

Rapid Detection Tools

David W. K. Acheson, M.D., F.R.C.P.
Associate Commissioner for Foods
U.S. Food and Drug Administration



Outline

- Detection challenges
- Anatomy of an outbreak
- FDA's role during an outbreak
- The importance of rapid detection tools



Detection Challenges

■ Outbreak situations

- Human samples
- Food samples
- Environmental samples (e.g., soil, water)
- Animal samples

■ Routine situations

- Sampling during inspections
 - Domestic/Imports



Detection Challenges

■ Speed

- In the early stages to identify cases
- To determine *Salmonella* in food samples
- To serotype and genetically type isolates

■ Ease of use in the field

- During investigations
- During import inspections



Anatomy of an Outbreak

■ Consumer Illness

- Consumption of contaminated food
- Development of symptoms
- Visit physician
 - Take stool sample
 - Analyze sample in a clinical microbiology laboratory
 - Find a pathogen (e.g., *Salmonella*)



5

Anatomy of an Outbreak

■ Case Finding

- Clinical lab sends bacterial isolate to local/state lab
- Local/state lab confirms the isolate
- Local/state lab does genetic fingerprinting (PFGE)
- Fingerprint submitted to central data base (PulseNet)
- States report cases to CDC daily

■ Case Exposure Information

- Local health department interviews patient using a standard questionnaire – collects consumption and product information



6

Anatomy of an Outbreak

- Multiple Case Finding
 - Multiple patients have the same pathogen
 - Food histories reviewed for common feature
 - Same genetic fingerprints found in multiple states
 - Determine which foods are the most likely
 - Set up a case control study
 - Identify most likely food
- FDA takes next steps



7

Anatomy of an Outbreak

FDA's Role

- Discuss recall with firm if source identified
 - Issue press
 - Communicate with the public/media
- Product Tracing
 - Determine where product came from and where it went
 - Secondary recalls
 - Food preparation review; processor, distributor and farm investigations
- Testing
 - Leftover product from case-patients
 - Food samples obtained during inspections
 - Environmental samples



8

Anatomy of an Outbreak *FDA's Role*

- Source Determination
 - Inspect and take samples in the plant
 - On the farm
- Consumer Communication
- Prevent Reoccurrence
- Learn from what went wrong
 - How and where did the contamination occur



Salmonella – 2008

- 1450 + cases
- 43 states + DC
- Multiple food types
- Complex traceback to identify source



Sequence of Events

- Late May 2008 - CDC gave FDA an early alert of *Salmonella* Saintpaul illnesses in NM & TX
 - Tomatoes a likely vehicle
- May 31st, CDC notifies FDA that tomatoes are implicated
- FDA initiates product tracing on Tomatoes
- Many tomato samples tested for *Salmonella*



Sequence of Events

- Tomatoes trace to FL and Mexico
- Inspections initiated
- Outbreak continues
- CDC/states undertake second case control study
 - Tomatoes still implicated
 - Jalapeno and Serrano peppers now implicated as well



Sequence of Events

- July traceback of peppers
- July 21 positive sample found at distributor in TX
 - Trace back to MX
- Inspection and sampling on farms in MX
- July 30th positive samples found on farm in MX



Summary

- Rapid detection
 - During the formative stages of an outbreak
 - For food and environmental samples
- Identify the problems faster
- Eliminate negatives faster
- Public health gains
 - Better protection
 - Great availability of products not implicated in an outbreak

