Measuring Establishment Risk for Risk-Based Inspection

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The views presented in this talk represent the author’s views and are not necessarily an official position of the Food Safety and Inspection Service

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Resource Deployment Resources

Traditional
- Based on what needs to be done
  - Inspecting carcasses
  - Inspect once per shift

Risk-Based
- Align resources also with level of risk:
  - Inspecting carcasses
  - Inspect once per shift
  - Inherent Risk
  - Risk Control Effectiveness
SBA Size

- Very Small, 2668
- Small, 2097
- Large, 364
- Not Known, 39
Number of Shifts

2 Shifts
1125

1 Shift
4043
Type of Establishment

- Processing: 4117
- Combination: 1051

Total: 5178
Inspection Procedures and Sales

![Graph showing inspection procedures and sales over establishments.](image)
Risk Concepts for RBI

- **Inherent Risk**: inherent establishment-level public health risk

- **Risk Control Effectiveness**: operational effectiveness of an establishment’s food safety systems
Determinants of Inherent Risk

- Species/Market Class/Ingredients
- Process
- Interventions
- Production Volume/Exposure
2001 Inherent Risk Formula

(Species + Process) x Volume

Fully-cooked pork  \((2.3 + 3) \times 2\) = 10.6
Fully-cooked turkey \((4.0 + 3) \times 2\) = 14.0
Canned pork \((2.3 + 1) \times 2\) = 6.6
Canned turkey \((4.0 + 1) \times 2\) = 10.0
2006 Inherent Risk Formula

(Species/Process) x Volume

- 2005 Expert Elicitation for 24 species/process combinations
- Establishment Volume Survey
Risk Control Components

- Food Safety System Design
- Food Safety System Implementation
- Pathogen Control
- In-Commerce Findings
- Enforcement Actions
- Other Components
Food Safety System Design

- Efficacy of the food safety system
- Food Safety Assessment Findings
  - When was the last FSA?
  - What was the outcome?
Food Safety System Implementation

- FSIS documents all regulatory noncompliances— and will continue to do so under RBI
- However, not all NRs are equally indicative of risk control deficiencies
- Our goal is to identify, enumerate, and properly weight public health-related NRs
Pathogen Control

- Pathogen Control in Ready-to Eat Products, Ground Beef, and Other Raw Products
  - *Lm, Salmonella,* and *E. coli* O157:H7, and RTE testing program results
  - *E. coli* O157:H7 (raw ground beef) testing program results
  - *Salmonella* verification testing program results
In-Commerce Findings

- Adverse Findings In-Commerce
  - Significant Consumer Complaints?
  - Class I or II Recalls?
  - Other Considerations?
Enforcement Actions

- Involving Food Safety
- Not preceded by significant NRs
- Not initiated as a result of an FSA
Other Considerations

- Other Serious Public Health Concerns
  - *E. coli* O157:H7 Positives Suppliers?
  - AMS school lunch testing results?
  - Others?
Resource Deployment Under RBI

- Higher Inherent Risk → More Inspection Resources
- Lesser Risk Control → More Resources
Donald W. Anderson is the Deputy Director of the Policy and Evaluation and Improvement Staff (within OPEER) at the Food Safety and Inspection Service. Upon completing the Master of Economics program at North Carolina State University in 1979, Don joined RTI International, where he was an economist for 24 years. Since joining FSIS in 2006, Don has taken a lead role in the development of an improved risk-based inspection program, focusing on methods for measuring inherent public health risk and risk control effectiveness in meat and poultry processing establishments.

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Industry perspectives on incentives for food safety innovation
Continuous food safety innovation as a management strategy
  Dave Theno, Jack in the Box, US
Economic incentives for food safety in their supply chain
  Susan Ajeska, Fresh Express, US
Innovative food safety training systems
  Gary Fread, Guelph Food Technology Centre, Canada

Organizational and technological food safety innovations
Is co-regulation more efficient and effective in supplying safer food?
  Marian Garcia, Dept. of Agricultural Sciences, Imperial College London
  Andrew Fearne, Centre for Supply Chain Research, University of Kent, UK
Chain level dairy innovation and changes in expected recall costs
  Annet Velthuis, Cyriel van Erve, Miranda Meuwissen, & Ruud Huirne
  Business Economics & Institute for Risk Management in Agriculture, Wageningen University, the Netherlands
Regulatory food safety innovations
Prioritization of foodborne pathogens
  Marie-Josée Mangen, J. Kemmeren, Y. van Duynhoven, A.H. and Havelaar, National Institute for Public Health & Environment (RIVM), the Netherlands
Risk-based inspection: US Hazard Coefficients for meat and poultry
  Don Anderson, Food Safety and Inspection Service, USDA
UK HAS scores and impact on economic incentives
  Wenjing Shang and Neal H. Hooker, Department of Agricultural, Environmental & Development Economics, Ohio State University

Private market mechanisms and food safety insurance
Sweden’s decade of success with private insurance for Salmonella in broilers
  Tanya Roberts, ERS, USDA and Hans Andersson, SLU, Sweden
Are product recalls insurable in the Netherlands dairy supply chain?
  Miranda Meuwissen, Natasha Valeeva, Annet Velthuis & Ruud Huirne, Institute for Risk Management in Agriculture; Business Economics & Animal Sciences Group, Wageningen University, the Netherlands
Recapturing value from food safety certification: incentives and firm strategy
  Suzanne Thornsbury, Mollie Woods and Kellie Raper, Department of Agricultural Economics, Michigan State University
Applications evaluating innovation and incentives for food safety
Impact of new US food safety standards on produce exporters in northern Mexico
Belem Avendaño, Department of Economics, Universidad Autónoma de Baja California, Mexico and Linda Calvin, ERS, USDA
EU food safety standards and impact on Kenyan exports of green beans and fish
Julius Okello, University of Nairobi, Kenya
Danish *Salmonella* control: benefits, costs, and distributional impacts
Lill Andersen, Food and Resource Economics Institute, and Tove Christensen, Royal Danish Veterinary and Agricultural University, Denmark

Wrap up panel discussion of conference
FSN section rep. – Tanya Roberts, ERS, USDA
AEM section rep. – Randy Westgren, University of Illinois
INT section rep. – Julie Caswell, University of Massachusetts
FAMPS section rep. – Jean Kinsey, University of Minnesota
Discussion of everyone attending conference
Note: speaker is either the 1st person named or the person underlined.

Thanks to RTI International for co-sponsoring the workshop.
Workshop objectives
- Analyze how new public policies and private strategies are changing economic incentives for food safety,
- Showcase frontier research and the array of new analytical tools and methods that economists are applying to food safety research questions,
- Evaluate the economic impact of new food safety public policies and private strategies on the national and international marketplace,
- Demonstrate how new public polices and private strategies in one country can force technological change and influence markets and regulations in other countries, and
- Encourage cross-fertilization of ideas between the four sponsoring sections.

Workshop organizing committee
Tanya Roberts, ERS/USDA, Washington, DC - Chair
Julie Caswell, University of Massachusetts, MA
Helen Jensen, Iowa State University, IA
Drew Starbird, Santa Clara University, CA
Ruud Huirne, Wageningen University, the Netherlands
Andrew Fearne, University of Kent, UK
Mogens Lund, FOI, Denmark
Mary Muth, Research Triangle Institute Foundation, NC
Jayson Lusk, Oklahoma State University, OK
Randy Westgren, University of Illinois, IL
Darren Hudson, Mississippi State University, MI