**From the Headlines…**

- Fresh Food Concepts Recalls Guacamole Products…Possible Health Risk (Feb. 04)
- Edy’s Peanut Butter Cup Ice Cream contains undeclared peanuts…(March 2004)
- Sara Lee pleads guilty in recall (July 2001)
  - Listeria outbreak of 1998
  - Bil-Mar Foods, Western Michigan

**From the Headlines…**

- StarLink Contamination of White Corn Chips Prompts Food Recall (July 2001)
- Experts seek ways to protect nation’s food supply from bioterrorism(April 2003)
- Mad Cow Disease Hits U.S. (December 2003)

**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? Why or why not? What alternatives do you suggest?
No Big Deal?

- Estimates are that fewer than 300 people in the world have died from the human equivalent of Mad Cow Disease over the past 10 years. The US Center for Disease Control and Prevention estimates that annual deaths from food poisoning in the US are between 5,000 and 9,000.
- Has the emphasis on the risk of Mad Cow disease been disproportionate relative to other health risks from food? Why or why not?

How Much is it Worth?

- Resources have opportunity costs for society. They can be used to fund other public health programs (e.g., childhood vaccinations), education, transportation, pollution control, etc.
- How would you go about thinking about how much we should invest to reduce the risk of Mad Cow disease?
- Or other food borne illnesses?

Where are we headed?

- Types of Food Safety Problems
- Relative Risks
- Is this the market’s problem to solve or the public sector’s problem to solve?
- Whose Standards?
- A public policy perspective
Food for Thought

✓ What kind of economic good is food safety?
✓ Has the nature of food safety concerns evolved?
✓ Does Society seek to control only ACUTE food related illness in monitoring and regulating food markets or does Society also concern itself with CHRONIC food related illness?
✓ Should food safety policies be uniform across all foods?

What is Food Safety?

✓ Safe Food: Maintains or Improves Health
✓ Unsafe Food
  ❖ Negative Acute or Chronic Health Impacts:
    • Ingesting a fast acting poison - acute
    • Substances that debilitate the body over the long run - chronic

Sources of Unsafe Food Consumption

1. Known: Short term illness/death: Microbes, poisons
2. Uncertain: Long term harm/shorter life: Pesticides, BSE, additives, hormones (eg rBst)
3. Unknown but suspected long term harm: GMO, Irradiation
4. Known: Substances and life styles that lead to chronic disease: diabetes, cancer, heart disease
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

<table>
<thead>
<tr>
<th>Health Care Problem Type</th>
<th>Health Care Costs</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microbial*</td>
<td>$6.9-$33 billion</td>
<td>2,654-5,000</td>
</tr>
<tr>
<td>Antibiotic resistant infections**</td>
<td>$30 billion</td>
<td>NA</td>
</tr>
<tr>
<td>Obesity***</td>
<td>$93-$125 billion</td>
<td>400,000</td>
</tr>
<tr>
<td>Diabetes-type 2</td>
<td>$32 billion</td>
<td></td>
</tr>
</tbody>
</table>

- Ratio of Obesity costs to Microbial costs
  - 93/6.9 = 13.5
  - 125/33 = 3.8
  - 400/5 = 80

**Todd, Ag Outlook Forum, 2003
***Direct and Indirect Costs [www.cdc.gov/diabetes/pubs/estimates.htm]
Kinsey, 2004

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
  ✓ Put Label on French Fries stating that high levels of consumption are hazardous to your health
  ✓ Regulate the level of fat allowed in french fries
**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?

---

**Food Safety: Controlling Contaminants**

**Chemical Contaminants**

- Pesticides
- Drugs
- Additives
- Environmental

---

**Biological Contaminants**

- Microbial/biological contaminants
  - Bacteria
  - Fungi
  - Viruses
  - Prions (don’t carry DNA)—e.g., mad cow disease
  - Toxins
  - Parasites—e.g., tapeworms
- Becoming more important due to:
  - Resistant strains of bacterial pathogens
  - Discovering new varieties of pathogens
  - With increased international trade, more pathogens are being spread to more people.
**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

---

**Does the Market Provide Adequate Food Safety?**

- **Market incentives** to produce safer food
  - Premiums for certain kinds of food safety
  - Avoidance of losing customer goodwill in others
  - Requirements of trading partners/supply chain
- **Pressure for Traceability**
  - Marketable to customers
  - Rapid containment or elimination
  - Accountability
  - Evolution of technology (EX: RFID cattle tags)
- **Still a Role for Government?**

---

**Technological Innovation: The Bacterial Pathogen Sampling & Testing Program**

- **Driver**
  - 1993 outbreak, *E. coli* O157:H7 in Jack in the Box hamburgers
    - 4 children died, over 800 persons ill
- **Jack in the Box acted quickly**
  - Hired a new vice president for food safety
  - Cancelled all contracts with hamburger suppliers
  - Set new process controls, testing requirements, invited bidders
- **2 hamburger patty suppliers responded**
  - Texas American Foodservices Corp. developed Bacterial Pathogen Sampling & Testing Program (BPSTP)
  - Worked to improve both testing process and test technology

Roberts, ERS 2004
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

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

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

Source: 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

Source: 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 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

Value of information to regulators

• Set product standards rather than process standards
  – Less cost if firms can adapt and innovate
• Verify process standards when product standards impractical
• Establish equivalence of differing regulations in international trade

Roberts, ERS, 2004
Use of tests in trade disputes

- *Salmonella* in U.S. poultry to Eastern Europe
  - Import standards consistent with domestic standards?

- *Cyclospora* on Guatemalan raspberries to U.S.
  - New certification system relies on public/private monitoring of processes and tests, incl. soil & water

- Equivalence guidelines development part of Doha implementation agreements
  - Role for tests?

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
  - Willingness to work with test developers to increase speed of test results
  - Kansas Secretary of Agriculture: Testing every animal adds value to their product, and they should be able to employ whatever 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 and other export countries to reinstate U.S. beef exports
  - BSE testing of younger animals, such as those processed by Creekstone Farms is not scientifically justified or necessary.
  - “need a sense of unity when addressing the concerns of our trading partners,”

- Some opponents fear the costs of testing every animal might eventually be passed down to producers, reducing the value of calves as much as $20 a head.

Food Safety Policy Depends on Nature of the Risk

<table>
<thead>
<tr>
<th>Continuum of Food Attributes</th>
<th>Ingredients, price, taste, color, origin, calories, size, shape</th>
<th>Pesticide residues, radiation, contamination, hormones, allergens, antibiotics</th>
<th>Bacterial pathogens, toxins, including carcinogens</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Policy: Set criteria and standards for products and processes</td>
<td>Policy: Set strict rules and monitor outcomes and penalize firms with unsafe food</td>
<td>Ban Product</td>
</tr>
<tr>
<td></td>
<td>Trade or information</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---
Evolution of Food Safety

- Traditional definition is evolving …
- Relationship to Overall Healthfulness
  - Negative (contaminants)
  - Positive (nutrient related)
  - Short term
  - Long term
- Protection from Intentional Tampering
  - Bioterrorism

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

Safe Food Consumption is a Public Good

Healthy People = healthy, productive economy

Role of Government = right combination of policies and practices that deliver the optimum level of safe food Consumption - in their economy and culture.

Policy Choice - depends on specific risks associated with specific food

Role of economist – find optimum investment to ensure healthy & safe food consumption.
Useful Websites on Food Safety

- www.ers.usda.gov/Data/FoodborneIllness
- www.ers.usda.gov/Emphases/SafeFood
- http://www.michigan.gov/mda/0,1607,7-125-1568_21390-52829--,00.html
- www.ers.usda.gov/Data/HACCPSurvey/
- http://www.foodsafetynetwork.ca/
- http://www.cdc.gov/foodnet/