PTIN Food Safety Incident Management Workshop

Big Sky, Montana, USA
14-15 May 2011

Asia-Pacific Economic Cooperation (APEC)
Food Safety Cooperation Forum (FSCF)
Partnership Training Institute Network (PTIN)

APEC
Asia-Pacific Economic Cooperation

FSCF Food Safety Cooperation Forum
PTIN Partnership Training Institute Network

FOOD STANDARDS Australia New Zealand
Te Mana Kounga Kai – Ahitereiria me Aotearoa

Building Capacity for the Identification of Emerging Food Safety Risks

David P. Goldman, MD, MPH

Assistant Administrator

Office of Public Health Science

United States Department of Agriculture

Food Safety and Inspection Service

APEC FSCF PTIN Food Safety Incident Management Workshop

Big Sky, Montana, USA - May 15, 2011

What is FSIS?

United States Department of Agriculture
Food Safety and Inspection Service

The **Food Safety and Inspection Service** (FSIS) is the public health agency in the U.S. Department of Agriculture responsible for ensuring that the nation's commercial supply of meat, poultry, and egg products is safe, wholesome, and correctly labeled and packaged.

Food Safety Challenge

United States Department of Agriculture
Food Safety and Inspection Service

The U.S. Centers for Disease Control and Prevention (CDC) recently reported that 80% of foodborne illness acquired in the United States comes from 'unspecified agents.'

Sources:
•Scallan E, Hoekstra RM, Angulo FJ, Tauxe RV, Widdowson M-A, Roy SL, et al. Foodborne illness acquired in the United States—major pathogens. *Emerg Infect Dis*. Jan. 2011.
•Scallan E, Griffin PM, Angulo FJ, Tauxe RV, Hoekstra RM. Foodborne illness acquired in the United States—unspecified agents. *Emerg Infect Dis*. Jan. 2011.

Identifying Emerging Food Safety Risks

United States Department of Agriculture
Food Safety and Inspection Service

Process used to identify, assess and evaluate local, regional, or global food safety incidents:

- Awareness
- Knowledge-gathering and risk management
- Analysis
  - rapid risk evaluation (chemical hazard)
  - risk profile/risk assessment (microbial hazard)
- Response
- Evaluation and data management

Awareness

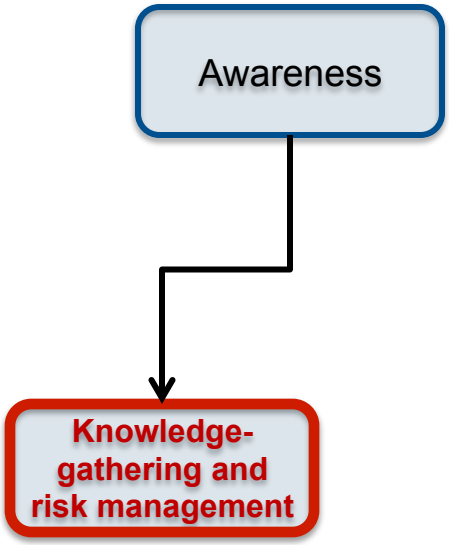
United States Department of Agriculture
Food Safety and Inspection Service

- From within USDA/FSIS
  - inspectors and veterinarians in the field
  - laboratory capacity, performance-based methods
  - interdisciplinary teams at HQ: veterinarians, epidemiologists, microbiologists, toxicologists, statisticians, risk analysts
- Scientific cooperation
  - scientific papers, publications, conferences
  - new pathogens, veterinary practices, environmental concerns, methodologies
- Federal/state/local/tribal relationships
- Federal Inter-agency coordination
  - FSIS, FDA, EPA, CDC, AMS, APHIS, ARS
- International communication
  - trading partners, Codex Alimentarius, EFSA, APEC

Knowledge-gathering and risk management

United States Department of Agriculture
Food Safety and Inspection Service

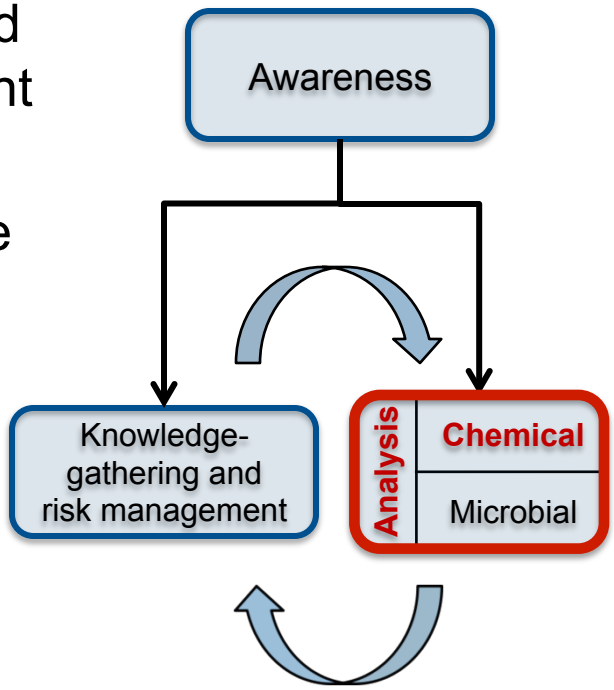
- Obtain necessary data from the field
  - test results for microbes or chemicals, type and amount of affected product, disposition of affected product
- Determine whether health hazard could exist
  - targeted literature research and information-gathering
- Determine USDA's regulatory authority
- Allocate resources, if appropriate and feasible
  - identify relevant experts within FSIS and from other agencies (if necessary)
  - commission risk analysis/safety assessment
- Maintain communication with analysts and experts performing risk analysis
  - gather additional data
  - refine risk question or scope
  - respond to changing developments



Chemical Hazard: Risk Evaluation

United States Department of Agriculture
Food Safety and Inspection Service

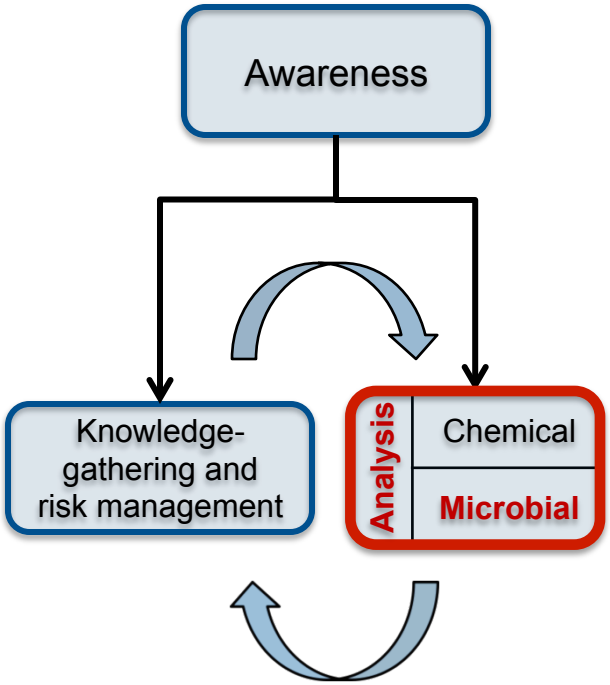
- Quantitative evaluation of human exposure and health impact following a contamination incident
- If non-negligible human exposure is expected, this exposure is compared to a reference value
  - Reference Dose (RfD), Acceptable Daily Intake (ADI)
- Incidents range widely in scope
  - single lot of product in one establishment
  - regional contamination, several producers
  - contamination of imported products
- Common sources of chemical hazards
  - accidental contamination during processing
  - environmental or industrial contaminants in animal feed, grass, soil, or water
- Ultimate result: a public health recommendation based on available data and science



Microbial Hazard: Risk profile/assessment

United States Department of Agriculture
Food Safety and Inspection Service

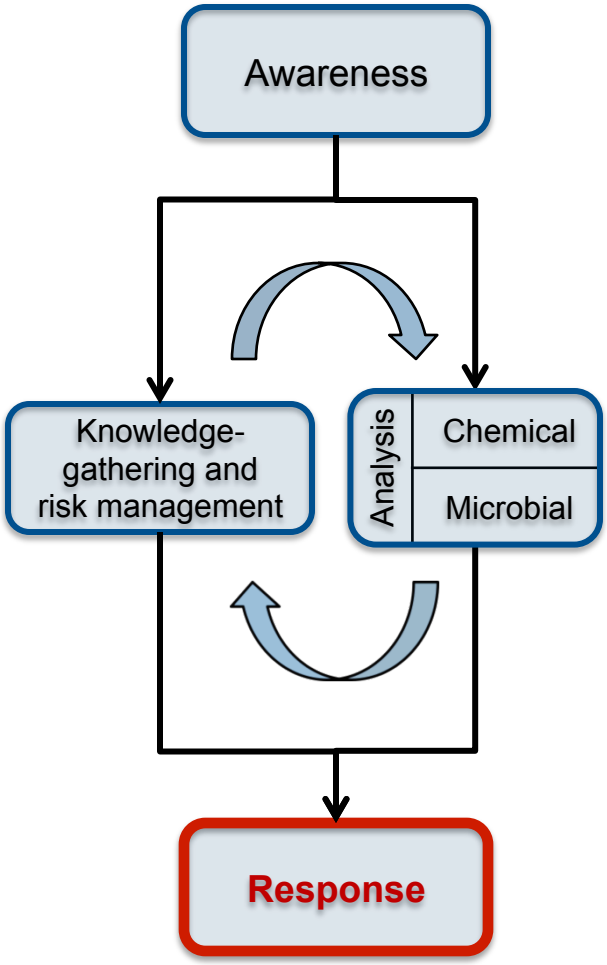
- Systematic compilation and consideration of all pertinent scientific data and information
  - description of the food safety problem
  - contamination information
  - human illness information
  - Data analysis if appropriate/available
- Evaluate whether the hazard poses a concern
  - How likely is it to cause foodborne illness ?
- Guide decisions, make recommendations
  - How might the risk from this hazard be controlled?
  - What control options are available?
  - Is regulatory action appropriate?



Response

United States Department of Agriculture
Food Safety and Inspection Service

- Short term
  - Apply USDA mark of inspection
  - Retain in anticipation of further information or analyses (**gather more data**)
  - Withhold the mark of inspection; condemn product
  - Recall, if product is already in commerce
- Longer term
  - Follow-up coordination or investigations with other federal agencies (FDA, EPA, APHIS) and/or international partners
  - Communicate incident and its potential to pose a recurring public health risk
  - Commission a full, quantitative risk assessment



Evaluation and Data Management

United States Department of Agriculture
Food Safety and Inspection Service

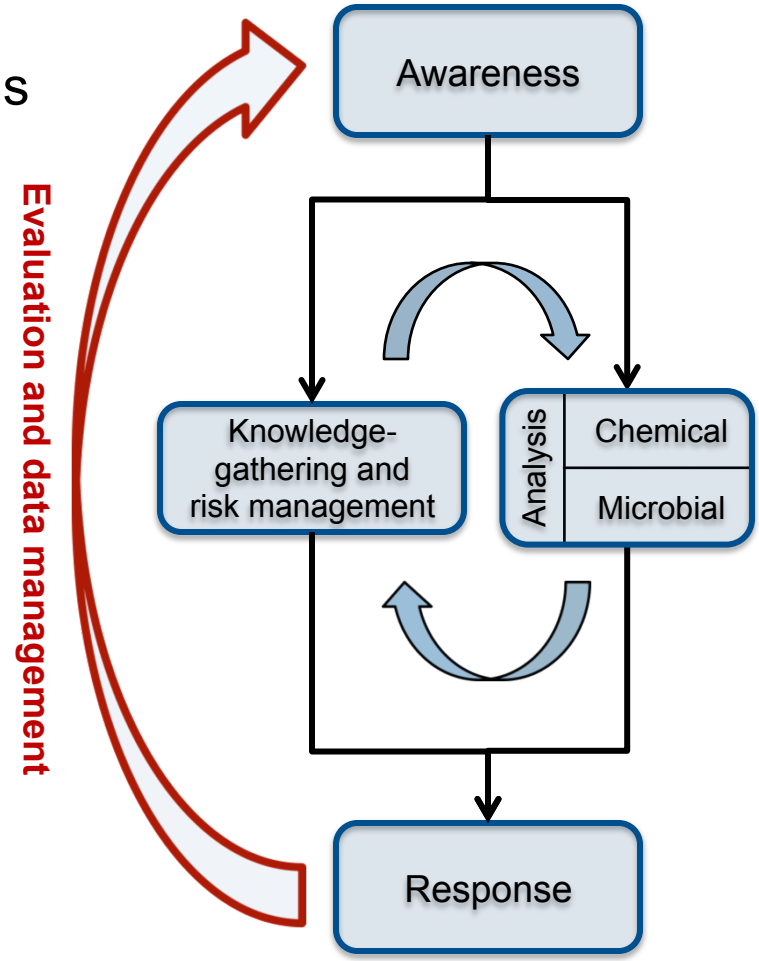
- Learn from the experience
- Data management: store incident records and data sources for future use
- Public Health Information System
- Future work: incident database

Incident record

- information regarding each contamination incident
- information to be included: background, list of resources used, analysis, reports, resolution

Resource library

- growing collection of data and resources available to risk assessment staff
- chemical/physical properties, safety limits and tolerances, animal processing, human consumption rates, links to online resources



- Goal: heighten **awareness** for future incidents

Examples

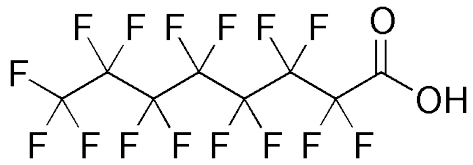
United States Department of Agriculture
Food Safety and Inspection Service

- Perfluorinated compounds (PFCs) in beef
- Highly Pathogenic Avian Influenza Virus (HPAI) H5N1 in poultry meat and eggs

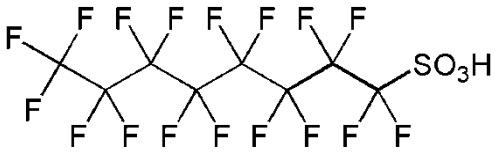
PFC Contamination

United States Department of Agriculture
Food Safety and Inspection Service

- Biosludge from a wastewater treatment plant had been contaminated with perfluorinated compounds (PFCs)
  - PFCs are persistent organic pollutants used in plastics, electronics, non-stick coatings, stain and water repellents, etc.



PFOA – Perfluorooctanoic acid



PFOS – Perfluorooctane sulfonic acid

- Biosludge was spread on fields near Decatur, Alabama
- Exposure of cattle grazing on these fields

PFC Contamination

United States Department of Agriculture
Food Safety and Inspection Service

- Awareness
  - in this case: collaboration with other federal agencies (EPA)
- Knowledge-gathering and data management
  - EPA took soil and water samples from the affected area, testing them for PFCs
  - identifying affected farms using biosludge distribution and cattle-holding records
- Rapid Risk Evaluation
  - FSIS developed a quantitative model to estimate human dietary exposure to PFCs based on the concentration in the soil and water
  - “most likely” and “worst case” scenarios were considered
  - acceptable daily intakes (ADIs) were estimated based on EPA reference doses and the underlying animal toxicity studies for both acute and subchronic exposures
  - predicted exposure to consumers was well below the acute ADI, but in some cases near the subchronic ADI

PFC Contamination

United States Department of Agriculture
Food Safety and Inspection Service

- Response
  - FSIS laboratories develop method to test for PFC in animal tissue
    - public health basis for method limit of detection: necessary limit informed by rapid risk evaluation method based on EPA RfD
  - conclusion that there was no immediate threat to public health, since exposure at these levels was not chronic
- Evaluation and follow-up
  - Slaughtered cattle were eventually tested for PFCs using newly-developed laboratory method
  - Observed residues aligned with predicted values
  - Human exposure quantified based on CDC measures of PFCs in blood

HPAI Threat to U.S. Poultry

United States Department of Agriculture
Food Safety and Inspection Service

- Awareness
  - Emergence of H5N1 bird flu in Asia
- Knowledge-gathering and risk management
  - Systematic literature review
    - HPAI is not considered to be a foodborne pathogen although the virus has been isolated from poultry muscle and the interior of eggs.
  - Interagency workgroup developed to answer what would be the appropriate reaction if this disease reached the US?
    - FSIS Response – poultry meat and processed eggs
    - FDA (Food and Drug Administration) Response – shell eggs
    - APHIS (Animal and Plant Health Inspection Service) – animal health

HPAI Threat to U.S. Poultry

United States Department of Agriculture
Food Safety and Inspection Service

- Assessment of the risk/determination of risk profile
  - Developed risk assessment models simulating human exposure and potential illness from consumption of HPAIV.
  - Data
    - Coordination with international scientists
    - USDA Agricultural Research Service (ARS) and US poultry and egg industries
  - Peer Review
    - Formal external peer review (Office of Management and Budget, 2004)
    - Government reviews:
      - Centers for Prevention and Disease Control (CDC)
      - USDA Office of Risk Assessment and Cost Benefit Analysis
      - ARS
      - APHIS
      - FDA
    - Federal Register Notice requesting public and stakeholder input

HPAI Threat to U.S. Poultry

United States Department of Agriculture
Food Safety and Inspection Service

- Response
  - Risk assessments used as a tool to evaluate mitigation scenarios should HPAI be identified in the U.S.
  - Risk from consumption of contaminated poultry or eggs is very low
    - Probability of a an infected yet undetected flock entering commerce is low (<5%).
    - 1 predicted illness in about 600,000 exposures to poultry meat; no predicted illnesses from egg exposure
- Evaluation and follow-up
  - Science and Risk-Based Approach to HPAI Preparedness and Response
    - The Secure Egg Supply Plan (SES) is a science-based preparedness plan developed by the Egg Sector Working Group, which includes representatives of the industry, government and academia (http://secureeggsupply.com/).
    - Memorandum of Understanding (MOU) to be developed with APHIS to develop additional proactive risk assessments to protect animal health

Lessons Observed

United States Department of Agriculture
Food Safety and Inspection Service

- Information sharing is essential
  - Transparency among public health partners
  - Local, state, federal, and international coordination & communication
  - Need for common food safety communication systems to prevent public health emergencies
- Iterative approach to managing/preventing food safety risks
  - Use of various public health tools – epidemiology, laboratory testing, chemical usage
  - Risk assessors and risk managers must have on-going interaction
    - Continuous evaluation of data/information and iterative sets of decisions to prevent foodborne illness
- Use of science and analytics to evaluate risk and guide operations
  - Analytic tool must be "fit for purpose" to guide risk management decisions
    - risk profiles, risk assessments, safety assessments, risk evaluations

Thank you very much

United States Department of Agriculture
Food Safety and Inspection Service

Any questions?

Except where noted, the views presented in
this presentation are solely those of the presenter.

PTIN Food Safety Incident Management Workshop

Big Sky, Montana, USA
14-15 May 2011

Asia-Pacific Economic Cooperation (APEC)
Food Safety Cooperation Forum (FSCF)
Partnership Training Institute Network (PTIN)

APEC
Asia-Pacific Economic Cooperation

FSCF Food Safety Cooperation Forum
PTIN Partnership Training Institute Network

FOOD STANDARDS Australia New Zealand
Te Mana Kounga Kai – Ahitereiria me Aotearoa