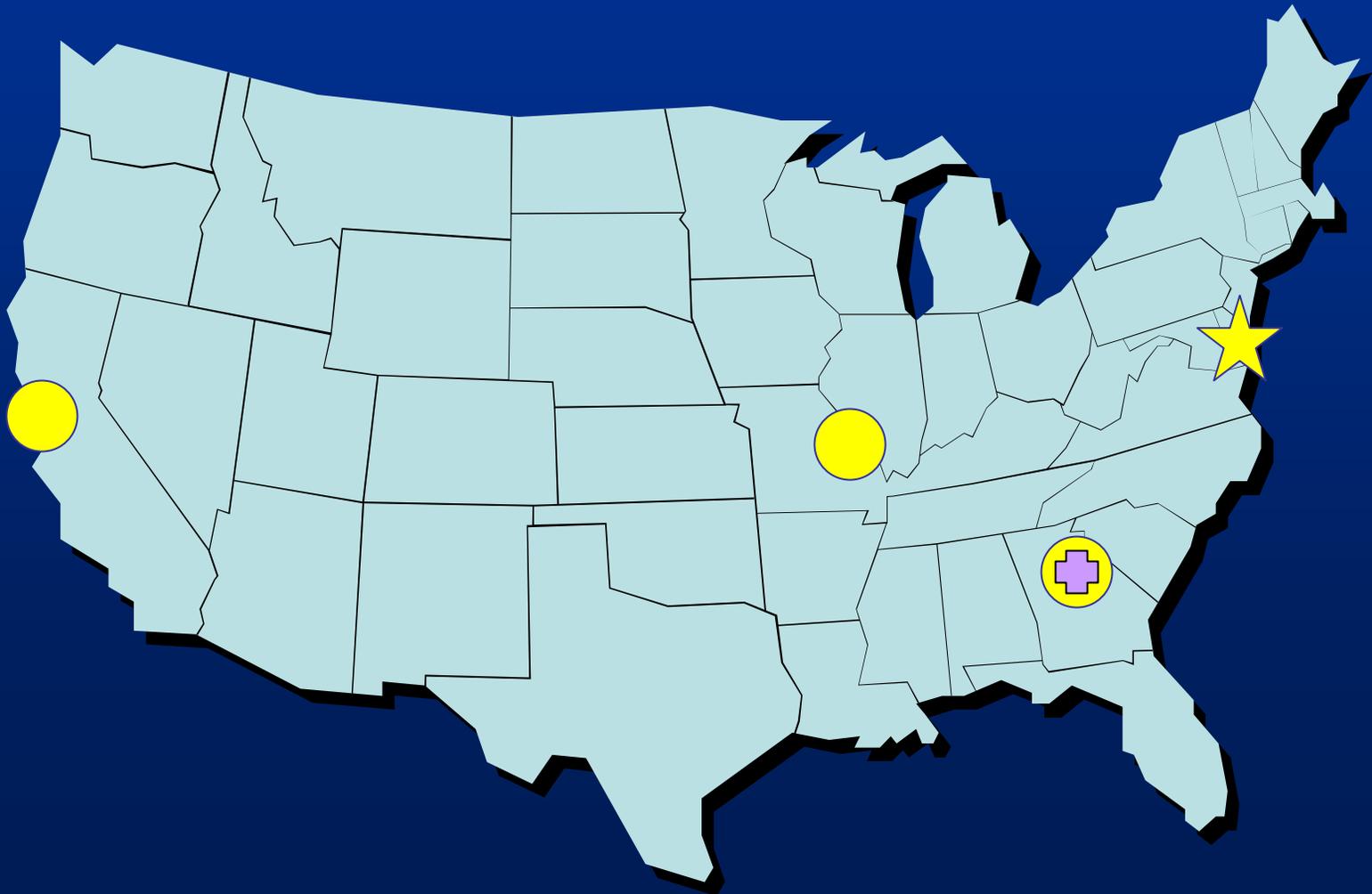


Laboratory





FSIS Laboratories



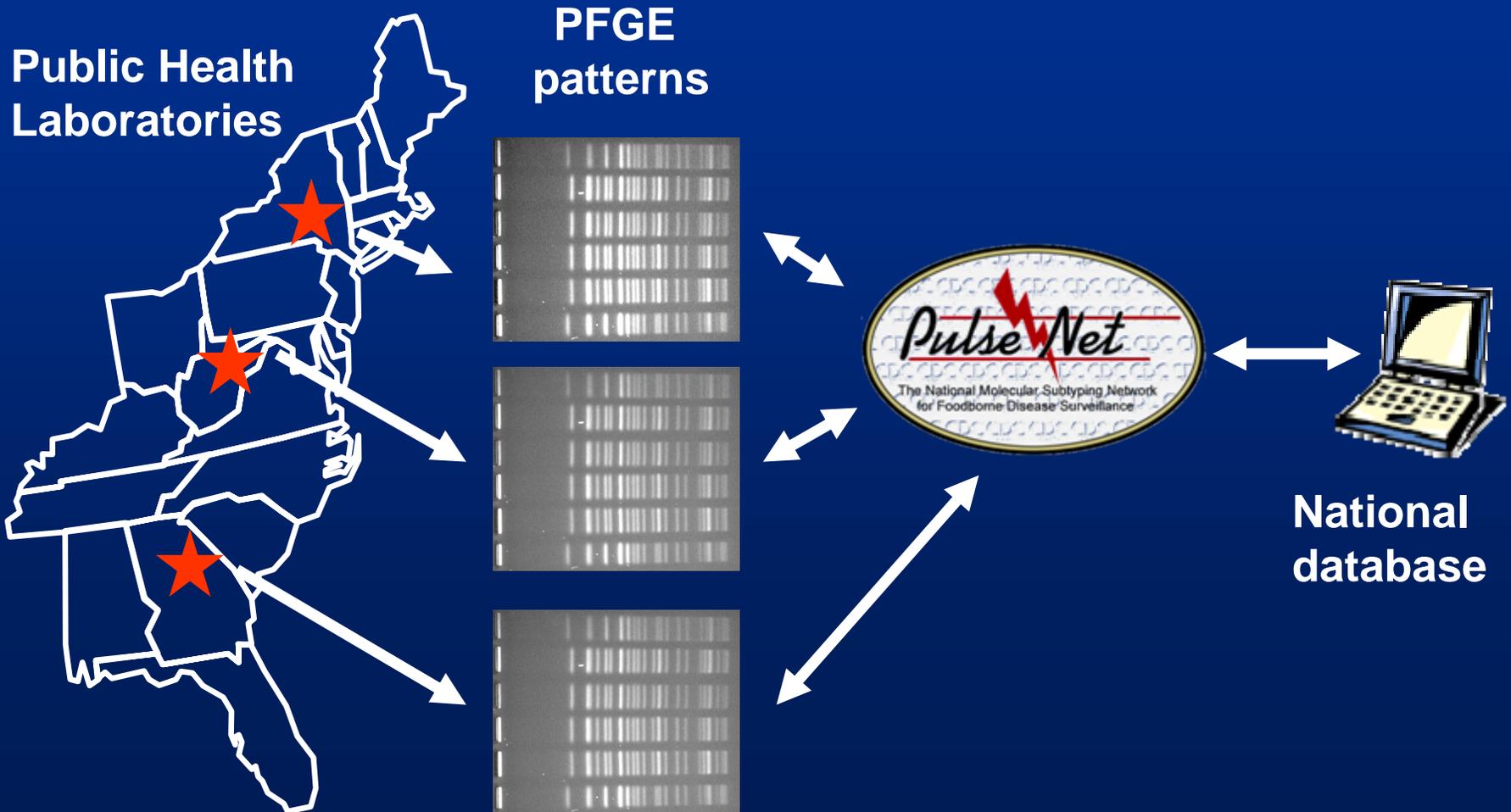


Product Sampling Assessment

- Do available data support a link between product and illness?
- Is product available meeting FSIS criteria for product identity, chain of custody, product handling?
- Has a non-FSIS laboratory tested product?
- Can testing be performed by, or in association with, FSIS?



Pulsed-Field Gel Electrophoresis (PFGE)





Role of PulseNet

- Detects clusters of illness with matching DNA “fingerprints”
 - Match suggests infections might have common origin
- Early identification of outbreaks
 - Persons with the outbreak “fingerprint” are likely to be part of the outbreak
 - Match between an isolate in suspect food and case-patient can help investigation



FSIS Use of PFGE

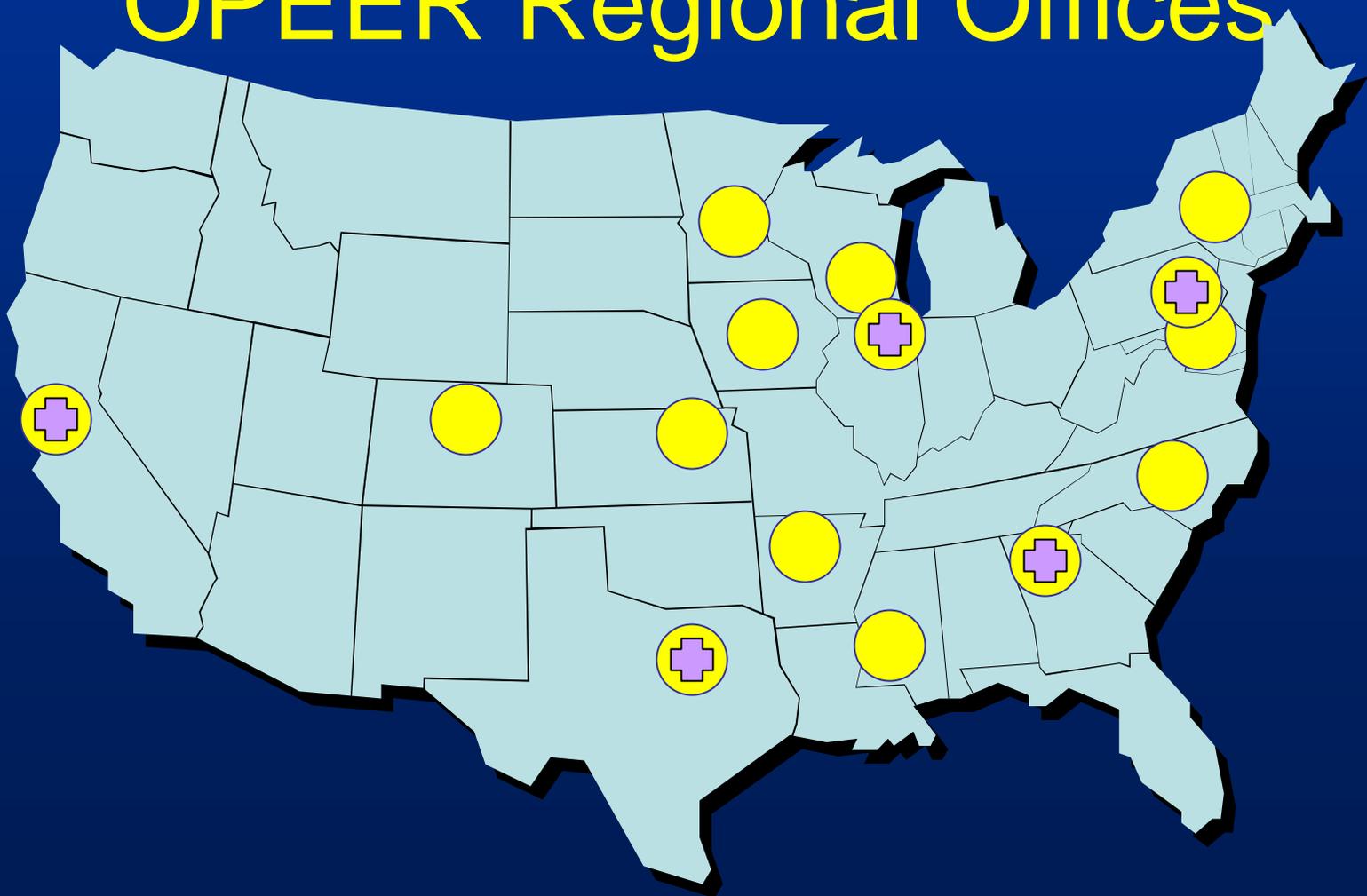
- All PFGE patterns derived from FSIS foodborne illness investigations and recall isolates uploaded to PulseNet
 - Recall watch to ensure adequate scope
- PFGE from FSIS *E. coli* O157, *Listeria* RTE, and *Salmonella* RTE product testing uploaded to PulseNet
- PFGE from FSIS *Salmonella* raw product testing accessible through VetNet

Environmental Health





OFO District Offices and OPEER Regional Offices





Product in Commerce

- Office of Program Evaluation, Enforcement and Review
 - Traceback or traceforward of product
 - Locate or detain product
 - Collect product samples for testing
 - Environmental assessment of facilities
- Coordination with Office of Field Operations and public health partners



Product in Establishment

- Office of Field Operations
 - Traceback or traceforward of product
 - Locate or detain product
 - Collect product samples for testing
 - Gather information about production practices
 - Perform assessments
- Coordination with Office of Program Evaluation, Enforcement and Review

“Three-Legged Stool” (putting it all together)





Data Analysis and Assessment

- Data collection and analysis, assessment of findings are ongoing throughout investigation
- Strength of association is measured using established epidemiologic principles
- Framework based on “Procedures to Investigate Foodborne Illness”



Framework for Assessment

- Descriptive Information
- Time sequence
- Plausibility
- Dose-response
- Consistency
- Disease confirmation, laboratory analyses
- Analytical studies



Is there credible evidence
to support an association
between human illness and an
FSIS-regulated product?



Summary and Lessons Learned

- FSIS foodborne illness investigations are multidisciplinary and involve numerous program areas
- Substantial coordination and collaboration are essential between public health partners
- Opportunities exist to assess lessons learned and preventive measures taken

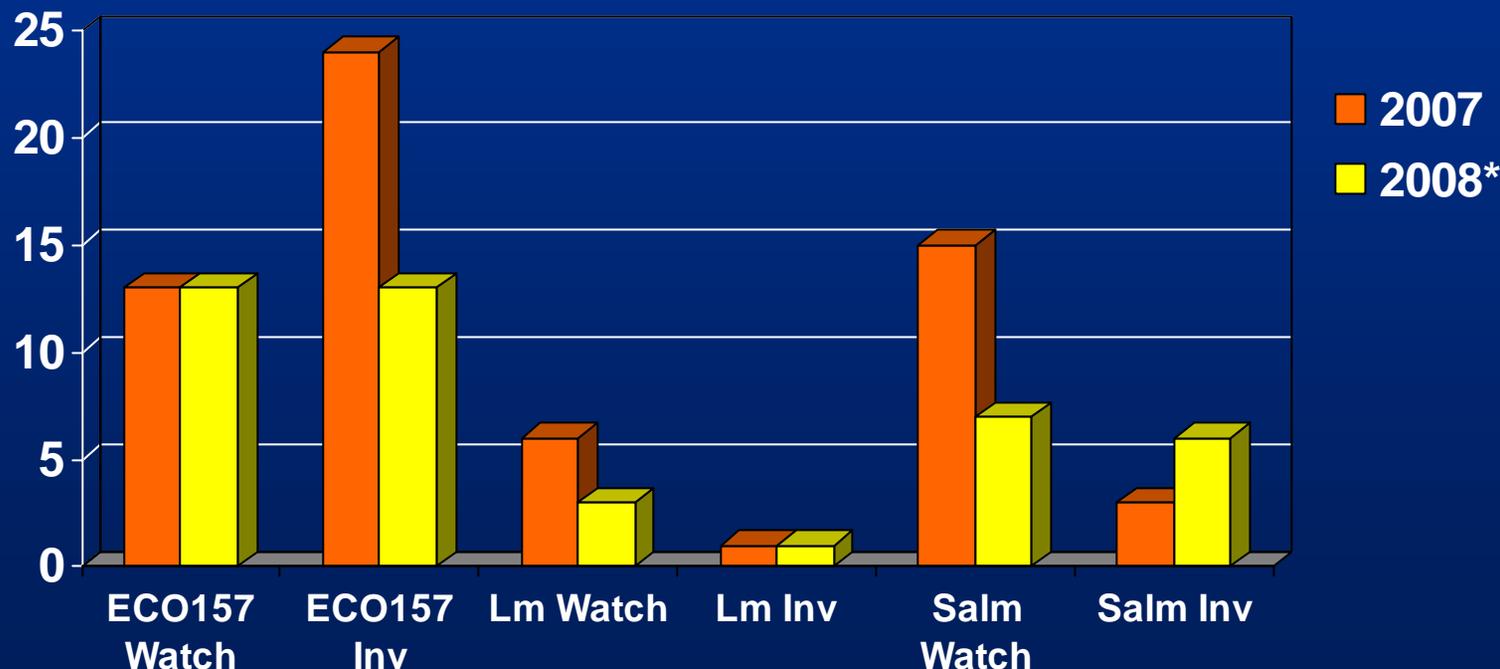


2007-2008*
Foodborne Disease
Investigations Branch Data

* 2008 Data as of 9/24/08



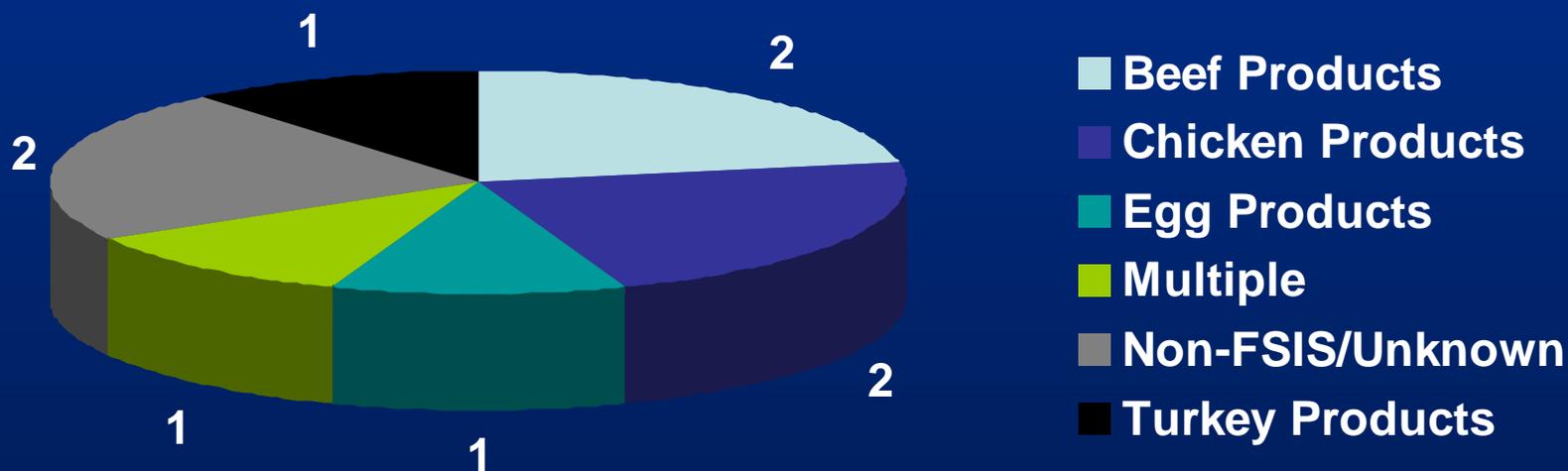
FDIB Activities, 2007-08*



* 2008 Data as of 9/24/08



Salmonellosis Investigations 2007-08*



* 2008 Data as of 9/24/08

United States Department of Agriculture
Food Safety and Inspection Service

