Consumer Concerns About Foods And Water

Foodborne Illness

Leading cause of food contamination
Estimated 76 million people experience food borne illness annually, with 5000 deaths
Most vulnerable are pregnant women, children, elderly, those with weakened immune system

Foodborne Infections
Caused by eating foods contaminated by infectious microbes
Most common – Salmonella and Campylobacter jejuni
enter the GI tract in contaminated foods such as undercooked poultry, eggs, meats, unpasturized milk
symptoms include: nausea, vomiting, diarrhea, fever

Food Intoxications
Caused by eating foods that containing microbes that produce toxins
Most common are staphylococcus aureus and botulism
staph found in meats, poultry, picnic salads, cream filled pastry
botulism toxin found in improperly canned foods (meats, vegetables, oils)
difficulty seeing, speaking, swallowing, breathing
death can occur within 24 hours

Foodborne Illness

Food Safety in the Marketplace

Industry Controls
Pasteurization - heat processing which inactivates many of the microorganisms in food. Spoilage bacteria are still present.
Hazard Analysis Critical Control Points (HACCP) requires food manufacturers to identify points of contamination and implement controls.

Food Safety In
The Marketplace
Foodborne Illness
Food Safety in the Marketplace

Consumer Awareness
Wash hands with hot, soapy water before meals.
Expect clean tabletops, dinnerware, utensils, and food preparation sites.
Expect cooked foods to be served piping hot and salads to be fresh and cold.
Refrigerate carry-out foods within two hours.

Food Safety In
The Kitchen
Keep a clean, safe kitchen
Avoid cross-contamination
Keep raw meat, poultry, fish separate from all other foods
Wash all surfaces that have come in contact with them with warm, soapy, water
Wash your hands with warm water and soap for at least 20 seconds before preparing or eating food
How to Prevent Food Poisoning:
Keep a Clean Kitchen
How to Prevent Food Poisoning:
Keep Foods Hot
Food Safety In
The Kitchen
Keep hot foods
Cook hamburgers to 160 degrees
Keep cold foods cold
How Prevent Food Poisoning: Keep Foods Cold
Food Safety In The Kitchen
Safe Handling Instructions
This product was prepared from inspected and passes meat and/or poultry. Some food products may contain bacteria that can cause illness if the product is mishandled or cooked improperly. For your protection, follow these safe handling instructions.
Keep refrigerated or frozen.
Thaw in refrigerator or microwave.
Keep raw meat and poultry separate from other foods.
Wash working surfaces (including cutting boards), utensils, and hands after touching raw meat or poultry.
Cook thoroughly.
Keep hot foods hot.
Refrigerate leftover immediately or discard.
Recommended Safe Temperatures (Fahrenheit)
Foodborne Illness
Food Safety in the Kitchen
Mad Cow Disease
Can cause neurological damage to cows and humans
Ground beef and sausage are more of a concern.
Wild game may also be a danger
Avian influenza is normally found in chickens, ducks, and turkeys.
Possible human infection
May be contracted by having contact with birds, not by consuming them.
“Swine Flu” (H1N1) is not caused by eating pork
Foodborne Illness
Food Safety in the Kitchen
Safe Handling of Seafood
Undercooked or raw seafood can cause problems such as hepatitis, worms, parasites, viruses and other diseases.
Sushi may contain raw or cooked ingredients.
Raw oysters may be a concern.  
Water pollution must be controlled.  
Processing facilities must be clean, and temperatures should be controlled.  

Foodborne Illness  
Food Safety in the Kitchen  
Other Precautions and Procedures  
Abnormal odors with seafood – should smell fresh  
Be mindful of safe refrigeration temperatures (≤40°F) and storage times.  
Foods most commonly implicated in foodborne illnesses  
Frequently unsafe  
Raw milk and milk products  
Raw or undercooked seafood, meat, poultry, and eggs  
Raw sprouts and scallions  

Foodborne Illness  
Occasionally unsafe  
Soft cheeses  
Salad bar items  
Unwashed berries and grapes  
Sandwiches  
Hamburgers  
Rarely unsafe  
Peeled fruit  
High-sugar foods  
Steaming-hot foods  

Safe Refrigerator Storage Times  
Prevent Food-Borne Illness While Traveling  
Traveler’s Diarrhea  
Other countries may have lower cleanliness standards for food and water  
Other countries have different microbes  
50-50 chance of catching “travelers’ diarrhea” caused by E. Coli, Shigella, Salmonella  
Symptoms include nausea, vomiting and diarrhea  
“Boil it, cook it, peel it or forget it”  

Foodborne Illness  
Food Safety While Traveling  
How to achieve food safety while traveling  
Wash hands. Use antiseptic wipes or hand gels.  
Eat only well cooked and hot foods.  
Wash fruits and vegetables in purified water and peel.  
Use bottled water.  
Drink only treated, boiled, canned, or bottled beverages, consumed without ice.  
Refuse dairy products unless properly pasteurized and refrigerated.  
Do not purchase foods or drinks from street vendors.
Take antimotility and antibiotic agents prescribed by a physician, if necessary.

Foodborne Illness

Advances in Food Safety

Irradiation

Protection

Controlling molds in grains

Sterilizing spices and teas for storage at room temperature

Controlling insects and extending shelf life in fruits and vegetables

Destroying harmful bacteria in fresh and frozen beef, poultry, lamb and pork

Ultrahigh temperature (UHT) treatment

brief exposure to high temperatures

Advances In

Food Safety

Irradiation

Controls mold, insects, bacteria

Consumer concerns about irradiation

Regulation of irradiation

FDA regulates that foods that have been treated must say so on the label

Nutritional Adequacy Of Foods And Diets

Minimizing nutrient loss

Refrigerate prior to use

Store cut fruits and veggies in airtight containers and refrigerate

Wash before cutting

Steam or microwave

Environmental Contaminants

Harmfulness of Environmental Contaminants

Depends on its persistence

Each level of the food chain has a greater concentration then the one below, known as bioaccumulation.

Heavy metals and organic halogens can enter the food supply.

Bioaccumulation

Environmental Contaminants

Harmfulness of Environmental Contaminants

Methylmercury

Can result in blindness, deafness, and lack of coordination, affects the intellect, and can cause death

Fish can become contaminated with methylmercury.

Infants born to pregnant women who consume methylmercury can be affected.

Harmfulness of Environmental Contaminants

Methylmercury

Avoid shark, swordfish, king mackerel and tilefish

Limit other fish to 12 ounces/week

6 oz white albacore tuna

Fish high in omega-3 fatty acids and low in mercury
Salmon, herring, sardines, lake trout, shad, mackerel, whitefish, flounder/sole, pollock

Environmental Contaminants

Harmfulness of Environmental Contaminants

PBB and PCB

Polybrominated biphenyl (PBB) was mixed with livestock feed in Michigan and caused nervous system problems and liver disorders in those who consumed the meat of the livestock.

Polychlorinated biphenyls (PCB) were found in rice oil in Taiwan and resulted in fertility problems in men and women who had children with developmental issues.

Natural Toxicants

Poisonous Mushrooms

Goitrogens-can enlarge the thyroid gland.

Found in cabbage, brussel sprouts, cauliflower, broccoli, radishes.

Cyanogens-can produce cyanide upon activation by a specific plant enzyme.

Found in lima beans, fruit seeds

Solanine-narcotic; toxic in large quantities

Found in the green layer under the skin of potatoes

Due to improper storage in light, very cold, or very warm environment

Pesticides

Hazards:

Children, elderly and those with compromised immune function are at risk.

Regulation:

EPA establishes tolerance level

Max amount of residue permitted when food used according to label.

Set well below level of harm

FDA monitors foods and livestock.

Pesticides from Other Countries:

Standards and inconsistent with U.S. standards.

Pesticides

Consumer Concerns

Minimizing Risks

Trim fat and remove skin.

Select fruits and vegetables without holes.

Wash fresh produce with a scrub brush and rinse.

Use a knife to peel.

Discard outer leaves.

Peel waxed produce

Eat a variety of foods.

Consider buying certified organic foods.

Most and Least Pesticide-Contaminated Fruits and Vegetables

Consumer Concerns

Minimizing risks

Alternatives to pesticides
Organically grown crops

Food Additives
Many food additives used are preservatives.
The FDA regulates the use of intentional additives.

Regulations Governing Additives
The GRAS (generally recognized as safe) List
Additives that have been in use a long time such as salt, sugar, spices
Believed to be safe based on current scientific evidence
Ongoing review
Delaney Clause specifies that:
No substance that is known to cause cancer in animals or human at any dose level shall be added to food.

Food Additives

Margin of Safety
Zone between the concentration normally used and the amount which is hazardous.
Additives are permitted in foods at 100 times lower than the lowest level known to be harmful

Risk vs Benefit:
Benefit must outweigh the risk.
Additives cannot be used:
To disguise faulty products.
To deceive the consumer.
Where they destroy nutrients.
Where effect can be achieved via sound manufacturing process.

Intentional Food Additives

Antimicrobials:
Salt, sugar
Nitrites- preserve color, enhance flavor, protect against bacterial growth including botulism

Antioxidants:
Vitamins C & E
Sulfites (Salt with sulfur)
Destroy Thiamin
BHA, BHT- prevent rancidity in baked foods and snacks

Artificial Colors:
Blue, Red, Green & Yellow
Carotenoids - natural coloring

Intentional Food Additives

Artificial Flavors
MSG - monosodium glutamate

Texture and Stability:
Dextrin, Pectins
– Gums-Carrageen, guar, agar
– Yeast- thickening
Nutrients:
A, D, Thiamin, Riboflavin, Niacin, Iron, Folate, Iodide

Indirect Food Additives
Acrylamide-
Formed when high carbohydrate foods are cooked at high temperatures (french fries)

Microwave Packaging
Don’t reuse
Use glass or ceramic containers

Dioxins
Compounds formed during chlorine treatment of wood pulp in paper making (paper plates, coffee filters)

Decaffeinated coffee
Methylene chloride is used

Hormones
Bovine Growth Hormone (BGH)

Antibiotics—given to livestock; residues may remain in meat and milk

Consumer Concerns about Water
Water may contain infectious microorganisms, environmental contaminants, pesticide residues, and additives.
The EPA monitors the safety of public water systems.
Many consumers are choosing home water treatment systems or drinking bottled water.

Consumer Concerns about Water Sources of Drinking Water (potable water)
Surface water
Sources include lakes, rivers, and reservoirs.
Readily contaminated through acid rain, runoff from highways and urban areas, pesticide runoff from agricultural areas, and industrial wastes
Refreshed by fresh rain, aeration, sunlight, plants, and microorganisms

Consumer Concerns about Water Sources of Drinking Water Ground water
Sources include underground aquifers.
Supplies rural areas and pumped by wells
Contaminated more slowly but more permanently
Especially susceptible to contamination from hazardous waste sites, dumps, landfills, underground tanks storing gasoline and other chemicals, and improperly discarded household chemicals and solvents

Consumer Concerns about Water Water Systems and Regulations
Home Water Treatments
Shop carefully.
Advantages and disadvantages
Determine the quality of home water first.
Consumer Concerns about Water
Water Systems and Regulations
Bottled Water
FDA has quality and safety standards.
Expensive
Water source must be identified
Refrigerate after opening
May contain contaminants
End of Chapter 19
Consumer Concerns
Nitrosamine Formation