



FERN

Uniting Federal, State and Local Laboratories for Food Emergency Response

Food Emergency Response Network FERN

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Division of Field Science
Science without borders to promote global consumer safety



Mission of FERN

Established by

Homeland Security Presidential Directives

Integrate the nation's multilevel food-testing laboratories to detect, identify, respond to and recover from a **bioterrorism** or public health **emergency/outbreaks** involving the food supply.



FERN

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Mission of FERN

■ Approach:

- Preparedness
 - Awareness
 - Surveillance
 - Prevention
 - Build capacity
- Response
- Recovery
 - Surge capacity



Laboratory Makeup

170 Laboratories

■ Affiliations:

- 37 Federal
- 116 State
- 17 Local

■ Disciplines:

- 133 Microbiological
- 108 Chemistry
- 33 Radiological

■ Lab Types:

- 69 Public Health
- 39 Agriculture
- 14 Veterinary Diagnostic
- 9 Environmental
- 39 Other



FERN National Program Office

- Rockville, MD (FDA) and Athens, GA (FSIS)



Duties of NPO -

- Day to day operation of FERN: FERN Support Programs
- Coordinate national laboratory emergency responses
- Oversight: Regional Coordination Centers (RCC)

FERN Regional Coordination Centers

- Five RCCs are located throughout the U.S., one in each region, and are staffed by FDA and FSIS personnel
 - General duties - Identify needs of the region and convey those needs to the NPO



FERN Support Programs

Method Development/Validation

- Select agent methodologies
- “New” agents/toxins/chemicals
- Triage of unknown samples

■ Training

- All three disciplines (Rad, Chem, Micro)
- Select agent training
- Rapid detection methodology training
- Utilization of web-based training courses



FERN Support Programs

■ Proficiency Testing

- Joint PT exercises with other national networks conducted when possible
- All three disciplines (Rad, Chem, Micro) tested

■ Surveillance Testing

- Assessing and demonstrating the effectiveness and capabilities of FERN
- Allows expansion of FDA surveillance programs
- Utilization of state labs

■ Electronic communications and collaboration

- eLEXNET
- FERN website

FERN Cooperative Agreements

- Jointly administered by FDA (Chem, Rad and Micro) and USDA/FSIS (Micro)
 - **14 FERN Chemistry labs funded - FDA**
 - Multi-year agreements
 - “Go-to” labs: PT’s, surveillance, emergencies (Melamine)
 - **5 FERN Rad labs funded - FDA**
 - Same concept as Chem CAP labs
 - 25 FERN Micro labs currently funded - USDA

Micro Cooperative Agreements

15 FERN Micro labs - funded FY 10 by FDA

- Provide large-scale sample analyses
 - Outbreaks
 - Surveillance assignments
 - Surge capacity

- Uniformity of results – data acceptance
 - Common analytical platforms and methods
 - Training and proficiency testing
 - Quality assurance and auditing

- **Model for Integrated Food/Feed Safety System (IFSS)**

FERN Mission Expansion

Why?

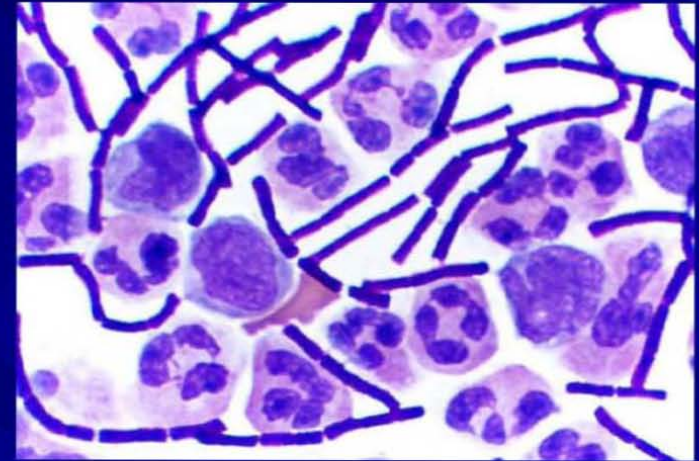
... **bioterrorism** or **public health emergency/outbreaks** involving the food supply. *(Presidential Directives)*

- Transition from exclusively bioterrorism to inclusion of food safety
 - Bioterrorism, while a real threat, hasn't happened
 - Large-scale food events require a mobilization of efforts similar to BT
 - Both are public health emergencies
- Utilization of FERN cooperative agreement labs
 - Labs equipped and ready
 - Grants include large-scale sample analysis
- Integrated Food/Feed Safety System
 - One Mission - One Program
 - State lab data utilization
 - National standards
 - National work plan

Food Defense Issues

■ Microbiological

- *Bacillus anthracis*
- Botulinum toxin
- Others



■ Chemical

- Ricin
- Cyanide
- Others



■ Physical

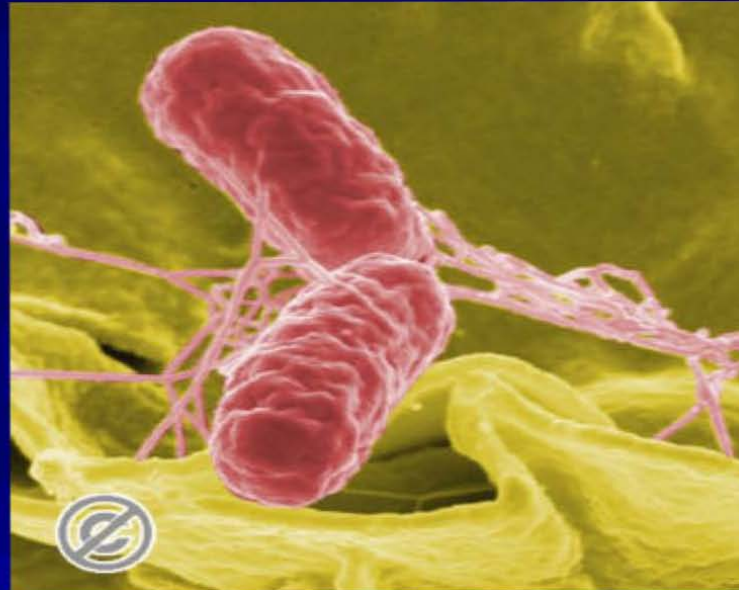
- Physical security of plant
- Personnel



Traditional Food Safety Issues

■ Microbiological

- *Salmonella*
- *Listeria*
- EHEC



■ Chemical

- Mercury
- Arsenic
- Lead

■ Physical

- Filth



Food Safety and Defense in Action

■ EHEC

- spinach

■ Melamine

- Pet food
- Infant formula

■ *Salmonella*

- Peppers
- Peanut Butter



FERN Laboratory Response

Large-scale food events

Fall 2006 – Spinach Outbreak – *E coli* O157:H7

- 205 confirmed illnesses
- 104 hospitalizations
- 31 cases of HUS
- 4 deaths
- Multiple spinach recalls

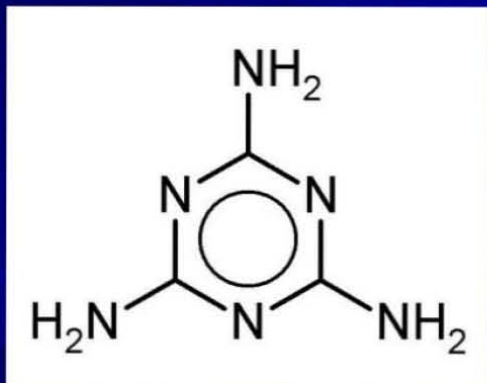


- First time FERN was activated
- Utilization of a FERN/LRN harmonized screening method
 - Real time PCR
 - Allowed for quick, uniform screening of many samples
 - Method and reagents supplied to LRN

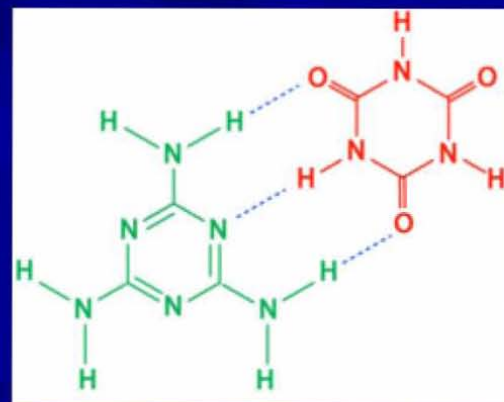
Large-scale food events

■ Melamine in Pet Food

- Eight FERN Chemistry Cooperative Agreement labs participated in FDA Protein Surveillance Assignment
 - analyzed over 200 samples of protein products
- FERN Storeroom supplied hard-to-find standards
- FERN NPO acted as a clearing house of information – methods, results, etc



Melamine



Melamine (green) +
Cyanuric acid (red) =
Kidney crystals

Large-scale food events

■ Melamine in Milk Products

- FERN chem labs assisted FDA in the analysis of samples
- FDA assignment written for FERN chemistry labs.
- FERN helped clear very large FDA sample backlog



Large-scale food events

■ *Salmonella Saintpaul* in Peppers

- 1442 illnesses in 43 states, D.C., and Canada
- 584 samples tested by ORA labs
- Twelve FERN labs tested 290 pepper/cilantro/basil samples collected by the states
 - 11 *Salmonella* positives.
- FERN testing augmented and complemented FDA efforts
- FERN testing and subsequent data sharing with FDA also brought to attention a smaller *S. Oranienburg* outbreak, concurrent to the *S. Saintpaul* outbreak.



Large-scale food events

- *Salmonella Typhimurium* in Peanut Butter
 - 691 illnesses in 46 states
 - Use of state analytical data for outbreak/epi determinations
 - FERN labs utilized for a state-driven initiative to test manufacturing plant after clean up



Network Outreach – Other Agencies

■ Federal MOUs/Interactions:



CDC – Laboratory Response Network (LRN)
common labs
method and PT harmonization



FBI – with Forensic Chemistry Center

EPA – in development



DHS – Integrated Consortium of Lab Networks

FERN Interaction with other National Laboratory Networks

- Coordinated through the [Interagency Consortium of Laboratory Networks](#) - (ICLN) - Dept of Homeland Security

Mission of the ICLN:

- Improved coordination of laboratory response to incidents
- Assess, fill gaps in coverage across multiple sample types, potential victim groups (human, animal, plant), all WMD, all response phases
- Promote common standards of performance across all lab response assets to ensure data supporting homeland security decisions is best quality and defensible



ICLN Member Laboratory Networks

- Food Emergency Response Network
FERN
- National Animal Health Laboratory Network
NAHLN
- National Plant Diagnostic Network
NPDN
- Laboratory Response Network
LRN
- Environmental Laboratory Response Network
eLRN



For Further FERN Information

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