



Shiga Toxin-Producing *E. coli*: Addressing the Challenges, Moving Forward With Solutions

***FSIS Public Health Activities related to
Illnesses from *E. coli* O157:H7 in Raw
Beef Products, 2007***

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April 9, 2008



Objectives

- Describe how FSIS conducts foodborne illness investigations
- Report on 2007 FSIS foodborne illness investigations related to *E. coli* O157:H7
- Discuss areas for improvement



Foodborne Disease Investigations Branch

- Coordinates FSIS foodborne illness investigations
- Staff in two regional offices collaborate with local, state, and territorial public health partners to investigate foodborne illnesses potentially associated with FSIS-regulated product
- Serves as liaison between local health partners and FSIS Inspection Personnel

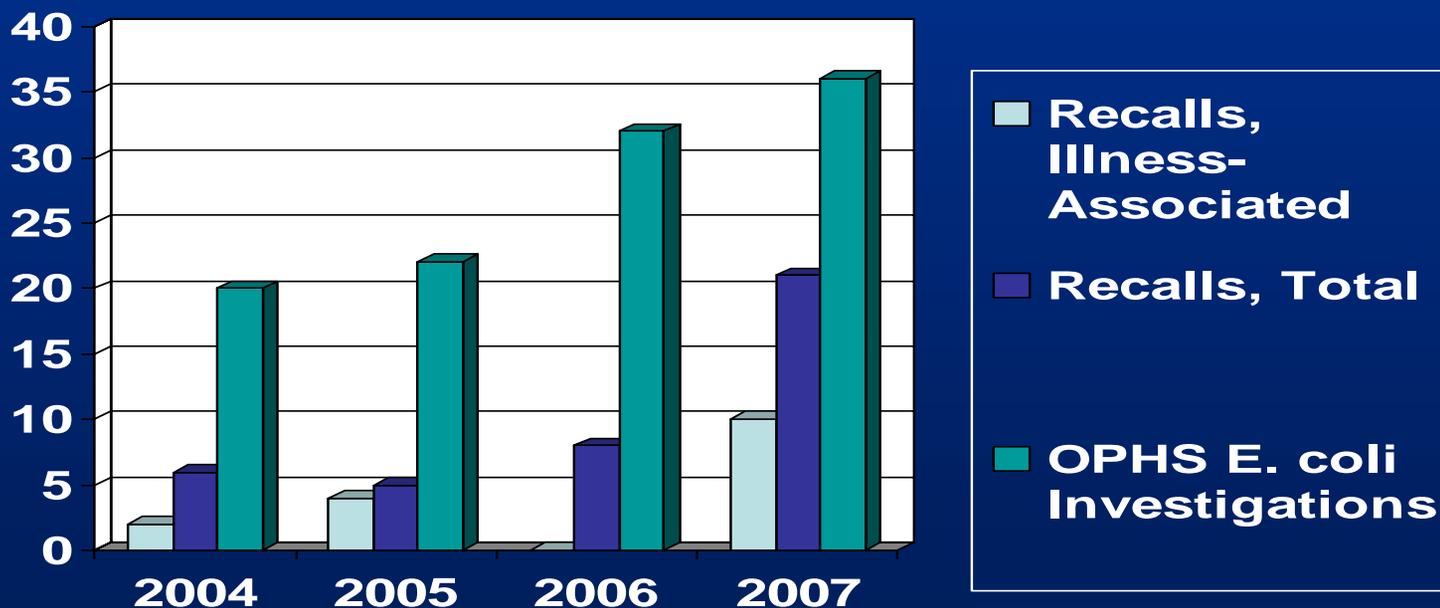


Public Health and Epidemiology Liaisons: Roles and Responsibilities

- Assist with traceback of FSIS-regulated foods potentially associated with foodborne illness to slaughter and processing establishments
- Work with public health partners to collect and sample foods potentially associated with foodborne illness
- Resource for epidemiologic assessments for the Agency, especially during investigations



Investigations and Recalls for *E. coli* O157:H7 in Beef Products, 2004-2007





***E. coli* O157:H7 Illness Clusters**

Associated with Beef Products, 2007

- **Applied Epidemiology Division (AED) investigated 36 *E. coli* O157:H7 illness clusters associated with beef products**
 - **10 voluntary recalls**
 - **1 public health alert**
- **Clusters were linked to regulated product by indistinguishable Pulsed-Field Gel Electrophoresis (PFGE) patterns**
 - **6 combinations new to the PulseNet database**
 - **Remainder were either rare (4) or common (1)**



***E. coli* O157:H7 Illnesses Associated with Beef Products, 2007**

- **170 case-patients (161 culture-confirmed) from 34 states were identified by epidemiology or PFGE pattern analysis for 11 investigations resulting in agency action.**
 - **112 were both culture-confirmed and epidemiologically linked to FSIS product**
 - **# of illnesses: 1 to 47; mean 15.5; median 9**
 - **56 hospitalized**
 - **12 hemolytic-uremic syndrome (HUS)**
 - **No deaths reported**

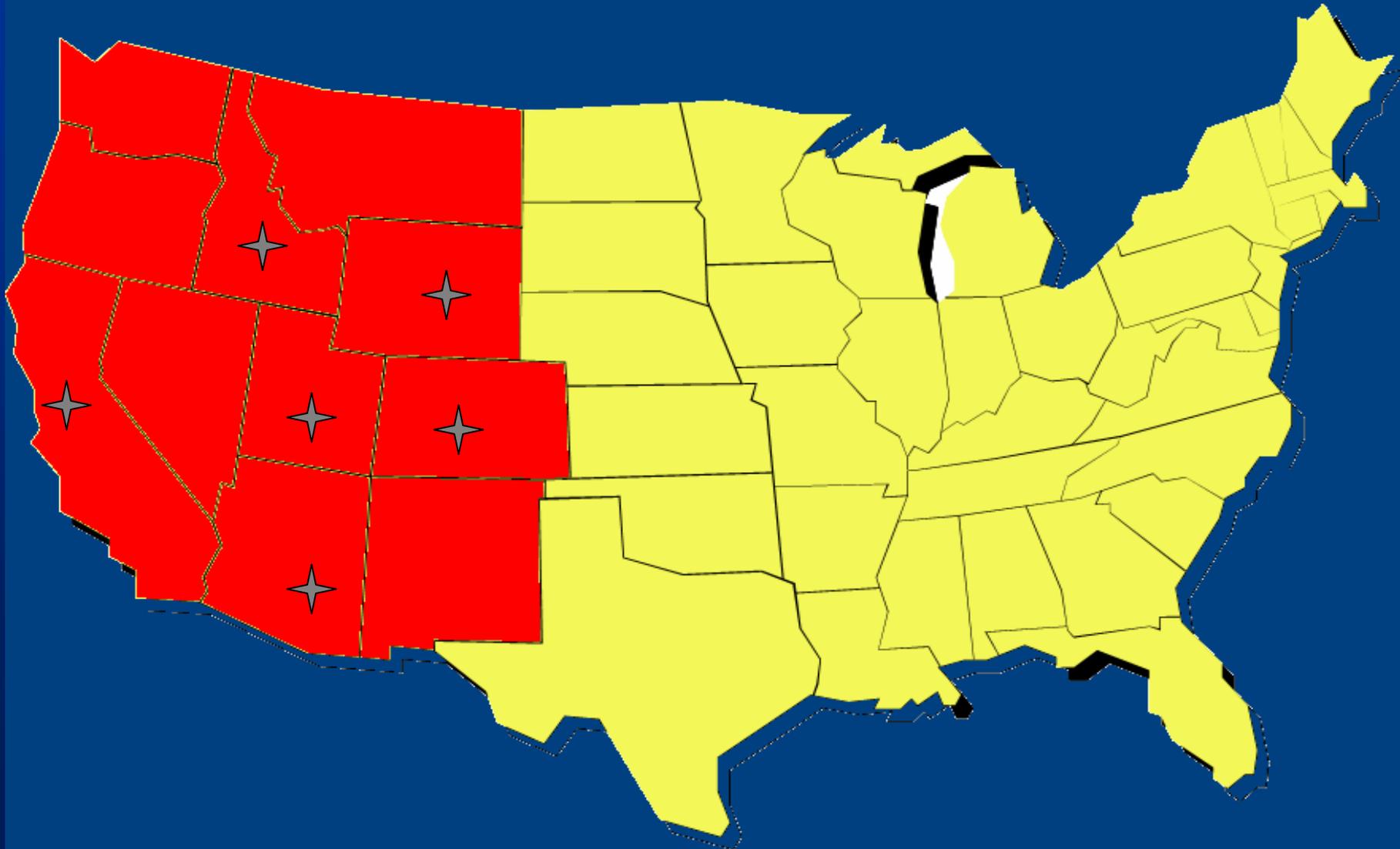


State Collaborations

- State health departments directly contacted FSIS AED in 8 of 11 investigations
 - **AED also contacted via District Office, FSIS CDC Liaison, Food Safety Hotline**
 - **Average 4.7 states per investigation; range 1-16**
 - **Predominantly CDC FoodNet states**
 - **FoodNet states participated in 10 of 11 investigations**
 - **FoodNet states led/co-led 8 of 11 investigations**
- FSIS investigation time from first notification to regulatory action
 - **Average: 9.9 calendar days Range: Same day – 37 days**



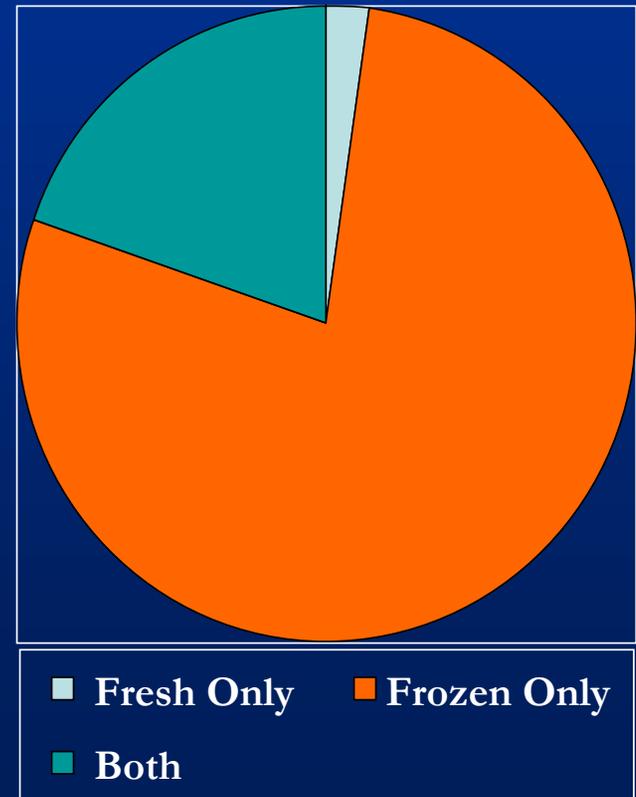
One Establishment – Distribution, Illnesses





Characteristics of Implicated Beef Products, 2007

- **Over 29M lbs of ground beef product impacted (11 events)**
 - Mean: 2.6M; Median: 129,000
 - Range: 5,920 – 21,700,000
- **Type of ground beef products involved (# of events):**
 - Fresh 649,000 lbs (6)
 - Frozen 22.8M lbs (4)
 - Both 5.7M lbs (1)





Size of Establishments Producing Implicated Beef Products, 2007

- Very Small: None
 - Very Small: <10 employees
- Small: 10 of 11 implicated establishments
 - Small: 10-499 employees
- Large: 1 of 11 implicated establishments
 - Large: 500 or more employees



Conclusions

- FSIS reported an increase in *E. coli* O157:H7 investigations and recalls associated with beef products in 2007
- Recalls of frozen ground beef products were noteworthy in 2007
- New technology, such as PFGE, has aided outbreak detection and investigation
- FoodNet sites significantly contributed to investigations leading to regulatory action



Discussion

- Bolstering the public health infrastructure for investigating foodborne illnesses
- Can we address the time between illness diagnosis, FSIS notification, and regulatory action?
- How can we enhance communication and coordination between public health partners?



Discussion

- Do frozen ground beef products present an elevated public health risk?
- Are better mechanisms needed to investigate illness associated with fresh beef products?