Emerging Issues/Global Markets

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Outline of the Presentation

- Increased trends in foodborne disease cases
- Examples of foodborne hazards
- Trade agreements impacting on food safety
- Global food trade/food safety issues: Africa as an example
- Food safety: a challenge for government
- New approaches to control of foodborne disease
Increased Trends in Foodborne Disease Cases
Increased Trends in Foodborne Disease Cases

- Increased population growth
- More people susceptible to foodborne disease
- Urbanization
- International trade
- Changes in world trade
- Changing food production technology
- More foodborne hazards identified
Susceptible Populations

- More people susceptible to foodborne disease
- Better health care to help those with disabilities survive and live longer
- Surgery can remove organs or medical treatment that affects them so that there are fewer barriers to infection
- Increased use of immunosuppressant agents
- Increasing aging population, more in the >65 category
- Increase in infectious diseases like AIDS with patients living longer
Urbanization

• Crowding of people with increased risk of disease transmission
• Public health infrastructure often does not keep up with the pace of urban growth
• More rural people seeking employment in cities with understanding how to live successfully in an urban environment
• Rapidly growing cities create ghettos, ethnic communities and often poverty
• Lack of understanding how food is produced and delivered
Urbanization

• Longer farm-to-fork food chain
• More meals away from home
• Limited commitment to home food preparation (more working women, single parent families, families less likely to eat common meals)
• A busy society, e.g., less time devoted to hygiene like thorough hand washing and drying
Urbanization

- Street-vended and convenience foods
- More opportunities for contamination, growth and survival of pathogens
- Growth of small local food industries
- Cities are where immigrants cluster and enter into low paying food industry jobs
- Small urban food operations tend to be managed by people with minimum food safety knowledge, with problems of multiple food cultures and multiple language use, and avoidance of government control
International Trade

• Increasing trade for food and feed between countries
• More people are traveling with the potential to spread communicable diseases over wider areas
• More demand for different food varieties including ethnic and unusual niche products
Changes in World Trade

• Widespread acceptance of the liberal model of world trade
• The creation of the World Trade Organization
• Rapid economic concentration in the global supermarket sector
• Growth of supermarket chains in developing nations
• Several widespread high publicity food safety failures and scares
• Dietary shifts in industrialized nations and in the middle class of developing nations
Changing Food Production Technology

• Trend towards larger production of the products in fewer facilities (large companies, multinational corporations)
• More equipment and fewer people
• Food lines used for more than one product with the potential for contamination
• Industrialization of animal production with risks for more antibiotic use, subclinically infected animals, risks of contamination from higher throughput at the slaughterhouse
Increasing GI Illnesses in US Projected

• 20% decrease in foodborne disease caused by pathogens
• Anticipates a 10-15% increase during the next decade (Brief for 107th Congress)
Increasing GI Deaths in US

- Deaths listed on death certificates (Peterson and Calderon, Am. J. Epi, 2003)
  - 1989: 0.14% deaths associated with GI
  - 1996: 0.37% deaths associated with GI
  - Men and women over age 65
  - Viral enteric diseases in 35 to 55 age range (AIDS related?)
  - More non-white Americans died from GI than whites

- Summary: more low immunity and aging increasing death rate
Examples of Foodborne Hazards
Foodborne Hazards

- More difficult to link hazards and food-related illnesses if there are long incubation periods and multiple agents that could cause the same effect
- Most scientists and governments consider microbiological hazards to be of most concern
- Public perception may differ from this, especially as in the past chemical use was regulated because of potential health concerns
Rapid Spread of Pathogens

- Yersinia enterocolitica in pigs in the 1970s
- Salmonella Enteritidis in poultry and egg-associated outbreaks in the 1980s
- Salmonella DT 104 in Europe and North America associated with cattle and humans in the 1990s
- Cholera as a pandemic sweeping Latin America in the 1990s
Increasing Antibiotic Resistance from Animal Use

- Fluoroquinolone use in poultry leads to more Campylobacter resistant strains
- Salmonella Typhimurium DT 104: resistant to 7 antimicrobials (found in poultry, sheep, pigs, and horses)
- Feedlot cattle in US: 21.7% of Salmonella isolates were resistant to tetracycline, non-feedlot cattle 11.2% (Beach et al, 2002)
- Infections caused by resistant microbes fail to respond to treatment, resulting in prolonged illness and greater risk of death
Increasing Antibiotic Resistance from Animal Use

• CDC estimates that some 50 million of the 150 million outpatient prescriptions for antibiotics every year are unneeded
• Residents in and visitors to developing countries acquire antibiotic-resistant E. coli as part of their normal flora
• Plasmids are shown to be transferred from the donor E. coli strain to E. coli O157:H7 in both broth and rumen fluid
• Institute of Medicine estimates cost of treating antibiotic resistant infections in the US may be as high as $30 billion/year
Developing Countries

- 1.5 billion episodes of diarrhea and 3 million associated deaths every year in children under 5
- Up to 10% of populations may suffer foodborne diseases annually
- Excessive or illegal use of additives may contribute to the risk of illness
- Over use of multiple pesticides and antibiotics (direct food contamination and environmental contamination)
- These also have trade implications with likelihood of contaminants in food, and rejection if the exported food is analyzed
Foodborne Disease in China
(State Info, Feb 9, 2003)

• 7127 cases and 138 deaths in 2002
• Decrease from 2001
• Dining halls the location of most cases
• Number of reported foodborne disease cases in US somewhat higher but estimates are 76 million annually
• Population differences: 280 million (US) vs. 1240 million (China)
• All this indicates considerable underreporting of foodborne disease in China
Trade Agreements Impacting on Food Safety
Trade Agreements

• Joint FAO/WHO Codex Alimentarius Commission (CAC) was established in 1962 to protect the health of the consumer and ensure fair trade practices

• The CAC includes provisions for food hygiene, food additives, pesticide residues, contaminants, labeling and methods for analysis and sampling
Trade Agreements

• Solutions for potential chemical problems are addressed by long term committees like JECFA (Joint FAO/WHO Expert committee on Food Additives and Contaminants)
• Only recently have microbiological issues been addressed with the establishment of JEMRA (Joint FAO/WHO Expert committee on Microbiological Risk Assessment)
• The World Trade Organization was established in 1995 to govern international trade through agreements with member countries
Trade Agreements

• These agreements include the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) and the Agreement on Technical Barriers to Trade (TBT)
• HACCP is considered to be an essential part of national food safety polices with involvement of government, industry and consumers
• National standards stricter than the CAC standards need to be scientifically justified through risk analysis (risk assessment, risk management, risk communication)
• JECFA and JEMRA use risk analysis approaches
Global Food Trade/Food Safety Issues: Africa as an Example
Problems in Africa: World Food Summit in Rome, June 2002

• In 2002 815 million hungry people
• 13 million people are facing famine in southern Africa, about 15 million Horn of Africa
• Factors identified: drought, poverty, AIDS, armed conflict, corruption and the mismanagement of food supplies, food distribution failures, environmental degradation, malnutrition
Problems in Africa: World Food Summit in Rome, June 2002

- Zambia bans GM maize totally
- Zimbabwe, Mozambique and Malawi accept milled GM maize only
- Angola, Lesotho and Swaziland have not adopted positions on GM but have not refused aid containing GM food
- UN Secretary General Kofi Annan called for greater access to land, credit, markets and technology for the world's farmers
Problems in Africa: World Food Summit in Rome, June 2002

• Ugandan President Yoweri Museveni: “The main causes of food shortages in the world are: war, protectionism in agricultural products in Europe, USA, China, India and Japan, and protectionism in value added products on the part of the same countries”

• Many protesters echoed the message of French farmer and anti-globalization activist Jose Bove: “GMOs (genetically modified organisms) are no answer to hunger. It is just that big multinationals want to control all the rights to seeds.”
Problems in Africa: World Food Summit in Rome, June 2002

• The EU policy to ban the importation of GM food from the US, and in conflict with WTO
• The concern in Africa was that some of the American corn might mix with some African corn and that the Europeans would then refuse to import the African corn.
• The US is stalling to take action because it would hinder Europe’s cooperation in any action against Iraq
Some Factors Influencing Consumer Perceptions about Food Safety

• Economic and political status of a country, e.g., poor, low education, malnourished, disease ravaged, internal strife/civil war, totalitarian regime, controlled media vs. rich, well-informed, well-traveled population, democratic government, free press

• National or regional culture (mind your own business attitude, accepting authoritative action vs. in your face attitudes, challenging authority)

• Government policies in promoting food safety over many years, or a low priority
Food Safety: A Challenge to Government
Uncertain Value of Inspection to Reduce Foodborne Illness: Inability to Detect a Problem

- In Hamilton, Ontario, in January 2003, food inspectors gave the Polish Alliance Hall their seal of approval two days before an outbreak of E. coli affected 55/225 people who attended a social event there (The Spectator, Jan 29, 2003)
- Reheated haggis was the suspected food
- Inspectors rechecked the building again and found no health violations on the premises
- The Hall was previously inspected in February 2002 and no violations found
Uncertain Value of Inspection to Reduce Foodborne Illness: Restriction on Enforcement

- Federal District Court recently blocked efforts by USDA to shut down a midwestern meat plant where E. coli O157:H7 had been found.
- Apparent need for strong legislative action clarifying the government's power to enforce safety standards.
School Meals and Irradiation

- The rate of illnesses from E. coli fell 21%, Salmonella 15% and Listeria 35% from 1996 to 2001
- But school-related foodborne outbreaks are rising 10% a year (GAO) – real data or better reporting?
- In 1997, more than 300 children in 5 states became ill after eating strawberries harvested in Mexico and processed in California
- In 1998, burritos produced in Chicago affected 1,200 children nationwide
- 27 million meals are served in schools each day
- Irradiation of school meals a realistic scenario
First World Congress on Food Irradiation

• Chicago, May 5-7, 2003 in conjunction with the FMI Show

• Register on line at:
  www.foodsafe.msu.edu/Congress/congress.html
New Approaches to Control of Foodborne Disease
New Approaches to Food Control Programs

- Canada, UK, Ireland and the Netherlands have revised their food control systems
  - They recognized the need for new legislation
  - Establishment of a central food control agency
  - Programs include HACCP systems
- Incorporating risk analysis into programs to maximize their resources to reduce foodborne illnesses.
- A focus on achievable public health goals to reduce disease not necessarily detecting contaminants and microorganisms
New Approaches to Food Control Programs

• The EU is in the process of completing its revision
• The US has done much the same but has not created a single control body to date
New Areas Impacting Food Safety Strategies

• Social dimensions of food safety increasing in importance along with microbiology, toxicology and epidemiology
• Risk analysis (risk management, risk assessment, risk communication, risk perception) integrating seamlessly into policy
• More concrete linkages between government policy and reduction of illness
New Areas Impacting Food Safety Strategies

- More cooperation between government, industry and academia to solve farm to fork problems
- Looking at the big picture, e.g., food and health, climate change on globalization of the food supply, projecting baby boomer aging into increasing the risk of foodborne disease
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