United States Department of Agriculture
Food Safety and Inspection Service

National Advisory Committee on Meat and Poultry Inspection

August 8-9, 2007

Issue Paper:
Linking FSIS Activities to its Public Health Goals

Overview of Presentation

- Background
- Approaches to Linking FSIS Activities to its Public Health Goals
- Questions for Sub-Committee
- Contact Person

Background

- FSIS mission to protect public health through food safety and food defense
- Exploring ways to allocate FSIS resources based on sound science and risk
- Addressing question of how to assess the links between FSIS' activities and the agency's public health goals

Background

	Council on Food Safety Goals for Percent Decrease by 2005 (target number of cases)	Healthy People 2010 Goals for Percent Decrease by 2010 (target number of cases)
Salmonella species	50% reduction in illness from *Salmonella enteritidis* in eggs (0.95 cases per 100,000 people)	50% reduction in infections caused by *Salmonella* species (6.8 cases per 100,000 people)
Campylobacter species	25% (18.5 cases per 100,000 people)	50% (12.3 cases per 100,000 people)
Escherichia coli O157:H7	25% (1.6 cases per 100,000 people)	50% (1.0 cases per 100,000 people)
Listeria monocytogenes	50% (0.25 cases per 100,000 people)	50% (0.25 cases per 100,000 people)

Background

Seeking NACMPI recommendations on approaches to determine the relationship between:

i. FSIS' inspection activities (A) and microbial contamination rates in FSIS-regulated foods (B)

Background

Seeking NACMPI recommendations on approaches to determine the relationship between:

ii. Microbial contamination rates in FSIS-regulated foods (B) and food-related microbial human illness (C)

Background

Seeking NACMPI recommendations on approaches to determine the relationship between:

iii. How to directly link FSIS inspection activities (A) to changes in the incidence of food-related microbial human illness (C)

Potential Approaches for Linking FSIS Activities to Contamination

- Correlation analyses between subsets of Noncompliance Records (NRs) and microbial contamination
- Microbial risk assessments

Correlation Analyses between Subsets of Noncompliance Records (NRs) and Microbial Contamination

- Use a subset of NRs thought to be most related to a given microbial contamination
- Compare probability of having a positive test result to probability of having an NR
- Examine correlations looking at presence (yes/no) of an NR over different lengths of time (e.g., a day, a week, a month) and total number of NRs in a given period of time

Microbial Risk Assessments

- Use available data on prevalence, enumeration, and serotype of contamination, and control measures in place to estimate, forward through the food supply, the level of a given pathogen present on a given food product
- Takes into account growth curves and decline/survivability at various points in food production/processing
- Can estimate product contamination levels up to point of consumption
- Can estimate impact of FSIS HACCP procedures on pathogen levels

Potential Approaches for Linking Contamination to Public Health

- Correlation analyses
- Expert elicitation
- Analysis of outbreak information
- Risk assessments
- Risk assessments and Food Safety Objectives

Correlation Analyses

- Examine trends in FSIS microbial data and compare to trends in public health data

B → C

Expert Elicitation

- Seek expert opinion regarding which FSIS-regulated foods are of greatest hazard from a food safety perspective
- Results of expert elicitation can provide relative ranking of the inherent hazard, from a foodborne illness standpoint, of FSIS-regulated products
- Provides information, when combined with consumption estimates, on which foods might account for the greatest proportion of foodborne illness

B → C

Analyses of Outbreak Information

- Use data from outbreaks for which investigations have identified food and pathogen involved
- Determine percentage of outbreaks associated with particular FSIS-regulated foods

B → C

Microbial Risk Assessment

- Use statistical models to quantify the contribution of food sources to a human illness (pathogen-specific)
- Can incorporate prevalence, enumeration and subtype of microorganisms in FSIS-regulated foods, food consumption, and serotype information (link public health endpoint and source of infection) into the model
- Generates dose-response curves for a given pathogen
- Can include uncertainty analysis
- Estimates the number of cases that would be associated with particular food types

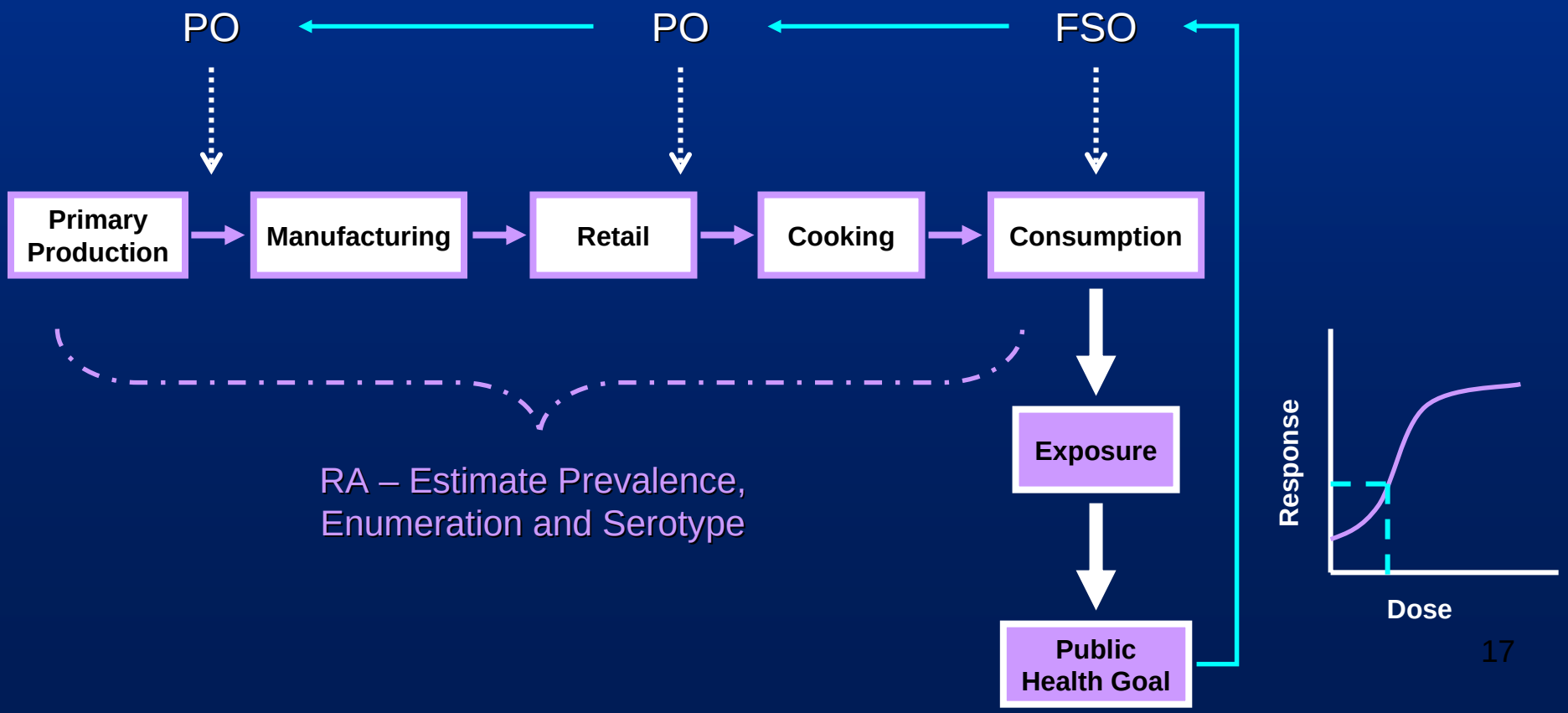
B → C

Microbial Risk Assessments and Food Safety Objectives

- Formalized method to link stated public health goals to pathogen prevalence in foods
- Use dose-response curves (generated in risk assessment) to connect to the level of a pathogen in a food at the time of consumption (the food safety objective, FSO)
- Can connect to the level of pathogen at various points in the food chain (Performance Objectives, POs) that would not result in exceeding the FSO

B → C

Microbial Risk Assessments and Food Safety Objectives



Approaches Linking Activities to Public Health

- If A is related to B,

  And B is related to C,

  Then A is related to C
- Methods to directly relate FSIS inspection activities (A) to the incidence of food-related microbial human illness (C)?

Questions

1. What analyses or approaches would you propose to determine the relationship between FSIS' inspection activities and contamination rates in FSIS-regulated foods (e.g., correlation analyses, etc.)?

Questions

2. What analyses or approaches would you propose to determine the relationship between contamination rates in FSIS-regulated foods and food-related human illness (e.g., expert elicitation, risk assessment, etc.)?

Questions

3. Do you have any suggestions to directly link FSIS inspection activities to changes in the incidence of food-related, microbial human illness, or are indirect linkages most appropriate?

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