

FOOD SAFETY EDUCATION CERTIFICATION

Keep your customers
happy and healthy

Training provided by:

New York State Association of Service Stations & Repair Shops, Inc.

LESSON PLAN

1. The Health Inspection
2. Food Microbiology and Foodborne Illnesses
3. The HACCP System
4. Cleaning and Sanitation
5. Personal Hygiene
6. Temperature Control
7. Food Security
8. Pest Control

THE HEALTH INSPECTION



Food Safety

CRITICAL DEFICIENCIES

1. FOOD RECEIVED FROM UNAPPROVED SOURCES

- a. Unpasteurized Products**
- b. Foods or Ingredient**
- c. Water or Ice from Non-potable Sources**
- d. Egg Products - Liquid or Frozen**
- e. Dried Milk Products Not from U.S.D.A.**

Inspection Plates

- f. Shellfish from Unapproved Sources**



2. Unfit/Adulterated Food Products or Ingredients

a. Rodents

b. Insects

c. Unapproved Additives

d. Other

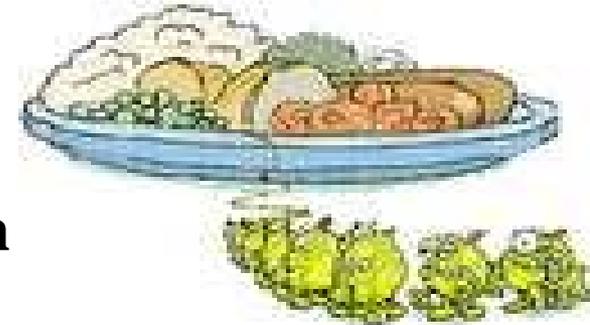


3. Food Contaminated by Workers

- a. Sick with a disease that transmissible to food**
- b. Infected cuts or sores**
- c. unwashed hands**
- d. Ready to eat food exposed**

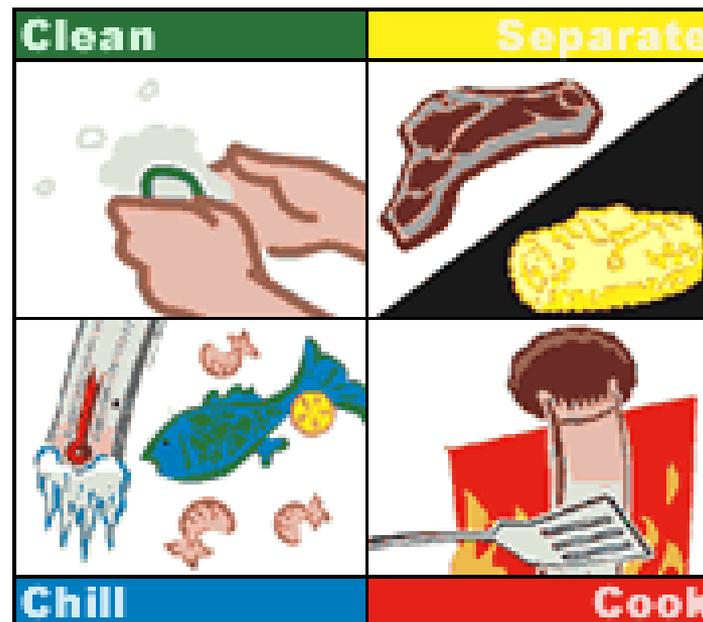


- 4. Food not protected from contamination by other sources**
 - a. Utensils or conveyances of food unclean or not sanitized**
 - b. Utensils or conveyance equipment not cleaned between use**
 - c. Ready-to-eat foods are subjected to cross contamination from raw foods, or cross contamination between species is likely to occur**
 - d. Food exposed to toxic chemicals**
 - e. Utensils stored in places where they can be contaminated**
 - f. Insect activity in and around utensils and work surfaces**
 - g. Sewer system contamination**
 - h. Proper cleaning equipment not available**



5. Improper cooling or refrigeration

- a. Food that need proper cooling need an approved method to reduce temperature to 70 degrees or less within two hours
- b. To 41 degrees or less within 4 hours
- c. Potentially hazardous foods need to be stored at a safe temperature.



6. Food not adequately cooked or reheated

a. Poultry products not heated to 165 degrees

b. Pork products not heated to 150 degrees

c. Other food not properly heated to the necessary temperature

d. Cooked and refrigerated foods not reheated to 165 degrees fast enough.

e. Inadequate heating equipment used

7. Improper hot-holding procedures for potentially hazardous foods

- a. Potentially hazardous foods held below 135 degrees**
- b. Equipment improperly designed, maintained to maintain proper temperature of 135 degrees**



Food Safety

GENERAL DEFICIENCIES

8. Poor sanitary controls

a. Hand washing facility inadequate, poorly maintained or improperly installed

b. Toilet facility inadequate

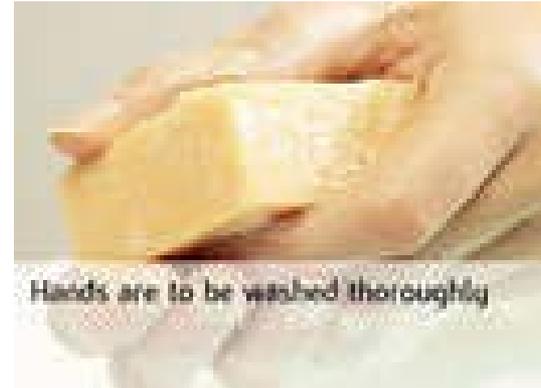
c. Sink and plumbing inadequate

d. Poor lighting and ventilation

e. Materials for cleaning and sanitizing not available or suitable

f. Sanitizing test devices not used when needed

g. Lack of certification or portability or record of disaffection



9. Inadequate sanitary design construction and maintenance

- a. Facility in poor repair**
- b. Insufficient space to accommodate operation**
- c. Floors, walls, ceiling or fixtures not suitable for operation**
- d. Garbage container not clean, covered or in good repair**



10. Poor hygiene and activities of food handlers

- a. Not maintaining a high degree of cleanness, using precautions to prevent contamination of foods and perspiration, cosmetics, chemical or medicines**
- b. Not wearing clean outer clothing, effective hair restraints or secure jewelry**
- c. Eating, drinking or smoking in a food area**
- d. Non-segregated locker or dressing room and are in poor condition**

11. Inadequate food storage and protection

- a. Temperature deficiencies**
- b. Food not stored or conveyed properly**
- c. Unclean storage containers, improperly covered or labeled**
- d. Bulk food displays are improperly constructed, displayed or handled**
- e. Street clothing or soiled linen exposed in contact with food products**
- f. Improper thawing procedures are used**

12. Processing procedures - educational requirements not met

a. Improper record keeping

b. Code requirements not met

c. Article 28 posting requirements not met

d. Consumer advisory requirement not met

13. Insect, rodent or vermin activity

a. Evidence of rodents observed

b. Insects, birds, other vermin observed within the establishment

c. Pets or domestic animals in facility



14. Equipment utensils and materials adequately utilized and maintained

a. Food contact equipment utensils or conveyances, contact surfaces

b. Non-contact equipment, utensils or conveyances are not clean or in good repair

c. Food equipment improperly designed, constructed or maintained

15. Equipment utensils and materials adequately utilized and maintained

- a. Food contacts equipment, utensils or conveyances contact surfaces unclean or not properly sanitized**
- b. Non-contact food equipment, utensils or conveyances are not clean or in good repair**
- c. Food equipment improperly designed, constructed or maintained**
- d. Thermometers not provided with required**
- e. Unused equipment or materials improperly stored or in an unclean condition**
- f. storage cabinets or shelves are not clean or in good repair**
- g. Packaging materials unclean, improperly stored or handled in an unsanitary manner**
- h. Air system or transfer lines are not clean, properly constructed or in good repair**

16. Other sanitation

a. Chemicals or pesticides improperly labeled stored or handled

b. Outside premises or loading zones improperly maintained

c. Vehicles are not clean or in good repair

d. Morgue area or bottle return area improperly maintained

e. shellfish tags or records improperly maintained

**FOOD
MICROBIOLOGY
& FOODBORNE
ILLNESSES**

FOODBORNE ILLNESS -- DEFINED

A Foodborne Illness Is A Sickness That Is The Result Of Eating Contaminated Food

Each Year There Are Approximately 3 Million Cases of Illness Caused By Contaminated Food

Many More People -- Perhaps Tens Of Millions -- Become Ill, But Do Not Report It, Because They Think They Have The Flu Or An Upset Stomach

About 5,000 People Die Each Year

Making Sure The Food You Serve Is Safe Is Job One

Food Contamination -- Types Of

Biological Food Contamination

Food Contaminated By Living Organisms Or Their Toxins In Sufficient Quantity to Cause Illness

Chemical Food Contamination

Food Contaminated By Chemicals Such As Pesticides, Metal Substances, and Cleaning Supplies

Physical Food Contamination

Food Contamination By Physical Objects Such As Hair, Dirt, Glass, Staples, etc.

Biological Food Contamination -- Food Microbiology

Four Types Of Microorganisms Can Cause Foodborne Illness

1. Bacteria
2. Viruses
3. Parasites
4. Fungi

Bacteria -- Defined

Bacteria are single celled microorganisms that require food moisture and warmth to reproduce. They reproduce by fission (or splitting in half).

Bacteria are found everywhere, including on the skin. Although some bacteria are helpful, other species are dangerous and cause foodborne illness.

Your goal is to limit the growth of bacteria in food to numbers too small to cause a foodborne illness.

Viruses -- Defined

Viruses are much smaller than bacteria.

They are not a cellular organism per se, but instead reproduce by taking over an organism's reproductive capability to reproduce. A single infection cycle from 1 virus can produce hundreds or thousands more viruses.

Poor personal hygiene often contributes to the spread of viruses to foods.

Parasites -- Defined

Parasites are tiny single-celled or multi-cellular microorganisms that live or feed off of other organisms

Parasites are many times larger than bacteria or viruses..

Once introduced to the human, they reproduce many times eventually causing illness or even death.

Parasites are most commonly found in hogs, fish, and contaminated water.

Fungi -- Defined

Fungi include both molds and yeast. They grow readily on all types of food.

They can grow in both moist and dry environments, at most temperatures.

Some fungi are beneficial, such as the yeast used in making bread wine and beer, or the molds used in making cheese and penicillin.

Others are poisonous to humans, producing toxins.

Toxins -- Defined

Toxins are poisonous substances of a variety of origins, including, bacteria, fungi, as well as higher animals and plants.

One of the most commonly known toxic diseases is botulism caused by a bacteria..

Fresh fish are a major concern when it comes to toxins, they must be stored at the correct temperature.

A major problem with toxins is that killing the bacteria still leaves the toxin untouched.

Chemicals -- Defined

Chemicals are solids or liquids which are not living or physical contaminants .

They include pesticides and cleaning supplies as well as metals from cookware or utensils.

They can be introduced by error or can be deliberately placed in food by an employee or other person.

Physical Contaminants -- Defined

Physical contamination in food occurs when objects such as dirt, fingernail clippings, glass, hair metal shavings, staples or food packaging pieces get into food.

As with chemical contamination this can be as a result of employee error or deliberate sabotage.

Your best weapon against physical contamination is proper hygienic practices.

Food Adulteration -- Defined

Food need not be contaminated to be made unsafe for consumption.

Food Adulteration occurs when foods are deliberately altered (as mentioned with chemical or physical contaminants) so as to debase or degrade the quality of the food.

Foods are also to be considered adulterated if they are mislabeled, or the labels have a lack of informative labeling.

Monitoring of Foodborne Illness

Foodborne illness is monitored by state and local agencies.

Additionally, the Center for Disease Control (CDC) can help these agencies determine the causes of an outbreak of foodborne illness.

The CDC also puts out statistical information about the causes, the incidence, and the severity of foodborne illness outbreaks across the country.

One publication “Faulty Procedures Leading to Foodborne Illness Outbreaks” is especially enlightening.

Causes of Foodborne Illness Outbreaks

Inadequate cooling and cold holding of food. -- 63 %

Preparation of food too far in advance of serving -- 29 %

Inadequate hot holding of food -- 27 %

Poor personal hygiene by an infected food worker -- 26 %

Inadequate reheating of food -- 25 %

Inadequate cleaning of equipment -- 9 %

Improper use of leftovers -- 7 %

Cross-contamination -- 6 %

Totals are greater than 100% because often more than one cause is identified.

The Danger Zone

Foods with a temperature between 41F (5C) and 135F (57C) are said to be in the danger zone.

That is because bacteria and other living contaminants grow well at these temperatures.

This means the longer food stays in this range the greater the chance of contamination and creation of a foodborne illness outbreak.

In all four of the top five causes of foodborne illness outbreaks are due to food remaining for too long in the danger zone.

Hygienic Practices

Two of the major causes of food contamination can be overcome by proper hygienic practices.

These include proper handwashing and use of gloves, hairnets, etc. (personal hygiene -- 26 %) and

Proper cleaning and sanitation of equipment (9%)

Taking strides to make sure proper procedures are followed with regard to hygienic practices and minimizing time spent by food in THE DANGER ZONE, mentioned in the previous slide, would greatly eliminate contamination and foodborne illness outbreaks..

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Three Facts About Bacteria

Bacteria grow on food.

Bacteria are a form of microbial contamination.

Bacteria are the leading cause of foodborne illness.

More Facts About Bacteria

There are more bacteria on and in your body than there are cells your body is made up of. Most of these are helpful, or at least harmless, such as the normal bacteria in your intestines which help you digest vegetables.

Bacteria are capable of living in almost any conditions found on earth. Some live in the polar ice cap, others live in desert rocks, still others live in superheated vents in deep ocean trenches.

Only a small fraction of earth's bacteria are harmful to humans, but these few are responsible for the majority of human diseases.

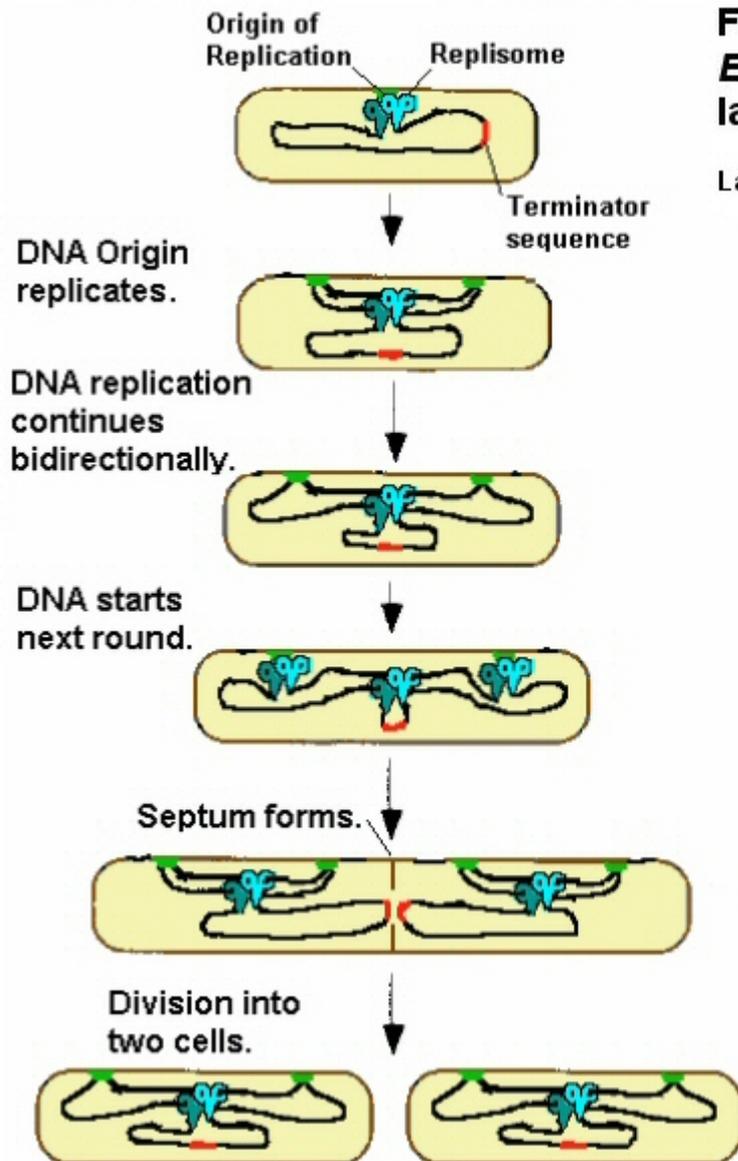
How Bacteria Multiply

Bacteria multiply by a method known as fission or cell division.

This method calls for replication of the genetic material, which then migrates to opposite poles of the bacterium.

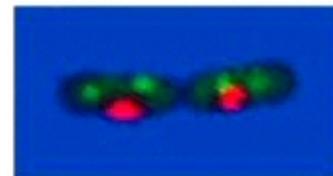
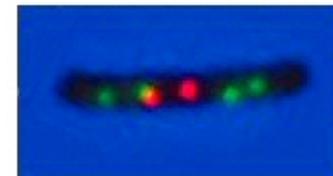
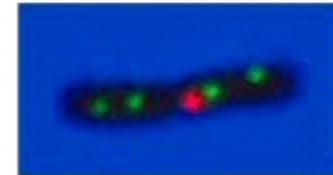
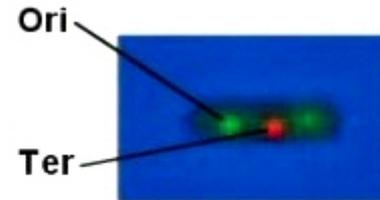
The center pinches in dividing the bacteria in half and two bacteria are formed.

What makes bacteria replicate so fast (once every 10 minutes) is that they do not wait for cell separation to complete to start another round of replication of DNA and hence cell division.



Fluorescence microscopy: *E. coli* cells with fluorophores labeling Ori and Ter

Lau et al (2003) Mol. Micro. 49:731



Bacteria Replication

After 10 minutes some bacteria will divide in 2. After another 10 minutes, each of these bacteria will divide yielding 4 bacteria.

In 10 more minutes there are 8 bacteria (30 minutes)

In 40 minutes there are 16 bacteria.

In 50 minutes there are 32 bacteria.

In 60 minutes there are 64 bacteria.

In 70 minutes there are 128 bacteria.

In 80 minutes there are 256 bacteria.

In 90 minutes there are 512 bacteria.

In 100 minutes there are 1024 bacteria.

Bacterial Replication

In 200 minute (3 hours and 20 minutes) there are slightly more than 1 million bacteria.

In 300 minutes (5 hrs) there is slightly more than a billion bacteria.

This type of growth is known as exponential.

Six Factors Influence Bacterial Growth

Amount of available oxygen.

Amount of available moisture or water.

Acidity - Alkalinity

Protein

Temperature

Time

Available Oxygen

Bacteria that grow in conditions with no free oxygen are called anaerobic bacteria. One example is clostridium botulinum, which causes botulism a severe illness that can lead to death.

Bacteria that need free oxygen are called aerobic bacteria. Pseudomonas is a type of such bacteria, and causes much food spoilage.

Facultative bacteria can grow with or without oxygen, and these are the most common causes of foodborne illness, including Salmonella and Shigella.

Moisture

Food must have sufficient water to grow and multiply.

Many food preservations techniques aim at reducing available water, and thereby reducing rates of bacterial growth.

These techniques include freezing, drying, or adding salt or sugar.

Acidity -- Alkalinity

Acidic food examples -- citrus juices, tomatoes and cranberries.

Neutral food examples -- milk, meat, and fish

Alkaline food examples egg whites and soda crackers.

Most harmful bacteria thrive in the slightly acidic or neutral foods.

Protein

Just like you and I, bacteria need food on which to survive.

High protein foods like milk, meat, fish, and eggs are the preferred food of bacteria.

In other words harmful bacteria grow best on food intended for human consumption.

Temperature/Time

Bacteria multiply best at a specific temperature. The more time that bacteria remain at that temperature, the more bacteria will be infecting the food. This growth is exponential as discussed earlier.

In order to reduce the risk of foodborne illness outbreaks, the most powerful tools we have are restricting the time and temperature at which bacteria are held, so that growth of bacteria is minimized.

PHF[TCS]

Potentially

Hazardous

Foods --

Time/Temperature

Control for

Safety

Potentially Hazardous Foods

Foods that provide bacteria with the 6 growth factors are known as Potentially Hazardous Foods

Example of PHFs include (but are not limited to) -- milk, meat, and fish

PHFs also include sliced cantaloupe, sliced watermelon, tofu and soy protein foods, cooked rice or beans, warmed or cooked fruits and vegetables.

Non-Potentially Hazardous Foods

Include air-cooled hard boiled eggs, or pasteurized eggs, with shells intact.

Include commercially sterile shelf stable foods in containers with an airtight seal.

Include foods treated with preservatives or reduced oxygen packaging designed to reduce growth of bacteria.

The Danger Zone

Most harmful bacteria thrive in the Danger Zone.

The Danger Zone is a temperature range from 41F (5C) to 135F (57C)

This range includes “room temperature”, the temperature where almost all food preparation occurs.

Most foods are served at temperatures in the danger zone.

4 Hour Maximum

Food should spend a maximum of 4 hours in the Danger Zone. This includes:

Transportation

Transfer (unloading the truck)

Storage

Preparation

Displaying

Reheating

Serving

Waiting to be eaten

FATTOM

Six variables about a food determine how likely it is to lead to a foodborne illness. One easy way to remember them is with “FATTOM”

Food

Acidity

Time

Temperature

Oxygen

Moisture

Foodborne Illnesses

Can be caused by a number of sources including bacteria, viruses, parasites and fungi.

Can be either an infection (caused by an organism) or intoxication (caused by a toxin or poison produced by an organism) or both.

Have an incubation period (time elapsed between eating the tainted food and onset of the illness). The incubation period for a foodborne intoxication is much shorter than a foodborne infection, because the foodborne infection requires growth of the bacteria inside the body.

Bacterial Survival Techniques

We have already seen that bacteria thrive on the right foods held at the right temperatures.

However bacteria also survive in temperatures outside the Danger Zone. At temperatures below 41F (5C) bacteria continue to multiply, just more slowly.

In frozen food bacteria lay dormant. They are still alive, but they are not active, and not multiplying.

Drying food can have the same effect.

Warming frozen foods or adding water to dried food activates the bacteria and they begin multiplying once more.

Bacterial Survival Techniques

Most bacteria are destroyed by cooking to temperatures above 135F.

However some bacteria have a defense against this. At high temperatures they turn into spores. This protects them against harsh conditions.

When the food is cooled, the spores revert back to new bacteria, ready to grow and create illness.

Seafood Toxins

Most seafood toxins, found in fish and shellfish, are the result of various algae and plankton (microorganisms) in the marine environment. At certain times of the year, these microorganism populations may increase dramatically (bloom) .

Scombroid poisoning is caused by a toxin produced in partially spoiled tuna, mackerel, amberjack, bluefish, roundfish, bonito, marlin, mahi mahi and sardines.

Other poisons have been linked to tropical reef fish such as barracuda, grouper, and snapper.

Seafood Toxins

Still other toxins have been found in shellfish such as clams, cockles, mussels and scallops.

Toxins are naturally occurring in other fish such as eels, minnows, morays and pufferfish..

These toxins cause illness in 5 minutes to 4 hours.

These toxins cannot be destroyed by cooking them.

Always purchase fresh fish from an approved supplier.

Plant Toxins

Toxic plants include fava beans, jimson weed, rhubarb leaves, and water hemlock.

A wide variety of mushrooms are toxic and can cause foodborne illness and even death.

These toxins cannot be destroyed by cooking them.

Always purchase mushrooms from an approved supplier.

Salmonellosis

Estimated to be over 2 million infections every year in US.

Major cause is raw or undercooked poultry products. Also caused by meat, milk, eggs and egg products, and other high protein foods.

Incubation period is 6 to 72 hours with normal symptom onset of 12 to 36 hours.

Symptoms include fever, headache, nausea, vomiting, abdominal pain and diarrhea.

Typhoid Fever

Caused by the *Salmonella Typhi* Bacterium.

Transmitted by fecal-to-food (poor hand washing) or contaminated water.

Incubation period of 3 days to 3 months, usually 1-3 weeks.

Symptoms include fever, headache, weakness, rash, loss of appetite and abdominal pains.

Shigellosis

Caused by the shigella bacteria.

Transmitted by fecal-to-food (poor hand washing).

Main foods implicated are mayonnaise based salads (tuna, chicken, potato. Other foods are gravies and milk products.

Incubation period is 12-96 hours, usually 1-3 days.

Symptoms include fever, chills, dehydration, abdominal pains, and diarrhea.

Hemorrhagic Colitis

Caused by the specific strains of the E. Coli bacteria that have gained the ability to produce Shiga toxins.

Transmitted by fecal-to-food (poor hand washing) or contaminated water.

Incubation period of 3 -8 days, usually 3-4 days.

Symptoms include fever, nausea, vomiting, diarrhea (often bloody) and cramps.

Main source is ground beef, but unpasteurized milk, cider, and juice, cheese, raw vegetables, and non chlorinated water have been implicated.

Listeriosis

Caused by the Lister bacteria, which have the capacity to grow at temperatures below 41F (5C).

Transmitted by fecal-to-food (poor hand washing) or contaminated water.

Incubation period of 1day to 3 weeks.

Symptoms include fever, lack of control of movement and paralysis.

Main source is unpasteurized milk, cheese, and ice cream, but can also be caused by raw vegetables, meat, poultry and seafood.

Vibrio Parahaemolyticus

Vibrio thrives in seawater and is associated with pollution. The main implicated food is raw shellfish.

Incubation period of 4-30 hours, usually 12-24 hours.

Symptoms include nausea, vomiting, diarrhea and abdominal pain.

Campylobacteriosis

Caused by the Campylobacter bacteria.

Transmitted by fecal-to-food (poor hand washing).

Incubation period of 1-10 days, usually 2-5 days.

Symptoms include fever, nausea, headache, and diarrhea (often bloody).

Main source is beef, pork, lamb, poultry, unpasteurized milk, but raw vegetables have also been implicated.

Botulism

Caused by the *C. botulinum* bacteria, which can only grow without air. It produces the botulism toxin.

Transmitted by fecal-to-food (poor hand washing).

Incubation period of 12-36 hours, often several days.

Symptoms include headache, fatigue, double vision, difficulty breathing, nausea, vomiting, diarrhea, and abdominal pain

Main source is inadequately processed foods such as canned foods meats, vegetables and smoked products.

Staphylococcus

Caused by the *Staphylococcus aureus* bacteria, commonly found on the nose throat and skin, and in cuts on human beings.

Incubation period of 30 minutes to 8 hours, usually 2-4 hours.

Symptoms include nausea, vomiting, diarrhea, and dehydration.

Main source is meats, mayonnaise based salads, but poultry, egg products and other high protein foods have been implicated.

Bacillus Cereus Gastroenteritis

Both a bacterial infection and and intoxication (poison).

Incubation period of 1-6 hours if vomiting is predominant or 6-24 hours if diarrhea is predominant.

Symptoms include nausea, vomiting, diarrhea, and abdominal cramps.

Found in dust soil and cereal crops, the main source is rice and rice dishes, pasta, potatoes and cheese. Also implicated are custards and puddings, soups and casseroles, milk and dairy products, meats, vegetables, and fish.

Clostridium Perfringens Gastroenteritis

Both a food borne infection and an intoxication (poison).

Incubation period of 6-24 hours, usually within 10-12 hours.

Symptoms include diarrhea, and abdominal pain.

Bacteria is spore forming and therefore heat resistant, it is found commonly in the soil and human digestive tract.

Main source is improper hand washing transfer to cooked meat, poultry products, cooked beans, and also dairy products, stews, gravies and sauces.

Viruses

Viruses are a microbial contaminant which consist of genetic material encased in protein. They are much smaller than bacteria.

Viruses replicate by invading living cells and forcing them to make copies of the virus. Eventually the cell bursts releasing thousands of new viruses.

Since food is not living material, viruses do not replicate on food but are instead are transferred to it by means of unwashed hands.

Common food borne illnesses caused by viruses include Hepatitis A, Norovirus, and Rotavirus.

Hepatitis A

Normally cause by contamination of food by feces, urine or blood, carried by means of unwashed hands.

Hepatitis A can also be caused by shellfish taken from water polluted by raw sewage.

Hepatitis A has a long incubation period, from 2 to 6 weeks.

Symptoms include fever, vomiting, jaundice, nausea, cramps, and muscle weakness, and can last from weeks to several months.

Implicated foods are salads, deli meats, milk products, juices, raw vegetables and raw shellfish.

Norovirus

Disease of the gastrointestinal tract, normally passed on by fecal transmission to food, as a result of poor or no hand washing.

Illness onset is usually 24 to 48 hours after eating the contaminated food.

Symptoms include nausea, vomiting, diarrhea, abdominal pain, headache and low-grade fever.

Implicated foods include ready to eat foods, salads, raw vegetables, and shellfish.

Rotavirus

Disease of the gastrointestinal tract, normally passed on by fecal transmission to food, as a result of poor or no hand washing.

It can also be picked up in contaminated water.

Symptoms include vomiting, diarrhea, abdominal pain, and low-grade fever.

Virus Infection

Since most viruses are killed by heat, the most likely foods to transmit viral infections are those which are not heated after handling.

These foods include bakery products, desserts, fruit, luncheon meats, milk, raw shellfish, sandwiches, and salads.

The best weapon against transmitting a virus, is proper handwashing, particularly thorough and washing after using the restroom, coughing, or sneezing .

Parasites

Parasites are organisms that live on or in another organism and obtain nourishment directly from this host.

Parasites are many times larger than bacteria, but are still too small usually to be seen with the naked eye.

Common parasites include protozoa tapeworms and roundworms, and can infect the system for years.

Trichinosis

A disease caused by a form of roundworm, *Trichinella spiralis*.

Usually caused by eating improperly cooked pork (especially sausage) or wild game such as bison or bear.

Symptoms include, diarrhea, fever, nausea, vomiting, muscle pain, and facial swelling.

Incubation period is 4 to 28 hours.

Best defenses are to make sure all meat is cooked properly, and that meat grinders and slicers are properly sanitized after each use.

Aniskias

Caused by *Aniskasis simplex*, a parasite found in some saltwater fish.

Symptoms include nausea, vomiting, severe abdominal pain, diarrhea, tingling in throat and coughing up worms.

Linked to raw, undercooked or improperly frozen seafood such as cod, fluke, flounder, haddock, halibut, herring, monk, mackerel, and salmon.

Treating Fish

Only purchase saltwater fish from approved suppliers, and accept only sashimi grade (which has been properly treated to eliminate parasites).

Freeze it to -4F (-20C) or lower for 7 days in a freezer, or -31F (-35C) for 15 hours in a blast chiller, or freeze to at least -31F (-35C) and store for at least 24 hours at -4F (-20C)

Toxoplasmosis

Caused by *Toxoplasma gondii*, a parasite found in animal feces, especially cats, and contaminated water.

Outbreaks have been linked to undercooked lamb, pork, poultry, and wild game.

Improper handwashing has been linked to outbreaks.

Cyclosporiasis

Caused by the parasite, *Cyclospora cayetanensis*.

Outbreaks have been tracked to raw produce, contaminated water raw milk and some fish.

Symptoms include fever, nausea, abdominal cramping, and diarrhea.

Avoid outbreaks by thoroughly washing produce and practicing good personal hygiene.

Cryptosporidiosis

Caused by the parasite, *Cryptosporidium parvum*.

Outbreaks have been tracked to salads and raw vegetables, ready to eat foods, milk and unpasteurized apple cider.

Symptoms include nausea, abdominal cramping, and diarrhea.

Avoid outbreaks by thoroughly washing produce and practicing good personal hygiene.

Giardiasis

Caused by the parasite, *Giardia lamblia*.

Outbreaks have been tracked to ice cubes, contaminated salads and other raw vegetables washed in improperly treated water..

Symptoms include fatigue, nausea, gas, abdominal cramping, diarrhea and weight loss.

Avoid outbreaks by thoroughly washing produce and practicing good personal hygiene.

Fungi

Attach themselves to organic matter, normally dead matter and survive by consuming it as food.

Food served by the food service industry is a perfect medium for their growth.

Fungi are not the cause of illness directly, but they do produce toxins which can poison people.

Aside from that they cause food spoilage as well.

Yeast

Yeasts are essential in making of beer, wine, penicillin, and baked goods .

They ferment sugars found in food, converting them to alcohol or acetic acid, depending on conditions.

Yeast grow well in acid foods such as fruit juices, honey, jellies and jams, and syrups.

Discard foods spoiled by yeast.

Mold

Molds are essential in making of many food products, most notably cheese .

They are very adaptable surviving on all types of food, from moist to dry conditions, from low to high temperature, from acid to alkaline conditions.

Molds create spores which can be carried by ventilation to other foods or surfaces awaiting food.

Discard foods spoiled by mold. On hard cheeses it is possible to cut away one inch around the mold.

Toxic Molds

Molds can produce a variety of toxins which can cause damage to the nervous system, kidney and liver.

Aspergillus molds for example produce aflatoxin which can cause liver damage. It commonly grows on peanuts, corn, and products made from these, milk, cottonseed and tree nuts.

Freezing mold retards growth. Heating it to 135F (57C) for 10 minutes will destroy most molds.

Cross-Contamination

Defined as the process by which contaminants such as microorganisms are transferred from one food to another, usual transmission on by way of human hands.

Especially dangerous with bacterial contamination, since the bacteria can grow on the food it is transferred to.

A small number of bacteria transferred to a potentially hazardous food (PHF) can quickly become a large amount, resulting in a serious foodborne illness.

All raw food can carry harmful bacteria. This is not a dangerous condition. What is a danger is when these bacteria are transferred to ready-to-eat potentially hazardous food (PHF).

Cooking Foods

Properly cooking foods destroys most bacteria .

Cooked food can be re-exposed to bacteria again after cooking.

This re-exposure is the result of cross-contamination.

Example, uncooked sausage is place on a cutting board and sliced. Bacteria from the sausage remains on the cutting board which goes unsanitized. Cooked sausage and eggs are placed on the board to prepare sandwiches creating cross contamination. The sandwiches are placed under a heat lamp, encouraging bacterial or parasitic growth, leading to a foodborne illness.

Allergens

Allergens are substances in food that cause some people to have an allergic reaction .

Common symptoms include: hives, swelling, itching, tightening of the throat, shortness of breath, nausea, vomiting, abdominal pain, diarrhea.

In severe cases loss of consciousness or even death can ensue.

The eight most common food allergies are: Milk, eggs, fish, crustacean shellfish (lobster and crabs), tree nuts, wheat, peanuts and soybeans. Manufacturers are currently required to list these ingredients on all prepackaged foods.

THE HACCP SYSTEM

HACCP -- What It Stands for

HAZARD

ANALYSIS AND

CCRITICAL

CONTROL

PPOINTS

HACCP -- HISTORY

HACCP was developed by the Pillsbury company in the early 1960s at the request of the National Aeronautics and Space Administration (NASA). A system was needed to make sure that astronauts did not become ill from their food while they were in space. The Pillsbury Company developed the HACCP system with cooperation from NASA, U.S. Army, and the U.S. Air Force Space Laboratory Project.

HACCP was mandated for meat and poultry processing and for seafood processing based on USDA/FDA regulations in the 1990s. Commercial foodservice operations have implemented HACCP, as well as healthcare and school foodservice operations.

HAACP -- Defined

Hazard Analysis and Critical Control Points (HACCP) is a preventative system to reduce the risk of foodborne illness through appropriate food handling, monitoring, and record keeping.

HACCP differs from sanitation programs and personal hygiene programs in its focus, although, all play an important role in providing safe food.

Sanitation programs focus on equipment and facilities.

Personal hygiene programs focus on employees.

HAACP focuses on food to prevent food safety problems..

HACCP -- Seven Principles

1. Identify Hazards
2. Identify Critical Control Points (CCP)
3. Establish Critical Limits
4. Establish Monitoring Procedures
5. Establish Corrective Actions
6. Establish Verification Procedures
7. Establish Record Keeping Procedures

HACCP -- Overview

HACCP combines the principles of food microbiology with quality control and risk assessment to obtain as near as possible a fail-safe system of preparing food.

A plan is drawn up for each different food item performing a Hazard Assessment to identify the Critical Control Points. Handling Procedures are developed and implemented. The plan is monitored and corrections are made. Verify the plan is being followed and maintain records of the plan and its implementation.

HACCP -- Step 1

In the first step, you identify the possible hazards that can cause foodborne illness.

These include unacceptable biological, chemical, or physical contamination and conditions leading to unacceptable growth of microorganisms.

Poor personal hygiene often contributes to the spread of viruses to foods.

HACCP -- Step 1

For example, possible hazards in the handling of hotdogs might be:

1. receiving
2. portioning
3. storage
4. heating
5. maintaining warm
6. serving

HACCP -- Step 2

In the second step, you identify the critical control points which can be put in place such that the hazard that might cause foodborne illness, can be prevented, eliminated or at least reduced to acceptable levels .

HACCP -- Step 2

For example, possible hazards in the handling of hotdogs might be:

1. receiving -- not approved source, meat too warm
2. portioning -- contamination from employee, contact with dirty surface
3. Storage -- refrigeration or freezer too warm
4. Cooking -- heated to temperature not hot enough to kill microbes
5. Hot Holding --- remaining microbes growing
6. Serving -- bacterial contamination from employee

HACCP -- Step 3

In the third step, you establish procedures to be used at Critical Control Points. Usually these guidelines are defined by regulatory standards.

HACCP -- Step 3

For example, guidelines in the handling of hotdogs might be:

1. receiving -- hotdogs must be USDA inspected and held below 41F
2. portioning -- employees must use gloves and work with sterilized equipment on sterilized surfaces
3. storage -- hotdogs must be refrigerated at 41F or frozen
4. Heating -- hotdogs must be cooked to 145F for 15 seconds
5. maintaining hot -- hotdogs must be maintained hot at or above 135F
6. Serving -- employees must wear gloves and use sanitized utensils

HACCP -- Step 4

In the fourth step, you must monitor implementation of safety procedures to be used at Critical Control Points. Continuous monitoring of these critical limits at specified intervals involves careful observations and measurements so that the implementation can be properly documented .

So that workers can properly follow safety procedures, they will need to be thoroughly trained not only in the critical limits, but also in monitoring the procedures in an unbiased fashion.

HACCP -- Step 5

In the fifth step, you must correct any problems with employees following the safety procedures immediately, so that the Critical Control Points (CCPs) are always under control.

HACCP -- Step 6

In the sixth step, you must determine that the HACCP system is working. A good tool is holding regular staff meetings. Encourage employees to ask questions about the HACCP, and explain the need for the safety procedures or critical limits to avoid foodborne illness.

HACCP -- Step 7

In the seventh step, you create an effective record keeping system. This system will be reviewed at health inspections.

This includes records for each menu item, of the hazard assessment (Step 1), the Critical Control Points (Step 2), and the safety measures or critical limits (Step 3).

Includes records of time and temperature monitoring (Step 4).

Includes records of unusual occurrences or deviations and corrective actions (Step 5).

Includes records of employee training and meeting (Step 6).

Crisis Management Plan

All of this Step 7 HACCP recordkeeping should be kept together with a Crisis Management Plan .

The plan should dictate procedures to be followed, contact name and number, and what should be reported and documented.

The plan should be developed, identifying likely problems, and developing a public relations strategy to avoid misinformation.

You should be concerned and respond to all customer complaints, document problems, and update the plan as needed.

Self - Inspection Process

If an operation is not required to have an HACCP plan, it should consider having one to reduce the risk of foodborne illness. At the very least it should have a written self-inspection process on an ongoing basis including:

1. Facilities
2. Food Preparation Areas
3. Service Areas
4. Refrigerators and Freezers
5. Washing and Sanitation
6. Delivery and Receiving
7. Employee Hygiene
8. Waste Disposal

CLEANING AND SANITATION

Hazard Communications

Many of the chemicals that employees will be using are hazardous when misused.

The Occupational Safety and Health Administration (OSHA) has developed a hazardous communication (HAZCOM) standard also known as employee right-to-know about exposure to chemical hazards.

New employees must be trained immediately, and all employees must be trained every year, on the proper use and handling of these chemicals.

Additionally manufacturers labels must be readable and list possible hazards.

Material Safety Data Sheets (MSDS)

Employers are required to keep these sheets in an area available to employees. These sheets provide information about chemicals used including:

1. Safe use and handling
2. Hazardous ingredients
3. Precautions to be taken
4. Correct personal protective equipment to wear
5. Fire, physical and health hazards
6. First aid information, and proper use of first aid materials

Material Safety Data Sheets (MSDS)

Suppliers and manufacturers are required by OSHA to provide these for any hazardous chemicals..

The sheets provide employees with the right-to-know information, listed on the previous slide, about chemicals they might come in contact with.

All MSDS must be kept current. Usual practice is to update the files once a year with all new sheets, and to add or subtract any sheets as new chemicals are added or eliminated.

Hazardous Communication Standards

Each business is responsible for developing a Hazardous Communication Standards (HCS) Program to ensure that employees are properly trained in safety.

The HCS Program is a written program which must include:

All Material Safety Data Sheets

Inventory of all Hazardous Chemicals

Receiving and Storage Procedures

Procedures for Using The MSDS

Chemical Purchasing Specifications, and

Hazardous Communication Standards

The HCS Program is a written program which must include:

Facility Labeling Requirements

Procedures for Reporting and Record-keeping

List of Required Personal Protective Equipment (PPE)

Procedures for Training Employees and Methods for Informing Employees of Non-Routine Hazardous Tasks

Hazardous Materials Disposal Plan Must Be Developed

Difference Between Cleaning and Sanitizing

Cleaning is the removal of food particles, dirt, and stains that can be seen on a surface using hot water and detergent, followed by rinsing with clean water..

In order to avoid the possibility of contamination, the surface must also be sanitized.

Sanitizing is the process of reducing the number of harmful microorganisms either by using very hot water (170F) or chemical solutions.

Cleaning Products

There are four types of cleaning products that are used for loosening and removing surface dirt and food:

Detergents

Acid Cleaners

Abrasive Cleaners

Solvents

Acid Cleaners

Acid cleaners should be used on heavy dirt and stains that detergents cannot remove.

Use to remove mineral deposits such as lime and scale.

Use to remove tarnish on brass and copper as well as rust.

Even low concentrations may damage product surfaces.

Acid cleaners can cause chemical burns to the skin.

Always read manufacturers instructions carefully.

Abrasives

Abrasives can also be used on heavy dirt and stains that detergents cannot remove.

They provide extra scrubbing power by using finely ground minerals like silica. These minerals scour the surface to remove baked on food and stains.

Abrasives should be used with caution, because they can scratch surfaces easily, creating homes for unwanted bacteria.

Be sure that all of the abrasive cleanser is washed away after use.

Solvents

Solvents, more commonly known as degreasers, are detergents, which contain a grease dissolving agent.

They can be expensive to use, especially when used to clean large surfaces, because they must be used full strength.

Sanitizing

All tableware, utensils, equipment, and food contact surfaces used with ready to eat food products must be sanitized after they have been cleaned.

This will kill almost all bacteria which are still present.

Hot Water Method of Sanitizing

The first method of sanitizing is immersion for a minimum of 30 seconds in water remaining at a minimum temperature of 170F.

Achieving this temperature will probably require a booster.

This method is best suited for tableware and utensils since objects need to be held under water for at least 30 seconds.

To prevent burns a dish basket should always be used for dipping.

Chemical Methods of Sanitizing

Immersion Method:

Equipment must be immersed for at least one minute in a clean solution of at least 75F containing one of the following:

50 parts per million (ppm) chlorine

150 - 400 parts per million (ppm) of a quaternary ammonium compound

12.5 parts per million (ppm) of an iodine solution.

Chemical Methods of Sanitizing

Rinsing - Spraying- Swabbing

This method of equipment requires twice the strength of chlorine solutions (100 ppm) and iodine solutions (25 ppm).

Chlorine solutions shall not exceed 200 ppm.

Iodine solutions shall not exceed 25 ppm.

A test kit or other device that measures the parts per million concentration of these solutions must be provided and used.

Choosing the Correct Sanitizer

Chlorine solutions usually work well in soft or hard water, are non-irritating in the proper concentrations, but may cause damage to metals.

Iodine compounds work well in hard water, are non-irritating, and are less corrosive than chlorine so it may be used on rubber or metal.

Quaternary ammonium compounds work in soft water, are not irritating to the skin, do not damage equipment, and can be used after cleaning with most detergents.

Manual Cleaning and Sanitizing Procedures

Equipment cleaning sinks must consist of either two or three compartments and must be supplied with hot and cold potable running water. If a three compartment sink is utilized, the following sequence must be adhered to:

Equipment is to be thoroughly cleaned with a hot detergent solution in the first compartment;

Equipment is to be rinsed in the second compartment;

Equipment is to be sanitized in the third compartment with hot water (170F or higher) or a chemical sanitizer equivalent (75F).

Manual Cleaning and Sanitizing Procedures

If a two compartment sink is utilized, one of the following sequences must be adhered to:

Equipment and utensils shall be thoroughly cleaned in the first compartment with a hot detergent solution that is kept clean and at a concentration indicated on the manufacturer's label and shall be sanitized by immersion for at least 1/2 minute in clean, hot water of a temperature of at least 170°F (congruent to 77°C) in the second compartment,

OR

Manual Cleaning and Sanitizing Procedures

Equipment and utensils shall be thoroughly cleaned in the first compartment with a hot detergent-sanitizer solution that is kept clean and at a concentration indicated on the manufacturer's label and shall be sanitized , by immersion, for at least 1/2 minute in clean, hot water of a temperature of at least 170F in the second compartment, or with a solution containing that same detergent sanitizer at acceptable concentration levels for specific chemical sanitizers. **Note:** A detergent-sanitizer is a specific, commercially prepared, singular compound; not an on-site combination of a detergent and a sanitizer.

Dishwashing Machines

For tableware and utensils, it is better to use dishwashing machines because machines:

Handle large numbers of items.

Use very hot water temperatures.

Distribute cleaning and sanitizing agents in the right strengths.

Dishwasher Checklist

Dirty dishes should not come in contact with food or clean equipment (sides of dishwasher).

Before use check machine is clean and in proper working order.

Check detergent /sanitizer levels.

Scrape plates etc. by hand and pre-rinse.

It may be necessary to soak or scrub stubborn food particles.

Do not overload dishes and utensils when placing into available racks, trays, and baskets.

Dishwasher Water

On single tank machines using chemical sanitizers, wash water should be at least 120 F. Final rinse should be at 165F.

On double tank machines wash water should be between 150F and 165F. Final rinse should be at least 185F.

Water pressure should be 15-25 psi.

Use only potable water, and change the wash water after every peak period. Choose an appropriate sanitizer.

When to Sanitize

Food contact surface areas must be sanitized after:.

Each use

When soiled

When another product has been used (detergent)

Or at least every four hours.

When to Sanitize

Tableware, utensils and food preparation surfaces must be cleaned and sanitized after each use.

Equipment that comes into contact with food must also be cleaned after each use.

Establish evenly spaced schedules for everything else in the food service area. Should there be a spill or spatter, items will need to be cleaned immediately.

When to Clean

Most cooking equipment such as burners need to be cleaned several times a day to remove grease and food particles.

Meat slicers should also be cleaned several times a day, they should be sanitized when changing products to be sliced.

Knobs and handles on oven doors, stoves, etc at least once each day. Microwave ovens and dishwashers should also be cleaned every day.

Scrape pans or trays should be rinsed whenever they accumulate food soil.

Floors and mats should be cleaned once a day.

Drink and Ice Cream Stations

Stationary drink dispensers and soft serve ice cream machines should be designed so they can be sanitized in place.

It should be possible to circulate cleaning and sanitizing solutions throughout, so that they come into contact with all interior surfaces.

Food service trays should also be easy to clean and disinfect.

Always follow manufacturers instructions.

Personal Hygiene

The Human Skin

Human skin is an excellent breeding ground for bacteria. That is because it has conditions that favor their growth. These include:

Neutral pH (neither acidic or basic)

Moisture

Warm temperature.

Protein and other nutrients

Staphylococcus Aureus

One example is the staph bacteria which produces toxins that cause food poisoning.

Approximately 60% of all healthy people have the bacteria growing on their skin, ears, nose, mouth, and throat.

Higher levels of staph are found in pimples, acne, skin wounds, and inflamed skin .

They do not cause illness, because it is at a low enough level, and the staph bacteria doesn't produce toxins under these conditions.

But let staph bacteria get on food and multiply for several hours, and you have a food poisoning just waiting to occur.¹⁴⁰

Unsanitary Habits Contaminate Food

Bacteria are easily transmitted by sneezing, coughing, scratching, and touching the hair or mouth.

If a sneeze or cough is unavoidable, do it away from food and use a disposable tissue. If no tissue is available, you cover your nose and mouth with your upper arm, never your hands.

Afterwards wash your hands by the approved method and change your gloves .

Personal Hygiene Is Essential

Bathe daily with soap and water, use deodorant, arrive clean at work.

Keep fingernails short, well trimmed, and clean.

Avoid wearing false and acrylic nails while handling food .

Do not use nail polish.

Wear an appropriate hairstyle, and restrain hair properly. Regulations may require caps, hair nets, or beard nets be worn.

Sweat Can Contaminate Food

Do not drip sweat onto food, food preparation surfaces, or equipment.

Use a disposable towel or napkin to wipe away your sweat.

Remove gloves, wash your hands, and put on a new pair.

Should sweat drip down onto food preparation surfaces or equipment, it must be cleaned and sanitized immediately.

Should sweat drip down on food it must be discarded.

Always Wear Clean Clothing

Ordinary dirt contains many microorganisms. Some sources are sewage, fertilizers, and pesticides.

Dirty clothing can contain possible bacterial and physical contaminants.

Choose clothing styles which will not come into contact with food, and will not require constant adjustment.

If possible change into your work uniform after arriving at work.

Use An Apron

Always use a freshly washed apron.

Never use your apron as a hand towel. If you wipe your hands on the apron, bacteria in the food particles left on the apron will begin to multiply.

The next time you wipe your hands on the apron, they will become contaminated.

Uniforms and Shirts

Uniforms and shirt should have either no breast pocket, or have the pocket sewn shut so that only a stem thermometer can fit.

This will eliminate the problem of items falling out of the pocket and into the food.

Clothing Changes

If employees are required to change clothes, a dedicated changing area should be provided.

Make sure it is separate from food storage and preparation areas, as well as other equipment and supplies.

Employees can thus store their personal clothes, coats, and purses without contaminating other items.

Washing Hands

Using warm water (at least 100F) wet hands and expose arms above the elbow.

Apply an approved hand washing soap, rub hands and forearms vigorously for at least 20 seconds.

Wash under fingernails and between fingers.

Rinse thoroughly under clear warm water

Dry hands and forearms using a sanitary method, paper towels or hot air dryer

Post proper handwashing technique near all handwashing stations.

Hand Antiseptics

Although useful defense against spreading microbes, should never take the place of proper handwashing.

Never touch food or equipment until the antiseptic has fully dried.

Get in the habit of using a paper towel to turn off faucets and to touch doorknobs after washing your hands.

Hand to Mouth Contact

Can lead to food contamination from saliva droplets.

Contaminated saliva droplets, containing 1000's of microorganisms can spray as far as 24 to 30 inches as a result of a cough .

Never engage in these activities in food preparation areas.

Always wash your hands before returning to the food preparation area.

Disposable gloves

Gloves can lead to food contamination -- just like hands.

It is important to wash hands before putting on gloves .

Wash hands and change gloves after any action that could cause contamination: sneezing, coughing, handling raw meat produce, or certain ready to eat foods, taking out the trash, or handling money .

Take off gloves before leaving the food preparation area.

Gloves must be changed at a minimum, every 4 hours.

Proper Food Tasting Technique

Use a clean utensil to transfer the food to a disposable cup.
Clean and sanitize the utensil after each use.

Sample the food to be tasted away from other foods always
using a clean sterile utensil.

Jewelry

Jewelry should be limited to a plain ring band and/or small earrings or posts. It is even better to wear no jewelry.

Jewelry is very difficult to clean, so it is a source of microorganism transmission to food.

Jewelry can also cause accidents resulting in serious cuts, such as a bracelet being caught in a meat slicer.

Local agencies may have specific regulations concerning jewelry.

Illnesses

Employees in the food service industry who handle food or work in food preparation areas must be disease free.

Employees with symptoms such as fever, vomiting, diarrhea, sore throat, or jaundice must be sent home or reassigned to an area where they will not handle food.

The 2005 Food Code in particular targets contamination with the big five pathogens, Norovirus, Salmonella Typhii (typhoid fever), E. coli, Hepatitis A, and Shigella .

Employees exhibiting symptoms of these diseases must be sent home.

The Big Five

Employees must tell you if they have been diagnosed, or had a previous exposure to contaminated people or foods.

Employees should not be allowed to work with food or in a food preparation area until they receive a written release from their doctor.

Sometimes people who have appeared to recover from an infection, may in fact harbor the microorganisms, as pass them on as a carrier.

This is the reason that you must insist on a doctor's release.

Illnesses

Doctors who treat foodservice workers with foodborne illness will automatically report them to health departments.

HIV positive employees are still permitted to handle food because the HIV virus is not spread through contact with food.

This is also true for employees who suffer from hepatitis B .

Employees with skin conditions such as eczema, can work in the food service industry so long as they wash their hands thoroughly and frequently.

Illnesses

The following illnesses must be reported to the health department:

Noravirus, Hepatitis A, Hemorrhagic Colitis, Salmonellosis, Listeriosis, Typhoid Fever, Shigellosis.

The following illnesses do not have to be reported to the health department:

Scombroid Poisoning and Ciguatera Poisoning.

Four Tiered Employee Health System

Level 1. Food worker exhibits any or all of the following symptoms commonly associated with foodborne illness pathogens:

Vomiting, Diarrhea, Jaundice, Sore throat with fever

or

Food worker is diagnosed with typhoid fever or hepatitis A.

These workers, excreting high levels of pathogens, to be transferred to foods, pose the greatest risk to the public

Four Tiered Employee Health System

Level 2. Includes employees who have been diagnosed with a specific pathogen but are no longer exhibiting symptoms of the disease.

These workers still pose an elevated threat to public health, and must still be restricted from food preparation.

Four Tiered Employee Health System

Level 3. Includes food workers diagnosed with a specific agent but have never developed any gastrointestinal symptoms. Usually identified during the investigation of a foodborne illness outbreak.

Four Tiered Employee Health System

Level 4. Food workers who are clinically well, but may have been exposed to a pathogen, and are within the normal incubation period for the disease.

While these workers present a lower risk than someone who is exhibiting symptoms or has a specific diagnosis, the risk still exists that they will develop symptoms, becoming a level 1 risk.

It is important for these food workers to pay particular attention to hygiene.

Blood From Cuts and Sores

Cuts can be minimized by following these safety rules:

- 1) Always use the right right knife for the job.
- 2) Never us knives as can openers, box openers, or screw drivers.
- 3) Keep knives sharp, using a sharpening steel with a guard placed between the handle and the steel.
- 4) Use knives with a guard or shaped handle.
- 5) Wear protective mesh gloves and cuff guards.
- 6) Cut away from the body.
- 7) Never reach blindly for a knife.

Blood From Cuts and Sores

Cuts can be minimized by following these safety rules:

- 8) Never try to catch a knife that has fallen.
- 9) Store all sharp knives in a knife holder.
- 10) Wash all sharp tools and knives separately.
- 11) Throw out all chipped and broken china glassware and utensils.
- 12) Repair damaged equipment.

Blood Is A Food Contaminant

Blood contaminates any food or surface it touches.

If blood gets on any food product it must be thrown out.

If blood falls on any food preparation surface or piece of equipment it must be cleaned and sanitized thoroughly.

Any cut or sore must be covered with a clean water-resistant bandage. The bandage must be changed often because they are difficult to keep clean, especially on fingers.

If the cut or sore cannot be covered by a bandage, the employee must be reassigned to tasks which do not impinge on food preparation.

Avoiding Burns

Burns can be minimized by using the following safety rules.

- 1) Use dry flame proof potholders.
- 2) Before lifting make sure that pot and pan handles are sturdy.
- 3) Lift lids carefully, making sure steam escapes away from the face and hands.
- 4) Turn pan handles inward on the stove, and ensure they are not over an open flame or too near to heat.
- 5) Keep stove, oven and broilers closed, do not touch their edges.
- 6) Avoid hot edges of heat lamps.

Avoiding Burns

Burns can be minimized by using the following safety rules.

- 7) Never place food items with excessive moisture directly into hot shortening.
- 8) Never clean glassware, dishware ovens , equipment, etc. until it is cool.
- 9) Keep stovetops and hoods free of grease.
- 10) Wear gloves and an apron for protection when filtering or changing shortening.
- 11) Never pour water on a grease fire. Smother the fire and call the fire department.
- 12) Always follow manufacturers instructions for coffee makers, espresso, and cappuccino makers, etc.

Burns As A Source of Contamination

Seepage from burns contaminates any food or surface it touches.

Any burn must be covered with a clean water-resistant bandage. If the burn is on the finger, it must also be covered with a protective glove or finger cot.

If the burn is severe and cannot be covered by a bandage, the employee must be reassigned to tasks which do not impinge on food preparation. The employee should be sent to the doctor for examination and comply with the doctor's instructions.

TEMPERATURE CONTROLS

TEMPERATURE CONTROLS

In order to ensure food does not promote the growth of organisms that cause foodborne illness, it must be held at temperatures that prohibit microorganism growth.

These phases are receiving, holding raw, cooking, chilling, warming, and holding for serve.

Specific thermometers are recommended for checking temperatures at various points in the preparation chain.

BIMETALLIC THERMOMETER

The most common type of thermometer used is the bimetallic metal-stemmed thermometer.

It measures temperature via a metal probe with a sensor in the end. Most thermometers are read in even increments, 0°F to 220°F and will withstand freezing or breaking at these extremes.

Ensure the thermometer is at least 5 inches long, is easy to read, and can be calibrated to maintain accuracy within plus or minus 2F.

BIMETALLIC THERMOMETER

When used, the stem of the thermometer must be inserted to the stem's dimple mark, to ensure the entire sensor is submerged.

Only use thermometers with stainless steel stems. Glass and mercury stems break easily, contaminating food .

DIGITAL THERMOMETER

Metal stemmed digital thermometers are also available in a variety of styles including pocket and panel-mounted digital displays.

Thermocouples and thermistors read the temperature through a metal sensor and display the results on a digital readout..

These types of thermometers are suited for testing internal temperatures of firm foods such as beef roasts or whole turkeys .

AN ARRAY OF PROBES

Various temperature probes are used for different purposes, such as:

Immersion probes to measure liquid temperatures such as fryer oil.

Surface probes designed to measure surface temperatures of foods.

Penetration probes, to measure internal temperatures of food.

Air probes designed to measure internal temperatures of ovens refrigerators and freezers.

INFRARED THERMOMETER

Infrared, or laser thermometers are used to measure surface temperatures. They do not measure air temperature or internal temperature of food.

Although these non-contact thermometers, reduce the risk of cross-contamination, and damage to foods, they have limited use, because they measure only surface temperature, and temperatures cannot be taken through glass or if the object is on a shiny metal surface such as stainless steel or aluminum.

USING A BIMETALLIC THERMOMETER

Insert the probe, at least up to the dimple. With a roast, insert to the center of the meat. Test various parts, including the thickest one. Wait for the indicator to stop moving. Test a casserole in the center.

Do not touch any bones or the bottom or sides of the container.

Clean the thermometer with alcohol or sanitizer, or dip in boiling water for 7 to 10 seconds between each use.

OTHER THERMOMETER USES

Use a thermometer to check food deliveries to ensure that no temperature abuse has occurred.

To test temperature of vacuum packed foods, insert the thermometer between two packages.

With other packages or bags, insert the thermometer in the fold .

To test milk and other liquids, insert the thermometer stem into the carton or bottle.

CALIBRATING BIMETALLIC THERMOMETERS

Place a bimetallic metal thermometer at least three inches into a 50/50 crushed ice to water slush. The temperature should read 32F. Set the thermometer as necessary.

RECEIVING

All food products brought into your establishment must be inspected carefully to ensure they meet specifications.

When possible, arrange for food deliveries to occur during slow periods to facilitate careful examination of goods, and to allow for rapid movement to their storage areas. Only authorized personnel should accept deliveries.

Choose reputable suppliers, known to distribute sanitary, wholesome products.

RECEIVING

Receiving is the point at which potential contaminated food can enter the supply chain.

In addition to checking that supplies have the right color and smell, you should check temperature of the supplied goods.

- 1) Chilled goods should be at a temperature at or below 41F.
- 2) Frozen foods should be supplied at or below 0F
- 3) Hot food should be at 135F.
- 4) Although there is no temperature cold-holding requirement for whole produce, it is recommended that various produce be held at specific temperature and humidity for maximum shelf life.

RECEIVING -- MEATS

Should be firm, moist, elastic and uniform in color. Smell should not be putrid, sour, or rancid.

Internal temperature of fresh meat should be 41F or below. Frozen meat should be 0F or below.

Poultry should be accepted if it is firm and has no discoloration. Reject poultry if it smells bad or has a sticky texture. Receiving temperature is 41F.

Acceptable raw beef has a bright cherry color. Beef with a green or greyish color is unacceptable..

RECEIVING -- MEATS

Acceptable lamb is a light red color. Lamb with a grayish color is unacceptable.

Acceptable pork is pink with white fat. Pork with a greenish or grayish color is unacceptable..

Any meat that feels slimy sticky or dry should be rejected.

Use extra care when checking in packages of processed and ground meat, because they tend to spoil more easily.

RECEIVING -- FROZEN MEATS

Any of the following should lead to rejection of frozen meats.

Blood on the inside of the box.

Excessive frost or large ice crystals.

Either is indicative that the meat has been thawed and refrozen.

RECEIVING -- SHELLFISH

Shellfish must be purchased only from suppliers listed in the National Shellfish Sanitation Program Guide or the Interstate Certified Shellfish Shippers on the fda.gov website.

All shellfish come with tags that are dated upon receipt. Keep tags for a minimum of 90 days. This makes it easier to trace and recall the product.

Fresh shellfish should be alive when delivered with a maximum temperature of 45F. Shells should be closed or close when tapped.

RECEIVING -- FRESH FISH

Fresh fish should be delivered with an internal temperature of not more than 41 degrees.

Ideally fish should be delivered in a self-draining ice container to prolong shelf life..

Fish should have bright red, moist gills.

Fish should be firm and elastic when touched.

Fish should have clear bulging eyes.

Unacceptable fish have soft flesh, discolored or dry gills, sunken, cloudy, red rimmed eyes. Also look for signs of worms and tumors.

RECEIVING -- DAIRY

All dairy products must be pasteurized Grade A except for powdered milk which may be Grade B.

Milk should be delivered at at or below 41F. It may be accepted at higher temperatures if local laws permit.

Bakery products with custard or cream filling should likewise be delivered at or below 41F, and should be stored at this temperature to maximize shelf liife.

Eggs should be delivered in trucks with an ambient temperature of 45F. They should be refrigerate immediately to the she same temperature.

RECEIVING -- DAIRY

Liquid, frozen, and dehydrated eggs must be pasteurized and bear a USDA inspection mark.

Confirm that use by dates are acceptable, and check for signs of damage or refreezing.

Butter should have a firm texture, even color, no mold, and no rancid smell.

RECEIVING -- FROZEN FOODS

All frozen and refrigerated should be inspected immediately and moved into refrigerators or freezers as soon as they arrive.

Dry foods should be inspected and stored last.

Frozen foods should be delivered and stored at or below 0F.

RECEIVING -- PROCESSED FOOD

It is important to check the temperature of vacuum packed foods. Unsafe bacteria such as *C. Botulinum*, which causes botulism, can grow if temperatures are not in a safe range.

Vacuum packed Potentially Hazardous Foods should be delivered at or below 41F. Vacuum packed fish must be delivered at 38F or below.

Packages should have sell by or use by dates. These dates should be followed.

Vacuum packed dry products such as spices or coffee are not Potentially Hazardous Foods so treat as dry food.

RECEIVING -- PROCESSED FOOD

Reduced Oxygen Packaging -- Three kinds.

Modified Atmosphere Packaging (MAP) -- Replaces air with a gas such as nitrogen or carbon dioxide. Often used pack fresh produce.

Sous Vide -- Literally under vacuum. Used to package partially or full cooked food items.

Vacuum Packaging. Most commonly used reduced oxygen packaging.

FDA requires a HACCP plan for vendors which use MAP or Sous Vide preparation methods.

RECEIVING -- PROCESSED FOOD

It is essential that MAP, Sous Vide and Vacuum Packed foods are free of pathogens that can grow without oxygen.

Products must be received at 41F or lower and must be cooled to 34F within 48 hours.

Frozen products must be frozen when they arrive.

Product can not be held for more than 30 days.

RECEIVING -- DRIED FOOD

Dry food such as cereal, sugar, flour, and dried fruits, should be completely dry, since even a small amount of moisture can lead to microbial growth.

Look for punctures, tears, holes, or slashing in the packaging, signs of insect or rodent infestation.

Frozen products must be frozen when they arrive.

Product can not be held for more than 30 days.

RECEIVING -- CANNED GOODS

It is important to check canned goods when they are received and when they are used.

Only accept canned goods that are free of rust and flaws, such as dents or broken seams.

Examine both ends of the can, and press each end separately. If the opposite end bulges, reject the can.

PREPARING FOOD -- THE DANGER ZONE

Food is typically prepared in the Temperature Danger Zone (41F to 135F). It is called the danger zone as it is the temperature most conducive to growth of harmful bacteria.

Preparation tasks need to be done as quickly as possible. Divide work into smaller batches to reduce preparation time.

Monitor the amount of time Potentially Hazardous Foods spend in the Danger Zone., When it exceeds four hours, discard them. When in doubt, throw it out.

PREPARING FOOD

A food product noted at 70°F is deemed temperature abused and must be discarded. In the cooling process of a hot food item, the product must reach 70°F within two hours. During preparation, the time that potentially hazardous foods are in the danger zone must be minimal.

THAWING FROZEN FOODS

Never thaw food at room temperature. This places food at risk for bacterial growth and spoilage. Instead, thaw frozen meats, poultry, and other products in a refrigerator at 41F or less.

Foods that thaw quickly can be thawed under clean potable running water at 70F or below.

A microwave can be used to thaw food which is to be cooked immediately.

Food can also be thawed as part of the cooking process. For example frozen soup is ideally thawed this way.

Never refreeze thawed food.

MAYONNAISE BASED SALADS

Special care should be taken to control time and temperature and cross contamination when preparing egg, chicken, tuna, pasta and potato salad, since they contain ingredients which support microbial growth, and are not cooked after preparation.

Prepare all other ingredients separately from the raw meat. Wash produce thoroughly. All ingredients should be left in the refrigerator until ready to be mixed.

PREPARING EGGS

Only use pasteurized shell eggs or other approved egg product..

Keep shelled eggs at 45F. Deshelled eggs should be chilled to 41F, or used as quickly as possible.

Wash and sanitize containers that held raw eggs before reusing them.

PREPARING FRESH JUICES

Serve freshly squeezed juices to customers immediately.

It requires an HCCAP plan to pasteurize the juices and sell at a later time.

TIME AND TEMPERATURE REQUIREMENTS FOR COOKING

Most menu items have specific time and temperature requirements for cooking. That temperature may not be monitored in the stove, oven, or steam table. Instead the internal temperature must be taken at several places to determine whether harmful bacteria have been killed.

There are separate temperature requirements for cooking and hot holding (keeping food warmed.) Hot held food should be kept at a minimum temperature of 135F.

VEGETABLES

Vegetables cooked for hot holding must be brought to a minimum temperature of 135F.

SHELL EGGS

Shell eggs must be cooked to a minimum temperature of 145F for 15 seconds, if being served immediately.

Eggs being hot held must be cooked to a minimum temperature of 155 for 15 seconds.

FISH

Stuffed fish and stuffing that contains fish must be cooked to at least 165F for no less than 15 seconds.

Ground, minced, or chopped fish must be cooked to an internal temperature of 155F for at least 15 seconds.

MEAT

Most meat must be cooked to a minimum temperature of 145F for 15 seconds.

Another option for beef roasts, rare roast beef, and corned beef is to cook to 130F for 112 minutes.

Ground beef must be cooked to 155F for 15 seconds or to 157F.

POULTRY AND STUFFING

Whole or ground poultry, wild game, stuffed meat and stuffed pasta should be cooked to 165F for a minimum of 15 seconds.

Never put hot stuffing into a cold product. For larger birds or cuts of meat cook stuffing separately.

USE OF THE MICROWAVE

When cooking raw animal foods in the microwave, cook covered to an internal temperature of 165F.

Rotate or stir the food at least halfway through the cooking process.

Allow food to stand covered for two minutes so that food temperature is uniform.

BREWING TEA AND COFFEE

Automatic tea and coffee machines should have water temperatures of 195F.

Tea leaves should stay in contact with water for a minimum of one minute.

Never hold brewed tea at room temperature for more than one day.

TWO STAGE COOL DOWN PROCESS

When cooling down food substances it should be done in two stages -- 135F (or higher) to 70F in two hours, followed by 70F to 41F in 4 hours. It should take no more than 6 hours for the two stage cool down process.

Reheat food to 165F for a minimum of 15 seconds before serving.

Two stage cool down process is cool at room temperature for the first phase, followed by chilling in the refrigerator for the second phase.

CHILLING LEFTOVERS

Use shallow pans to store leftovers. Cut larger pieces of meat into smaller ones. Refrigerate immediately. This will decrease the amount of time food spends in the danger zone (41F to 135F).

Don't mix leftover with new product or raw food with cooked leftovers.

Reheat leftovers to 165F within 2 hours. If a microwave is used, reheat to 165F and stand covered for 2 minutes so an even temperature is reached.

Do not use leftovers more than once.

ICE

Ice used in drinks is food, and should be carefully handled as such, with scoops, or tongs.

Ice used as food must be made from potable water, and be protected from contamination.

Ice used to cool down food cannot be served in beverages.

Ice containers should be covered between uses, and cleaned and sanitized regularly.

Ice storage bins should be well drained and have an air gap to prevent backflow.

SOFT DRINK AND JUICE DISPENSERS

Should be equipped with a backflow prevention device.

FOOD SECURITY

FOOD SECURITY

Foods must be kept secure from deliberate contamination resulting from criminal activity. To do this alert workers and have procedures in place to minimize food tampering.

Discuss food tampering at team meetings.

Food security program should address two threats -- threats from humans and threats to your establishment.

MINIMIZING THREATS

Screen applicants and vendors to minimize security threats from humans. Encourage employees to report any suspicious activity.

To minimize threats to your establishment, consider exterior and interior threats.

Install video cameras and limit access to the back door.

Inspect all incoming food items, and never accept suspect food items.

Restrict non-employee access to food prep areas.

Install security lights, shatter proof glass windows, and securely bolt doors.

SOURCE OF THREATS

Disgruntled employees pose a large threat to food security. They can contaminate your customers food even if you take steps to stop them. Here are some examples of ways they can hurt your business.

Deliberate contamination of food by improper care of potentially hazardous foods, for example leaving food in the danger zone (41F to 135F) for too long.

Deliberate physical contamination, such as with fingernail clippings.

Deliberate contamination with potentially harmful chemicals, which we will discuss now.

POTENTIALLY HARMFUL CHEMICALS

Pesticides.

Food additives.

Toxic metals.

Sanitizers

Lubricants.

Cleaning products.

If these contaminate the food served customers can get ill rapidly, in some cases within seconds.

DELIBERATE CONTAMINATION WITH PESTICIDES

Pesticides are used in farming. Government regulations limit residual pesticide concentration. Always buy produce from reputable suppliers.

Approved pesticides are harmful if used improperly. It is recommended that they be applied by a licensed pest control operator.

Never spray pesticide on food or a food contact surface. Wrap and store all food before using pesticides.

Store in a secure area separate from food storage and commonly used cleaning agents to avoid food security issues.

Pesticide poisoning is normally a result of carelessness, mislabeling or poor housekeeping procedure, however deliberate poisoning can also occur.

FOOD ADDITIVES

Chemicals that can enhance the flavor of foods, or make them stay fresher longer. Some additive can make some people ill.

Especially vulnerable are people with specific allergies or who suffer from asthma.

Sulfites and MSG are two additives covered by the food code because a significant section of the population are sensitive to these chemicals.

The use of nitrates is only permitted under strict governmental supervision.

DELIBERATE CONTAMINATION WITH CHEMICALS -- SODIUM NITRATE

Used in curing meat. It resembles table salt.

Can trigger a potentially fatal allergic reaction in a person who ingests it.

Due to the tight government regulation surrounding sodium nitrate, it is unlikely that an employee would be able to obtain it to poison the food supply.

DELIBERATE CONTAMINATION WITH CLEANING PRODUCTS

Most cleaning products are toxic. One example is Quarternary Ammonium or Quats, which is a chemical sanitizing compound, relatively safe for skin contact.

Quats when substituted for oil or vinegar is poisonous.

Another example is substitution of dry dishwasher detergent for sugar.

Here, the advantage is that the would be food contaminant is readily available in the workplace.

TOXIC METALS

Some metals are toxic to humans. Care must be taken with metal utensils to ensure that toxic metals do not contaminate food.

Example: do not use enamelware to store food, since the enamel can chip, getting into food, and exposing food to the metals underneath.

Toxic metals (copper, brass, cadmium, lead, zinc, and antimony) can leach into foods.

High acid foods should never be placed in galvanized containers. Do not use copper water supply lines for carbonated beverages.

It is likely that the toxic metals would be introduced in error. The supervisor should ensure the safety of the food by ensuring that toxic metals and enamels are not part of the kitchen cookware .

MEDICATION

Medication provides a special source of contamination. Be sure all medications are clearly labeled and stored in a safe secure place away from food. This will limit the opportunity for food adulteration with possible lethal effects.

DELIBERATE PHYSICAL CONTAMINATION

Physical contamination occurs when non-food objects become mixed in with served food.

Human sources of physical contamination -- Jewelry, a loose pen or thermometer, fake eyelashes, fake nails, bandages.

Other sources include pieces of utensils, dirt, or contaminants from improperly maintained plumbing.

In addition to ensuring conditions leading to accidental contamination of food, supervisors must be on constant guard that physical objects are not deliberately introduced into food served to your customers.

PEST CONTROL

PESTS

The word pest comes from the Latin pestis meaning plague. This indicates that pest control is serious business.

Primary foodservice facility pests include:

Rodents such as rats and mice.

Cockroaches, ants, and house flies.

Bran beetles, weevils, and cereal mites.

LINES OF DEFENSE

Exclusion: Deny pests entrance, food and water, and places to hide and breed.

Offensive: Attack infestations with traps electronic devices and poisons.

Observe: Possible pest infestations may be monitored using traps and glue boards.

COMMENSAL RODENTS

Defined as rodents that eat the same food as people.

Bubonic plague was carried by rats and transferred by fleas to human beings.

Rodents carry many other diseases which they pass on to humans. These include rabies, trichinosis and salmonella.

Most common rodents are the Norway Rat, the Roof Rat, and the House Mouse.

NORWAY RAT

Aliases: brown rat, house rat, wander rat, wharf rat.

Large, with coarse hair, greyish-brown on the back, and greyish white on the belly. It is active any time of the day.

Adult: Length not including tail is 7 1/2 to 10 inches, weight is 12 to 20 ounces

Droppings are about 3/4 of an inch and capsule shaped.

Eat almost anything but prefer garbage, meat, fish and cereal grains..

ROOF RAT

Aliases: black rat, Alexandrine rat.

Length is 6 to 8 1/2 inches not including the tail. Weight is 8-10 ounces.

There are two color phases: black rats which have a sooty black coat of fur on top and a greyish coat on the belly, and Alexandrine rats which are greyish brown on the back, and greyish yellow on the belly..

Prefer to eat vegetables, fruits nuts and cereals.

Droppings are 1/2 inch long, and spindle shaped.

HOUSE MOUSE

Length is 2 1/2 to 3 1/2 inches including the tail. Weight is 1/2 to 3/4 ounces.

There coat is brownish grey on the back, and slightly lighter on the belly. Tails are unicolor, lacking in fur , annd slightly longer than the body.

Eat all kinds of foods but prefer to eat cereals. Tend to nibble rather than steadily feed.

Droppings are 1/8 to 1/4 inch long, and rod shaped.

PESTS AS POTENTIAL HEALTH HAZARDS

House flies contaminate food that can lead to foodborne illnesses such as typhoid fever and dysentery.

They also spread pathogens such as Streptococcus and Staphylococcus.

Birds can be pests in outside dining areas.

Droppings can carry bacteria and fungi that can make customers sick.

They also carry mites and microorganisms that cause encephalitis and other diseases.

MINIMIZING BIRD PROBLEMS

Bus tables quickly.

Sweep up food scraps from the ground frequently.

Post signs asking that customers not feed the birds.

Discourage birds using sound, Mylar helium-filled balloons, netting and wires that deliver a mild shock.

Use repellents carefully as they can fall onto tables or into food.

If birds continue to be a problem work with a licensed pest control operator.

ANTS

Ants do not generally pose a hazard to human health. They can be a turnoff to customers.

Carpenter ants and termites can cause structural damage. Look for signs including sawdust on floors, in drawers, dropping from the ceiling.

Ants can suddenly appear in large numbers when one of them detects food. Ants are drawn to sweets and grease.

BEES

Bees, yellow jackets, wasps and hornets can sting customers in outdoor dining areas.

Some people have a deadly allergy to bee stings, going into shock or even dying.

If you find hives or nests in the area, call your licensed pest control operator to have them removed.

PANTRY PESTS

These insects generally survive on a specific food ingredient such as flour or cereal.

They include weevils, grain beetles, flour beetles, flour moths, and grain moths.

They generally gain entrance by way of purchased food ingredients.

Look for wings, insect bodies, clumping of food and holes in the packaging. Refuse anything that looks suspicious.

PANTRY PESTS

When pantry pests are discovered, the entire container of food must be discarded.

The presence of pantry pests also may be an indicator that food supplies have been stored too long. To avoid pest appearance practice first in first out (fif) by dating all deliveries and ensuring the oldest date container is used next.

Keep storage areas clean and sanitary.

Ensure foods are wrapped and covered.

LESS COMMON PESTS

Include squirrels, bats, and raccoons.

Can carry rabies.

Can also cause structural damage when nesting in your building.

Call your local animal control officer first to see if pests can be removed and safely relocated.

If not, call your licensed pest control operator.

COCKROACHES

Four major species of cockroach.

American cockroach.

Brownbanded cockroach

German cockroach.

Oriental cockroach

AMERICAN COCKROACH

Largest (1 to 2 inches) building infesting roach in the U.S.

Adults are reddish-brown with the head having a pale yellowish band around its margin.

Both the adult male and female are fully winged, but the male is more capable of flight.

They are adapted to warm moist climates, and are often found under tree bark, in alleyways, in basements, and in sewer systems

BROWNBANDED COCKROACH

Adult is 1/2 inch long or less.

Adults are light brown with the wings having pale yellowish yellowish V-shaped band.

Male is long and narrow with wings covering the abdomen. Female is flat with short wings that never cover the abdomen.

Very active and the males fly when disturbed. Difficult to control because they may be found in several places.

They prefer a warm dry habitat.

GERMAN COCKROACH

Most common species found in U.S. homes and restaurants.

Males are 1/2 to 3/4 inches long with wings covering their whole body. They have 2 dark brown stripes on the head

Although capable of flight they rarely do.

Adapted to warm moist climates, near food, and small crevices, cracks, and dark confined places are preferred. In food service they are frequently found behind baseboards, under food processing equipment, sinks, dishwashers and water heaters, in fuse boxes vegetable bins and cash registers, around refrigerators, stored goods and shelves.

ORIENTAL COCKROACH

Adult males are 1 inch long and females are about 1 1/4 inch long.

Deep brown to black in color.

The female has small wings, and the males wings are somewhat larger, but neither are capable of flight.

They spend a great deal of time outside. Cold and drought may cause them to move inside. Once there, crawl spaces under buildings, and leaks under sinks provide a favorite habitat.

RECOGNIZING COCKROACH INFESTATION

Look for cockroaches that appear in the day,.

Fecal droppings.

Cast skins which the young shed as they grow.

Full or empty egg shells.

Stained walls where cockroaches congregate.

A musty smell.

Cockroach nymphs (children).

DENYING PESTS ENTRANCE

The best means of pest control.

Denying insects entrance.

All openings to the outside should be fully screened.

Screen 1 should be of tight mesh, 16 mesh per square or tighter, with no holes or tears.

Only exception is drive through windows, which should be closed when not in use.

Doors should close automatically.

Weather-strip and fill gaps in door frames.

Check deliveries for hidden pests.

DENYING PESTS ENTRANCE

The best means of pest control.

Rodent proofing foodservice facilities.

Rats can squeeze through openings as small as 1/2 inch.

House mice can sneak through 1/4 inch diameter openings.

Openings around doors should be no larger than 1/4 inch.

Wooden doors and door frames should be shielded.

Sewer drains must be screened.

No dirt floors, openings in floors or walls, or gaps around pipes. Any such must be covered.

Care must be taken to avoid importing by other means.

DENYING PESTS ENTRANCE

The best means of pest control.

Other rules of thumb.

Keep areas outside the facility clean and clear of litter.

Keep thick trees and bushes from facility walls.

Eliminate rubbish and debris piles.

Get rid of old unused equipment.

External ground surfaces should be hard, non-porous, and should slope away from the building.

GARBAGE

Garbage containers must have tight fitting lids, doors, or covers -- insect and rodent proof.

Bag all garbage and line all garbage containers.

Garbage areas should be kept clean and dry.

Place dumpsters on hard, non-absorbent surfaces.

Have garbage picked up often.

Exchange dirty dumpsters with clean ones as necessary.

PESTICIDES

Pesticides should only be used as a last resort, after correcting environmental factors that may have contributed to the infestation. Monitor using glue traps, mechanical traps, and roach motels.

Pesticides are regulated by federal, state and local agencies, so it is recommended that you use a licensed pest control operator who knows which pesticide are appropriate for your facility, and how to properly apply them.

Your pest control operator should apply pesticides when your business is closed to maintain the health of workers and customers alike.

STORING PESTICIDES

Store pesticides in locked cabinets away from food storage and preparation areas.

Keep all products in the original container.

Have a material data safety sheet (MSDS) on file for each one.

Store aerosol and pressurized spray cans in a cool place..

Check manufacturers instructions and federal, state and local regulations before disposing of, since they are considered hazardous waste.

PEST CONTROL DEVICES

Certain pesticides and pest control devices can be used by foodservice personnel but only in compliance with product labeling.

Bug zappers and other electrocution devices should have escape resistant trays, and should never be placed above food or above food areas.

Rodent glue boards are especially useful since they are pesticide free.

Never place traps above food or food areas.