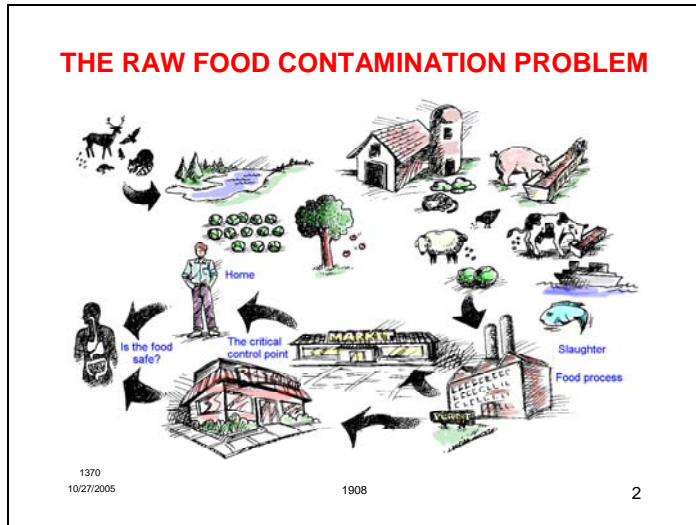


## SECTION 1



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### The Raw Food Contamination Problem

Unless the foodservice operator knows the actual food growing and processing conditions or buys certified safe products, incoming products must be considered contaminated with microorganisms and/or chemicals.

Streams, rivers, and lakes can become contaminated with pathogenic microorganisms (e.g., bacteria, viruses, protozoa, and parasitic larvae) and harmful chemicals such as mercury. This pathogenic material is then passed on to and by fish, animals, birds, rodents, insects, and humans. In turn, the pathogens are deposited in the soil in the form of human and animal waste. Plants and plant products grown in soil thus carry microorganisms of the environment from which they were produced.

A documented example of a contaminated raw product is that of raw cabbage as a source of *Listeria monocytogenes*. The cabbage had been fertilized with sheep manure from sheep infected with these pathogenic bacteria. The cabbage was grown, harvested, and was used to make coleslaw. People who consumed the coleslaw became ill with a "flu-like" illness. The illness had severe implications for pregnant women and their fetuses. The result was spontaneous abortions, stillbirths and babies born with symptoms of listeriosis.

There continue to be reports of *Escherichia coli* O157:H7 from consumption of raw or undercooked ground beef products, cider, apple juice, and well water. The source of these pathogenic bacteria is thought to be cattle. However, it is also found in wild animals. It is easily transferred between members of the same family and in day-care centers.

There are documented incidents of *Salmonella* spp. on the outside and interior of raw tomatoes, cantaloupe, and watermelon. *Shigella* spp. and *E. coli* on fresh lettuce have been found to be responsible for foodborne illness outbreaks. These incidents were traced to polluted irrigation water and failure of harvesting personnel to use or be provided with toilet facilities.

Raw poultry products are sources of *Salmonella* spp. and *Campylobacter jejuni*. Wild animals, horses, and pigs are carriers of *Trichinella spiralis* and other parasitic worms.

Raw milk products have been documented to be responsible for outbreaks of salmonellosis, listeriosis, and illness-caused *E. coli*.

All raw food must considered to be contaminated with pathogenic bacteria and possibly other harmful chemical compounds. Therefore, raw food must be prepared in ways that reduce and control the amount of contamination (or risk of contamination) to a safe level that can be consumed by people without causing illness.

## SELF-CONTROL (DUE DILIGENCE)

Driven by: lawyers, insurance companies, media

Can be used to prove that all reasonable precautions were exercised and all *due diligence* was taken to avoid the commission of an offense by management and employees.

**Taking all reasonable precautions** means setting up a pre-control / QA system to ensure that things do not go wrong. HACCP is an important component. Knowledgeable oversight and participation of top management are essential. Management must be able to say, "This food production operation is in control."

**Due diligence** means seeing that the system works properly at all levels, from the executive board level down to on-line employees. The system involves careful monitoring and recording at control points. There must be a system that strives for zero deviations using validated safe process procedures and standards. There must be pre-control.

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### Self-Control (Due Diligence)

When hazards are correctly identified and controlled it is possible for the owner of the retail establishment to have a defense of *due diligence* in case there is an alleged foodborne illness. Due diligence means that all reasonable precautions were exercised, and all due diligence was taken to avoid the commission of an offense by management and associates. Taking all reasonable precautions means setting up a system to ensure that things do not go wrong. HACCP is such a system.

**Due diligence** is the responsibility of the owner / operator / manager in terms of seeing that the system works properly from the executive board downward and involves careful monitoring and recording at control points. There must be a system for striving for zero defects. This can be accomplished when owners / operators / managers:

1. Have a written food safety policy that allocates responsibility to designated people and ensures that the policy is monitored and enforced.
2. Provide adequate training and written instructions related to the degree of hazard.
3. Assess the potential risk to the consumer and take appropriate precautions to include occasional laboratory checks
4. Design HACCP recipes for each menu item and validate that the recipe procedures will produce safe food using the ingredients being purchased.
5. Only buy from suppliers that exercise due diligence.
6. Have a fault-finding system to analyze consumer complaints and take suitable corrective action.
7. Use existing codes of good practice and improve on them.
8. Verify that each prevention / corrective system works effectively.
9. Make sure that the system is comprehensive.
10. Report and handle all staff illnesses according to written policy.
11. Have an emergency plan that, when all else fails, deals with consumer notification and/or product recall, when appropriate.

All personnel in a food production establishment should show that they have taken all precautions necessary and have used "due diligence" to produce safe food. If this is done, there is

little fear of lawsuits, high insurance claims, and adverse attention from newspapers, television and radio.

To achieve self-control (due diligence), all employees, supervisors, and managers must follow the four-step QA (Quality Assurance) cycle. This cycle consists of

1. Analyzing and planning.
2. Organizing and training.
3. Operating and exercising self-control to prevent foodborne illness
4. Measuring performance and making improvements.

For example, if a person does not know how to do a food preparation task safely, he or she will stop, ask, and then learn to do the task correctly. In performing tasks, each manager and employee will first plan and organize to do each task correctly. They will do the task according to specified procedures and standards. They will take necessary action immediately in case of a mistake to assure that customers or employees are not injured. If there is ever any doubt about the safety of a food item, it must be brought to the attention of the immediate supervisor.

Finally, if at any time there is a problem or an opportunity to improve, employees will inform the supervisor at the earliest opportunity. The objective of the self control (due diligence) is zero errors in operating procedures and the production of safe and consistent food products.

An operations manual that contains precise information about the system is required. This operating manual can be used as both a HACCP manual and a quality assurance manual to demonstrate self-control of safety and quality in retail foodservice and food production operations.

**HAZARD ANALYSIS-----HA**

**Hazards will always be present:**

- Biological
- Chemical
- Physical

**They are carried into the operation by:**

- Employees, customers, visitors
- Food and supplies
- Water and air
- Insects, rodents, birds

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## Hazard Analysis

HACCP (Hazard Analysis and Critical Control Points) is a scientifically correct way to study the safety of the food supply, food receiving and storage, food preparation, and food serving and leftover procedures and standards in retail food systems. Hazard analysis determines the biological, chemical, and physical hazards (hard foreign objects) and anticipates possible dangerous practices that may cause people to become ill. Controls are then developed that will assure that correct food handling procedures are used.

### Hazards present in food include:

- **Biological.** These include bacteria, molds, viruses, and parasites, from raw meat, poultry and fish and fresh produce.
- **Chemical.** Excessive amounts of pesticides may be present in some raw fruits and vegetables. Cleaning and insect control chemicals may be added to food accidentally in the foodservice operation. Culinary chemicals may be used in excess.
- **Physical.** Physical or hard foreign object hazards include rocks, bay leaves that never soften in cooking, metal cuttings from sharp can opener blades, and pieces of broken glass.

### Hazards are carried into the operation by:

- **Employees, customers, and visitors.** People bring in microorganisms on their hands; in their noses, ears, and mouths; and on their skin and clothing.
- **Incoming food and supplies.** Raw food carries many pathogens from growing and slaughtering operations.
- **Water.** Water processing plants (both municipal and bottled water operations) may not treat water adequately, thus allowing the presence of hazardous levels of pathogenic bacteria in the water supply. Many foodservice systems use well water that can become contaminated with animal and human fecal material.
- **Air.** The air carries many types of bacteria. Dust in the air can carry bacteria from farms and sewage treatment plants into food production facilities. When toilets are flushed, they aerosol fecal bacteria into the air of restrooms that will contaminate the air if there is not an effective exhaust system in the restroom. *Legionella* bacteria have been

found in poorly maintained air conditioner cooling towers and fresh vegetable water sprayers. *Listeria* spp., which is common to the soil, is often found on the floor and in floor drains. The air ducts have mold that blows down on the food and cause food to become toxic.

- **Insects, rodents, and birds.** These pests can carry pathogenic bacteria. In underdeveloped nations where there is very poor sewage control, these pests cause serious problems by transferring pathogens from raw sewage to food. In the United States the last recorded incident in foodservice due to flies occurred in 1945. (There have not been any due to rats or cockroaches.) The fly incident occurred in an Army camp during World War II when flies carried pathogenic bacteria from an open latrine pit to food. Today good sewage systems, coupled with American laws and technology, effectively control rodent and insect cross-contamination from sewage to food. The problem is not flies in the United States; it is customers who do not wash their hands and fingers properly before they touch food on display, on salad bars, or in any self-service situations in food markets where they can touch food.

**CRITICAL CONTROL POINTS-----CCP**  
**Prevent, eliminate, reduce hazard to a safe level.**

- Owner has absolute command and control of safety and written Policies, Procedures, and Standards
- Employees are trained and coached
- Adequate supply of material and time
- Adequate facilities and equipment
- Safety-assured recipe procedures
- Personal hygiene



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### Critical Controls

After food safety problems have been determined with hazard analysis, management must establish food handling policies, procedures, and standards for all employees that will control the hazards. Good controls are necessary because hazards are present most of the time on the food and in the people preparing the food. Only one foodborne illness incident can ruin a business financially. The following critical controls are necessary to assure food safety.

**Owner / manager control.** Owner(s) / manager(s) must know the hazards in the environment and the food and beverages being served. Owner(s) / manager(s) must develop and implement operating policies, procedures, and standards at the employee level that will control the contamination from the sources of supply and environment. Since the government's regulations do not provide complete hazard and control information, the manager must get this information for himself.

**Employee training.** Owner(s) / manager(s) must have a training and reinforcement program that trains employees how to do their jobs safely before they are asked to do them.

**Adequate supplies and time.** Owners and managers must provide the supplies, equipment, and time necessary for the employee to do his/her tasks safely with zero defects. This includes providing soap and fingernail brushes at hand sinks as well as cleaning chemicals, scrub brushes, and sanitizers for food contact surfaces such as cutting boards and knives.

**Adequate facilities and equipment.** There must be adequate refrigeration capacity to keep refrigerator temperatures at 41°F when hot food is cooled. The temperatures of food in walk-in and reach-in refrigeration units, and cold food preparation tables must stay at 41°F during all operating times.

**Safety-assured recipe procedures.** Food preparation times and temperatures must be specified for each recipe in order to assure the reduction of the pathogens to a safe level and prevent the dangerous multiplication of pathogenic microorganisms in food products. The use of chemical additives such as monosodium glutamate must be properly controlled through recipe standardization.

**Personal hygiene.** All foodservice employees must assume that they are shedding pathogens in their feces all of the time. To ensure safe food handling, each employee must wash his/her fingertips after using the toilet by using the double hand washing method that requires a lot of hot water, soap, and a fingernail brush. Good personal hygiene also includes the use of hair restraints, clean uniforms, personal cleanliness, and good grooming. These factors do not ensure the safety of food but are critical to customer satisfaction and perceived safety. The established and enforced use of good personal hygiene by all employees demonstrates that management has command and control of the foodservice operation.