



Food Safety

- Major force in restructuring food system:
 - Emphasis on traceability
 - Calls for Country of Origin Labeling
- Recent concerns
 - Globalization and potentially weak standards—
e.g., with Chinese products
 - Bacterial contamination
 - Mad Cow Disease
 - Potential risks with GMOs?
 - Obesity



Food Safety

- Types of Food Safety Problems
 - Options for Regulating Them
 - Implications of Food Safety Regulation for System Structure and Performance
- How Risky is Our Food?
- Why Get the Government Involved?
 - Supply and Demand for Food Safety
 - Missing Markets?
- How Do You Decide How Much to Invest in Food Safety, How and Where?



Types of Food Safety Problems: Each Regulated Differently

- How Safe is Food to Produce?
- Chronic Health Problems Due to Poor Diet
- “Contaminants” – The “classical” food safety issue



Let the market take care of it....

- ✓ Hayek argues that markets are extremely efficient ways of organizing economic activity because they effectively synthesize lots of highly dispersed information regarding consumers’ desires and producers costs and express that information in prices.
 - ✓ Are Hayek’s arguments valid for dealing with food safety issues like Mad Cow Disease and potentially contaminated imports? Why or why not? What alternatives do you suggest?

Nutritional Food Safety

- ✓ Chronic Health Issues – Nutrient/Diet Composition
 - ✓ High fat
 - ✓ High sugar
 - ✓ Low fiber
 - ✓ Nutritional deficiency
 - ✓ Alcohol/Tobacco overconsumption
- ✓ Is this a public policy concern?



Annual Costs Associated with the Unsafe Consumption of Food, U.S., 2000-2002

Health Care Problem Type	Health Care Costs	
Deaths		
Microbial*	\$6.9- \$33 billion	2,654-5,000
Antibiotic resistant infections**	\$30 billion	NA
Obesity***	\$93 - \$125 billion	400,000
Diabetes-type 2	\$32 billion	

■ Ratio of Obesity costs to Microbial costs

- $93/6.9 = 13.5$
- $125/33 = 3.0$
- $400/5 = 80$

*Estimated cost based on four types of microbes: Campylobacter, Salmonella, E.-coli, Listeria <http://www.ers.usda.gov>

**Todd, Ag.Outlook Forum, 2003

Kinsey, 2004

*** Direct and Indirect Costs: www.cdc.gov/diabetes/pubs/estimates.htm

French Fries and Food Safety: McDonald's Obesity Suit

- ✓ Does Society:
 - ✓ Provide public information about the relationship between high levels of fat consumption and disease?
 - ✓ Require labeling stating that high levels of consumption are hazardous to your health?
 - ✓ Regulate the level of fat allowed in french fries?
 - ✓ Tax calories?



Federally Informed Diets

- ✓ U.S. key strategy has been information provision or control
 - ✓ Consumer education
 - ✓ Content labeling
 - ✓ Warning labels
 - ✓ Advertising restrictions
 - ✓ Where is Joe Camel?
- ✓ How much action is enough?
- ✓ Will market forces contribute to good eating habits? Initiatives by fast food companies, insurance companies?





Types of Food Contaminants: Chemicals

- Intentional Poisoning – Bioterrorism
- Allergens – e.g., introduced via bio-engineering
- Pesticides
- Animal drugs
- Environmental contaminants
- Food Additives



Types of Food Contaminants: Biological

- Bacteria
- Fungi
- Viruses
- Prions
- Toxins
- Parasites



Growing importance of biological contaminants

- Resistant strains of bacteria
- Discovery of new types of pathogens
- Increased away-from-home food preparation and international trade & greater scale of food processing operations
 - Less direct consumer control of food quality
 - Wider exposure to incidents of contamination

Biological Contaminants: What's the risk?

Foodborne illness in U.S. meat consumption:

- 1 in 5 million meals of fish
- 1 in 200,000 meals of beef
- 1 in 20,000 meals of poultry
- 1 in 250 meals of shellfish



Determinants of the demand for food safety

- Income
- Information/knowledge/perception
- Other factors?



Supply of Food Safety

- Perceived willingness to pay
- Rise of certification programs
- Problems of information asymmetry and attribution
- Who has incentive to fully reveal information?
- Problems of consumers capacity to process information.



Profits for Innovators

- **Texas American**, hamburger patty supplier
 - Switched from spot market to contract sales
 - Fewer product returns and customer complaints
 - Cheaper production costs
 - schedule workers and equipment use better
 - less product spoilage

- **Jack in the Box** became channel captain for meat industry on pathogen control
 - Avoided bankruptcy in 1993
 - Expanding stores, sales, and profits today

www.ers.usda.gov/publications/aer831/

Roberts, ERS, 2004

Economics of New Tests

(Roberts and Unevher)

- In 1990, limited information about pathogens in food
 - High cost, time to result, lack of specificity, etc.
 - Where do they enter food chain? Where do they grow?

- Source of market failure
 - Limited ability to monitor pathogens

- New testing technologies available to reduce market failure

Roberts, ERS, 2004



Supply of information

Advances in pathogen testing

- Tests for more pathogens
- Faster results - 1-2 days
- Sensitivity– can detect low levels
- Specificity– identify specific strain
- Test for several pathogens with one sample
- Fewer false positives/negatives
- Quantify pathogens

Automated record keeping and analysis

Roberts, ERS, 2004



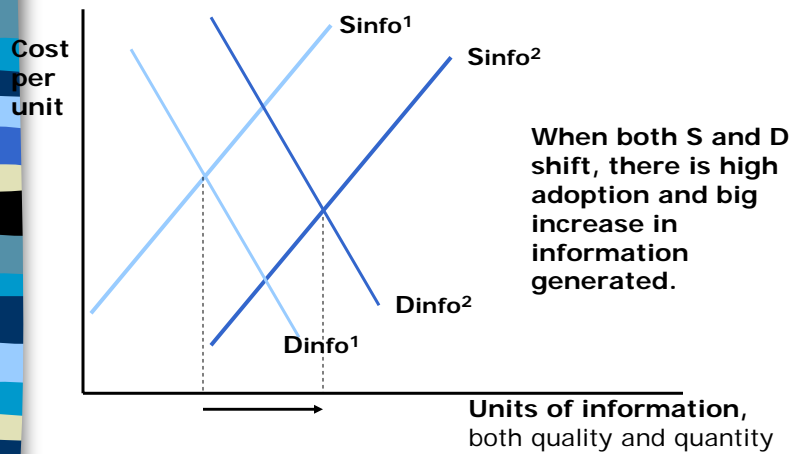
Demand for Information

Increased value in last decade

- New FSIS regulations (PR/HACCP)
 - Require *Salmonella*, generic *E. coli* tests
- Increased risk aversion among buyers
 - More publicly available information
 - More outbreaks detected with FoodNet
 - Private contracts can require tests
- Increased international trade of meat and poultry products

Roberts, ERS, 2004

Combined Supply and Demand shifts lead to more information use



Roberts, ERS, 2004

Value of information to regulators

Set product standards rather than process standards

- Less cost if firms can adapt and innovate
- HACCP – Hazard Analysis Critical Control Point

Verify process standards when product standards impractical

Establish equivalence of differing regulations in international trade

Meeting Customer Needs: Creekstone Farms' Battle with USDA

- Petitioned USDA to allow private testing for BSE (Feb 19, 2004)
- Market driven decision
 - Open Japan's market (and others) to Creekstone product
 - Meet customer's need by testing every animal
 - Kansas Secretary of Agriculture: Testing every animal adds value to their product.... should be able to employ appropriate marketing strategy is appropriate for them. (Kansas City Star, April 13, 2004)
- USDA's Answer: NO! (April 12, 2004)
 - USDA will continue to negotiate with the Japanese RE: U.S. beef exports
 - BSE testing of younger animals is not scientifically justified or necessary (have budged on this a bit).
 - "need sense of unity when addressing trading partner concerns"
- Opponents: Costs of testing eventually passed to producers, up to \$20 per calf
- March 26, 2006: Creekstone lawsuit.."USDA overstepped its legal authority...acted as "a roadblock" to Creekstone's efforts to satisfy customer needs"

Food Safety and Market Failure

Food safety primarily a credence good

- Cannot observe quality of good
- not a search good (quality determined before purchase)
- only limited experience good

Main information problem


- linking illness to food consumed

Now---Improved testing

Drivers for private food safety innovations

New pathogen testing technologies

www.ers.usda.gov/publications/aer799/



How Do You Decide How Much to Invest in Food Safety, How and Where?

- How to estimate costs and benefits?
 - USDA estimates costs at \$6.8 billion/year for 5 major contaminants
 - Lost wages; valuing lost lives.
 - [USDA cost calculator](#)
- Uncertainty



Useful Websites on Food Safety

- <http://www.ers.usda.gov/publications/aer799>
- www.ers.usda.gov/Data/Foodborneillness
- www.ers.usda.gov/Emphases/SafeFood
- http://www.michigan.gov/mda/0,1607,7-125-1568_21390-53829--,00.html
- www.ers.usda.gov/Data/HACCPsurvey/
- <http://www.foodsafetynetwork.ca/>
- <http://www.cdc.gov/foodnet/>