Chapter 13: Assuring a Safe Food Supply—From Farm to Fork

Categories of concern regarding food safety include:

(1) food allergies
(2) food intolerance
(3) food-borne illness

Food allergies are life-threatening illnesses. An example would be an allergy to peanuts. Food intolerances, such as lactose intolerance, may make you miserable but will not kill you.

Food-borne illnesses include:

(1) food infection ("food poisoning"), which results from eating food contaminated with living organisms; and (2) food intoxication, which results from eating food in which microbes have secreted toxins (poisons.)

There are more episodes of food poisoning than any other type of food contamination. Certain microbes are common pathogens in food including:

<table>
<thead>
<tr>
<th>Bacteria</th>
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<td>Viruses</td>
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<td>Fungus</td>
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<td>Protists</td>
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<td>Animals</td>
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Prevention of food-borne illnesses involves awareness of:

(1) safety in the marketplace
(2) safety in the kitchen
(3) safety while traveling

Years ago, people used drying, salting and application of spices to prolong the "shelf life" of their foods. Today these methods are available: salting and sugaring, drying, smoking, cooling, industrial canning, Pasteurization, Tyndallization and preservatives (such as BHA/BHT, propionic acid, sulfites, nitrates/nitrites, aseptic packaging, genetic modification and irradiation).

The GRAS List (1958) describes safe food additives and the Delaney Clause says that no potential carcinogens may be used as additives.

Food additives include: flavorings, colorings, nutrients (such as vitamins), texturizers, emulsifiers, stabilizers, humectants, bleaching agents, hormones and desiccants.
Toxins accumulate within the food chain. Environmental contamination of this sort is termed bioaccumulation. Examples include contamination by use of methyl mercury (1953, Minamata, Japan), PBB (1973, Michigan) and PCB.

Pesticides include DDT and malathion. Produce problems due to bioaccumulation.

Industrial pollutants include dioxins (side products of waste incineration) and PCB's (polychlorinated biphenyls; from discarded transformers). Biopesticides are used to minimize use of other organic chemicals, such as malathion.

There are two types of biopesticides: (1) biochemical pesticides (such as pheromones) and (2) microbial pesticides (such as the use of microbes to clean oil spills).

The market for organic foods is growing extremely rapidly. To a chemist, the term organic means "contains the element carbon", but to a nutritionist or everyday person, "organic" refers to foods grown without the use of hormones, pesticides and other chemicals. The USDA regulates organic farming the USA.

Discussion Topics/Questions:

Fish metal - p. 367
Agribusiness-feeding a growing nation or a corporate bad guy? - p. 372
Animal cloning-cruel and unsafe or agricultural advancement? - p. 375