

SafeFoodTest.com

Food Protection Manager STUDY GUIDE

Food Safety. Who needs it? Well if you knew what I know, you would agree we all do. Food Safety is much deeper than the accidental or unintentional transfer of pathogenic bacteria to food by a restaurant line cook. It's protecting our food at every level from farm to table; we must understand our food and keep it safe from these intentional and unintentional contaminants. The Study Guide you are about to read goes through the importance of food safety and sanitation from an economic, moral, and legal point of view. If you understand the majority of the concepts in these pages you will be ready to pass a Manager Certification Exam.

As the Great Chef, James Beard, said "Food is our common ground, it's universal" and it has become universal. Consumer demands and the global food market, which has resulted in ingredients coming from far and wide being combined into single products. According to a recent PEW report on Food Safety, Americans insatiable desire for foreign food has expanded tremendously over the last few decades, but over the last seven years it has grown by an average of 10 percent each year. Recently Margaret Hamburg the FDA Commissioner announced measures to assure food safety with regards to imports. We are importing about 15 percent of our overall food supply from 150 different countries so food safety with regards to imports is a big issue. This global marketplace is making it extremely hard to trace contamination sources. I've recently read reports of caramel colored rubbing alcohol being sold as Scotch and scientists have confirmed Genetically Modified Wheat, which is illegal to grow in our country, has grown in Oregon. We know in America approximately 70 billion meals are prepared by 13 million food service workers on an annual basis and that's just the tip of the iceberg, our population is growing and our need to produce safe food at all levels will become increasingly difficult. When you take into consideration these facts it seems imperative that all food workers are trained and competent when it comes to food safety. This text is designed for the Manager or Person in Charge and we believe the truths unwrapped in its pages will guide you to establishing a food safety and sanitation program for any kitchen or food handling operation. We will also stress the importance of food defense in today's society.

Food safety will not go away because the fact of the matter is food fraud, which is very much a part of food safety, is listed in the top 12 most profitable international crimes and we must do something about it. It's sad to say but businessmen, left to their own devices, will attempt to sell unsafe food and not even think twice about it. I have learned so much about our food system over the last couple of years and have come a long way since that fry cook at Taco Bell back in 1984. We must protect our food at any cost and I intend to do just that

Foodborne Illness

- Illness carried or transmitted to people by food (It does not necessarily mean bad food. Sometimes the food is just a carrier, like if someone were to sneeze on a plate of perfectly good food.)

Foodborne-Illness is considered an outbreak when:

- Two or more people have the same symptoms after eating the same food
- An investigation is conducted by state and local regulatory authorities
- The outbreak is confirmed by laboratory analysis

Higher Risk Population (Populations with Higher Susceptibility to foodborne illness)

- Infants and preschool-age children
- Elderly people
- People taking certain medications and/or who have a debilitating illness

Food Favoring the Rapid Growth of Microorganisms – Time Temperature Control for Safety (TCS) Foods previously call PHF potentially hazardous foods

- | | |
|---|-------------------------------|
| ◆ Milk and Dairy Products | ◆ Meats, Fish, Poultry |
| ◆ Shellfish | ◆ Eggs |
| ◆ Cooked Rice, Beans and Vegetables | ◆ Baked Potatoes |
| ◆ Oil Mixtures with untreated garlic or herbs | ◆ Sliced Melons |
| ◆ Raw Sprouts | ◆ Cut Tomatoes & Leafy Greens |

Potential Hazards to Food Safety

- Biological Hazards
 - Bacteria
 - Viruses
 - Parasites
 - Fungi
- Chemical Hazards
 - Cleaning supplies
 - Sanitizers
 - Polishes
 - Pesticides
 - Toxic Metals
- Physical Hazards
 - Metal shavings
 - Staples
 - Bandages
 - Glass
 - Hair
 - Dirt
 - Natural objects (e.g., fish bones in a fillet, fruit pits in a pie)

How Does Food Becomes Unsafe? The Centers for Disease Control and Prevention CDC

Said the following Five Factors are responsible not necessarily in the order listed

Five risk factors for foodborne illness:

- Purchasing food from unsafe sources
- Failing to cook food correctly
- Holding food at incorrect temperatures
- Using contaminated equipment
- Practicing poor personal hygiene

How Food Becomes Unsafe

- Time-Temperature Abuse
- Cross-Contamination
- Poor Personal Hygiene
- Poor Cleaning and Sanitizing

Time-temperature abuse:

- When food has stayed too long at temperatures good for pathogen growth

Food has been time-temperature abused when:

- It has not been held or stored at correct temperatures
- It is not cooked or reheated enough to kill pathogens
- It is not cooled correctly

Cross-contamination:

When pathogens are transferred from one surface or food to another

Cross-contamination can cause a foodborne illness when:

- Contaminated ingredients are added to food that receives no further cooking
- Ready-to-eat food touches contaminated surfaces
- A food handler touches contaminated food and then touches ready-to-eat food
- Contaminated cleaning cloths touch food-contact surfaces

Poor personal hygiene:

Poor personal hygiene can cause a foodborne illness when food handlers:

- Fail to wash their hands correctly after using the restroom
- Cough or sneeze on food
- Touch or scratch wounds, and then touch food
- Work while sick

Poor cleaning and sanitizing:

Poor cleaning and sanitizing:

- Equipment and utensils are not washed, rinsed, and sanitized between uses
- Food contact surfaces are wiped clean instead of being washed, rinsed, and sanitized
- Wiping cloths are not stored in a sanitizer solution between uses
- Sanitizer solution was not prepared correctly

Keeping Food Safe

Training and monitoring:

- Train staff to follow food safety procedures
 - *A training need is the gap between what a person needs to know and what they do know*
 - *The first step in setting up a training program is to conducting a needs assessment to determine training needs*
 - This can be identified by:
 - Testing employee's food safety knowledge
 - Observing employee's performance on the job
 - Surveying employees to identify areas of weakness
- Provide initial and ongoing training
- Provide all staff with general food safety knowledge
- Provide job specific food safety training
- Retrain staff regularly
- Monitor staff to make sure they are following procedures
- Document training
 - *Keep records of all food safety training conducted at the establishment*
 - *Using a simple 4-5 column sheet with the Food Handler name, Food Handler Card Number, the date the Food Handler Card was obtained and the date it requires re-certification. With a copy of the Food Handler Certificate of Training behind the cover page for each food handler.*

Note: SafeFoodTest.com understands this need and provides Food Handler Training Modules for Food Safety Managers to conduct their own training. These modules are broken down by subject for ease of time and access and are free to download by our students at: <http://www.safefoodtest.com/food-manager.php>

Government agencies:

- The Food and Drug Administration (**FDA**) – Writes Model Food Code and makes recommendations on food safety. Inspects foods that are not meat, poultry and eggs, particularly Seafood and Juice Products as well as imported products but as regulates food shipped across state lines.
- U.S. Department of Agriculture (**USDA**) – Is responsible for inspection and quality grading of all meat and meat products, poultry, eggs and egg products as well as fruit and vegetables shipped across state lines.
- Centers for Disease Control and Prevention (**CDC**) – Conducts foodborne illness studies. Tracks illnesses throughout the world, with particular attention to foodborne illness in the US. Supports efforts to track, trace and limit foodborne illness carrying foods.
- U.S. Public Health Service (**PHS**) – Umbrella Government agency that oversees public health issues in the US
- State and local regulatory authorities:
 - Most food regulations are written at the state level
 - Each state uses the FDA Model Food Code or some modified form of it to create laws and establish regulatory requirements
 - State regulations may be enforced by state or local (city or county) health departments (City of Long Beach, Los Angeles County, Orange County, City of Pasadena are a few local regulators)
 - Health inspectors from city, county, or state health departments conduct food service inspections in most states
 - Conducts review and approval of food service facility building, remodeling and upgrading

The Microworld

Microbial Contaminants

Microorganism – Micro: Greek root (Mykros) for small. Organism: living organism

Microorganism is a small living organism

Pathogen – Illness-causing microorganism Greek root (Pathos) for suffering and (Genes) to cause

Toxin – Poison (some of these microorganism produce toxins)

Microorganisms That Can Contaminate Food and Cause Foodborne Illness

- Bacteria- Salmonella, E. coli, Listeria, Vibrio,
- Viruses- Norovirus, Hepatitis A
- Parasites- Cyclospora, Cryptosporidium
- Fungi- Yeast and Molds

Biological Contamination - Bacteria

Bacteria: Basic Characteristics

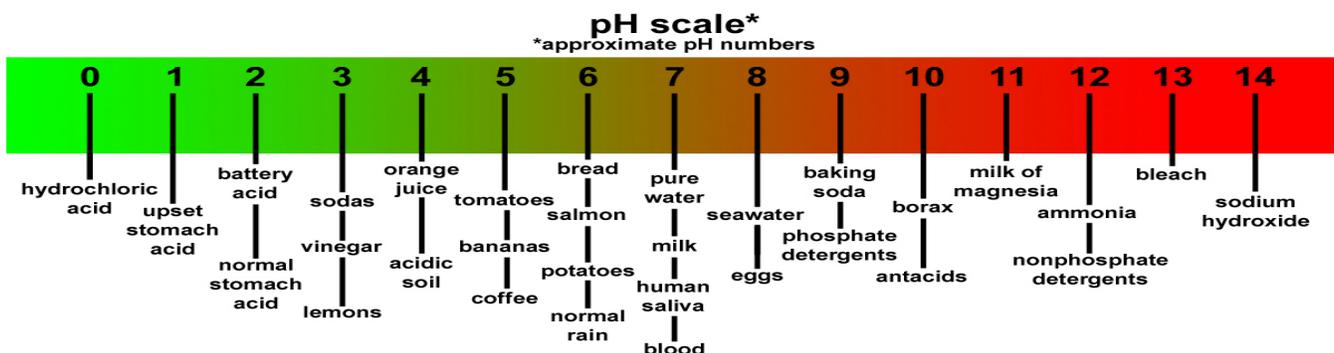
- Location:
 - Found almost everywhere
- Detection:
 - Cannot be seen, smelled, or tasted
- Growth:
 - Will grow rapidly if FAT TOM conditions are correct
- Prevention:
 - Control time and temperature

What environmental factors Bacteria need to Grow:

FAT TOM

Food Foodborne bacteria require nutrients to grow. Specifically carbohydrates and proteins that are found in Time Temperature Control for Safety (TCS) foods, including: Meat, Poultry, and Eggs & Dairy Products

Acidity Foodborne microorganisms grow best in food that has a neutral to slightly acidic pH (7.5 to 4.6)



Temp Foodborne microorganisms grow well at temperatures between 41°F and 135°F (5°C & 57°C) and especially well between 70°F and 125°F (21°C & 52°C)

Organism	Minimum °C/°F	Temperature Optimum °C/°F	Maximum °C/°F
<i>Aeromonas hydrophila</i>	>1->4/<34->39	28-35/82-95	>42-45/<108->113
<i>Aspergillus flavus</i> (aflatoxin production)	10/50	33/91	43/109
<i>Bacillus cereus</i>	4/39	30/86	50-55/122-131 ^a
<i>Brucella</i>	6/43	37/99	42/108
<i>Campylobacter jejuni</i>	32/90	42/108	45/113
<i>Clostridium botulinum</i> type A (toxin production)	4/39	37/99	50/122
<i>Clostridium botulinum</i> type B (toxin production)	3/37	37/99	50/122
<i>Clostridium botulinum</i> type E (toxin production)	4/39	29/84	45/113
<i>Clostridium botulinum</i> type F (toxin production)	4/39	29/84	45/113
<i>Clostridium perfringens</i>	12/53	46/115	50/122
<i>Escherichia coli</i> (pathogenic)	7/45	37/99	46/115
<i>Listeria monocytogenes</i>	-0.4/31	37/99	45/113
<i>Plesiomonas shigelloides</i>	8/46	30/86	45/113
<i>Salmonella</i>	5.2/41 ^a	35-43/95-109	46/115
<i>Shigella</i>	5/41	37/99	47/117
<i>Staphylococcus aureus</i>	7/45 ^b	37/99	48/118 ^b
<i>Streptococcus pyogenes</i>	>10/>50	37/99	<45/<113
<i>Vibrio cholerae</i>	10/50	37/99	43/109
<i>Vibrio parahaemolyticus</i>	5/41 ^a	37/99	43/109
<i>Vibrio vulnificus</i>	8/46	37/99	43/109
<i>Yersinia enterocolitica</i>	-1.3/30	25-37/77-99	42/108

^a Values for some strains vary and may differ slightly from the listed data.
^b Minimal temperature for enterotoxin production is 14C (57.2F); maximal temperature for enterotoxin production is 45C (113F).

Table 1. Optimal and limiting temperatures (rounded to nearest whole number) influencing growth of common foodborn pathogens with other conditions optimum or near optimum (e.g., pH and water activity).

Time Foodborne microorganisms need sufficient time to grow. 4 hours or more in TDZ = growth high enough to cause illness

Oxygen Some foodborne microorganisms require oxygen to grow (aerobic,) while others grow when oxygen is absent (anaerobic) Salmonella and E.coli are facultative anaerobes, which can grow with or without air.

Moisture Most foodborne microorganisms require moisture to grow. Moisture is measured by water activity a_w .

Substance	a_w
Distilled Water	1.00
Tap water	0.99
Raw meats	0.99
Milk	0.97
Juice	0.97
Salami	0.87
Cooked bacon	< 0.85
Saturated NaCl solution	0.75
Point at which cereal loses crunch	0.65
Dried fruit	0.60
Typical indoor air	0.5 - 0.7
Honey	0.5 - 0.7

Controlling Microorganisms:

As food processors or preparers, we can do a lot of thing to change water activity or pH but most likely we will control:

- Temperature - Cook, cool, thaw, hold, refrigerate and freeze food properly
- Time - Minimize time food spends in the temperature danger zone (TDZ) some bacteria can double every 20 minutes.

The FDA has identified four types of bacteria that cause severe illness and are highly contagious:

- **Salmonella Typhi**
Nontyphoidal *Salmonella*
- **Shigella spp.**
- **Shiga toxin-producing *Escherichia coli* (STEC)**

Bacteria: *Salmonella Typhi* (SAL-me-NEL-uh TI-fee)
Source: People

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none"> • Ready-to-eat food • Beverages 	<ul style="list-style-type: none"> • Exclude food handlers diagnosed with an illness caused by <i>Salmonella Typhi</i> from the operation
	<ul style="list-style-type: none"> • Wash hands
	<ul style="list-style-type: none"> • Cook food to minimum internal temperatures

Bacteria: Non-Typhoidal *Salmonella* (NTS)
Source: Farm Animals

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none"> • Poultry and Eggs • Meat • Milk and dairy products 	<ul style="list-style-type: none"> • Exclude food handlers who are vomiting or have diarrhea and have been diagnosed with <i>Salmonellosis</i> from the operation
	<ul style="list-style-type: none"> • Cook poultry and eggs to minimum internal temperatures
<ul style="list-style-type: none"> • Produce, such as tomatoes, peppers and cantaloupes 	<ul style="list-style-type: none"> • Prevent cross-contamination between poultry and ready-to-eat food

Bacteria: *Shigella spp.* (shi-GEL-uh)
Source: Human feces

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none"> • Food easily contaminated by hands, such as salads containing TCS food (potato, tuna, shrimp, macaroni, chicken) 	<ul style="list-style-type: none"> • Exclude food handlers diagnosed with an illness caused by <i>Shigella spp.</i> from the operation • Exclude food handlers who have diarrhea from the operation
<ul style="list-style-type: none"> • Food that has made contact with contaminated water, such as produce 	<ul style="list-style-type: none"> • Wash hands • Control flies inside and outside the operation

Bacteria: Shiga toxin-producing *Escherichia coli* (STEC) **Source:** Intestines of cattle; infected people

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none"> • Ground beef (raw and undercooked) • Contaminated produce 	<ul style="list-style-type: none"> • Exclude food handlers who have diarrhea or have been diagnosed with a disease from the bacteria • Cook food, especially ground beef, to minimum internal temperatures
	<ul style="list-style-type: none"> • Purchases produce from approved, reputable suppliers
	<ul style="list-style-type: none"> • Prevent cross-contamination between raw meat and ready-to-eat food

Other types of foodborne illness caused by bacteria:

- *Listeriosis*
- *Botulism*
- *Staphylococcal Gastroenteritis*

Bacteria: *Listeria monocytogenes* (Listeriosis)
Source: Raw milk, pasteurized fluid milk, and cheeses (particularly soft ripened varieties), ice cream, raw vegetables, fermented raw-meat sausages, raw and cooked poultry, raw meats (of all types), and raw and smoked fish.

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none"> • Ground beef (raw and undercooked) • Contaminated produce • Raw meat • Unpasteurized milk and milk products • Ready-to-eat food including: <ul style="list-style-type: none"> - Deli meats - Hot dogs - Soft cheese 	<ul style="list-style-type: none"> • Prevent cross-contamination between raw or undercooked and ready-to-eat food • Cook raw meat to required minimum internal temperatures

Bacteria: *Clostridium Botulinum* (Botulism)
Source: Improperly canned and vacuum packed foods

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none"> • Incorrectly canned food • Temperature Abused Food (baked potatoes) • Untreated garlic-and-oil mixtures 	<ul style="list-style-type: none"> • Hold, cool and reheat food correctly • Inspect canned food for damage

Bacteria: Staphylococcus Aureus (Staphylococcal Gastroenteritis)

Source: Eyes, nose, throat, hair and wounds

Food Linked with the Bacteria	Prevention Measures
<ul style="list-style-type: none">• Salads containing TCS foods that require handling: Egg, tuna, chicken, macaroni salads• Deli meats	<ul style="list-style-type: none">• Minimize the time food spends in TDZ• Cook, hold, and cool food properly• Wash hands• Cover cuts on hands and arms• Restrict any food handler with infected cut

Spores

Certain bacteria can change into a different form, called spores, to protect themselves

- Spores form when nutrients are not available
- Are commonly found in soil
- Can contaminate meat, poultry, fish, and other food exposed to soil or dust
- Can resist heat, allowing them to survive cooking temperatures
- Can revert back to a form capable of growth when:
 - Food is not stored at the proper temperature
 - Food is not held or cooled properly

Biological Contamination – Viruses

Viruses: Basic Characteristics

- Destruction:
 - Not destroyed by normal cooking temperatures
 - Good personal hygiene must be practiced when handling food and food-contact surfaces
 - Quick removal and cleanup of vomit is important

The FDA has identified 2 viruses that are highly contagious and can cause severe illness:

- **Hepatitis A**
- **Norovirus**

Food handlers diagnosed with an illness from hepatitis A or Norovirus must **NOT work in an operation while they are sick.**

Virus: Hepatitis A (HEP-a-TI-tiss)

Source: Human feces

Food Linked with the Virus

- Ready-to-eat food
- Shellfish from contaminated water

Prevention Measures

- Exclude staff who have been diagnosed with hepatitis A from the operation
- Exclude staff who have jaundice for 7 days or less from the operation
- Wash hands
- Avoid bare-hand contact with ready-to-eat food
- Purchase shellfish from approved, reputable suppliers

Virus: Norovirus (NOR-o-VI-rus)

Source: Human feces

Food Linked with the Virus

- Ready-to-eat food
- Shellfish from contaminated water

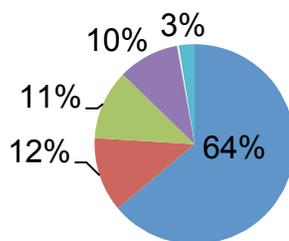
Prevention Measures

- Exclude staff who are vomiting or have diarrhea and have been diagnosed with Norovirus from the operation
- Wash hands
- Avoid bare-hand contact with ready-to-eat food
- Purchase shellfish from approved, reputable suppliers

FOODBORNE ILLNESS

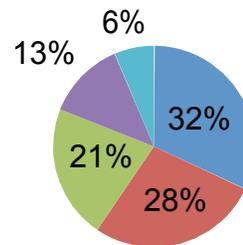
Top 5 Illness causing Pathogens

- Norovirus
- Salmonella
- Clostridium perfringens
- Campylobacter
- Staphylococcus Aureus



Top 5 Killer Pathogens

- Salmonella spp.
- Toxoplasma gondii
- Listeria monocytogenes
- Norovirus
- Campylobacter spp.



Biological Contamination

Highlighted above were 2 viruses and 4 bacteria that form the Big 6. The Big 6 pathogens are a group of foodborne pathogens that are dangerous and highly contagious. The Big 6 pathogens, contaminate the gastrointestinal system after ingestion, and are shed in feces.

The Big 6 includes:

- 1) Shiga toxin-producing *Escherichia coli* (STEC), also known as E. coli
- 2) Nontyphoidal *Salmonella* (NTS)
- 3) *Shigella* spp. (causes shigellosis)
- 4) *Hepatitis A virus* (HAV)
- 5) *Salmonella* Typhi (typhoid-like fever)
- 6) *Norovirus* (The Worst)

Biological Contamination – Parasites

Parasites: Basic characteristics

- Location:
 - Require a host to live and reproduce
- Source:
 - Seafood, wild game, and food processed with contaminated water, such as produce
- Prevention:
 - Purchase food from approved, reputable suppliers
 - Cook food to required minimum internal temperatures
 - Fish that will be served raw or undercooked must be frozen correctly by the manufacturer

Biological Contamination – Fungi

Fungi: Basic Characteristics

- Yeasts, molds, and mushrooms:

Basic Characteristics of Yeast

- Can spoil food rapidly
- Grows well in slightly acidic food with low water activity
- May produce a smell or taste of alcohol as it spoils food
- May appear as a pink discoloration or slime and may bubble

Basic Characteristics of Mold

- Spoils food and sometimes causes illness - Is not destroyed by freezing
- Grows well in acidic food with low water activity - Can produce toxins such as aflatoxins
- Throw out moldy food, unless mold is a natural part of the food

Basic Characteristics of Mushrooms

- Foodborne illness caused by eating toxic wild mushrooms
- Occur when toxic mushrooms are mistaken for edible ones
- Can be prevented by purchasing from approved, reputable suppliers

Biological Toxins

Biological Toxins: Basic Characteristics

- Naturally occur in certain plants, mushrooms and seafood

Seafood Toxins – *Major Foodborne Illnesses from Fish*

Note: Not strictly biological in nature due to the chemical reactions causing some of these toxins to be produced, some ascribe them to the biological contamination category while the FDA ascribes them to being chemical contaminants

Illness: Scombroid Poisoning

Toxin: Histamine

Fish Linked with the Toxin

- Tuna
- Bonito
- Mackerel
- MahiMahi

Prevention Measures

- Purchase fish from approved, reputable suppliers
- Prevent time-temperature abuse during storage and preparation

Illness: Ciguatera fish Poisoning

Toxin: Ciguatoxin (Ciguatera Toxin)

Fish Linked with the Toxin

- Predatory tropical reef fish:
- Barracuda
 - Grouper
 - Jacks
 - Snapper

Prevention Measures

- Purchase fish from approved, reputable suppliers

Chemical Contaminants

Sources:

- Certain types of kitchenware and equipment (items made from pewter, copper, zinc, and some types of painted and/or glazed pottery)
- The term galvanized is defined as zinc coated and therefore a toxic metal
- Cleaners, sanitizers, polishes, machine lubricants, and pesticides & Allergens
- Deodorizers, first-aid products, as well as health and beauty products (hand lotions, hairsprays, etc.)
- Carbonated beverage dispensers are installed improperly or not properly maintained

Symptoms:

- Can vary depending on chemical consumed
- Most illnesses occur within minutes
- Vomiting and diarrhea are typical

Prevention:

- Use food-grade utensils and equipment to prepare and store food
- Have a professional install and maintain beverage dispensers
- Only use chemicals approved for use in foodservice operations
- Purchase chemicals from approved, reputable suppliers
- Store chemicals away from prep areas, food-storage areas, and service areas
 - **Chemicals must be separated from food and food-contact surfaces by spacing and partitioning**
- Chemicals must NEVER be stored above food or food-contact surfaces
- Use chemicals for their intended use and follow manufacturer's directions
- Label them properly if they are transferred to new containers
- Make sure the manufacturers' labels on original chemical containers are readable
- Keep SDS (formerly MSDS) current, and make sure they are accessible to staff at all times

Physical Contaminants

Foreign objects accidentally introduced into food or should have been removed from food:

- Metal shavings from cans
- Staples from cartons
- Glass from broken light bulbs
- Blades from plastic or rubber scrapers
- Fingernails, hair, and bandages
- Dirt
- Jewelry
- Naturally occurring objects such as fruit pits and bones

The Deliberate Contamination of Food

- You also must take steps to stop people who are actually trying to contaminate it. This may include the groups listed on the slide.
- Some people may try to tamper with your food using biological, chemical, or physical contaminants. They may even use radioactive materials. Attacks might occur anywhere in the food supply chain. But they are usually focused on a specific food item, process, or business.
- The best way to protect food is to make it as difficult as possible for someone to tamper with it. For this reason, a food defense program should deal with the points in your operation where food is at risk.

- The FDA has created a tool that can be used to develop a food defense program. It is based on the acronym A.L.E.R.T. It can be used to help you identify the points in your operation where food is at risk.

ALERT

- Assure** Make sure that products you receive are from safe sources. Supervise product deliveries. Use approved suppliers who practice food defense. Request that delivery vehicles are locked or sealed.
- Look** Monitor the security of products in the facility. Limit access to prep and storage areas. Locking storage areas is one way to do this. Create a system for handling damaged products. Secure chemical storage locations. Train staff to spot food defense threats.
- Employees** Know who is in your facility. Limit access to prep and storage areas. Identify all visitors, and verify credentials. Conduct background checks on staff.
- Reports** Keep information related to food defense accessible: receiving logs, office files and documents, staff files, and random food defense self-inspections.
- Threat** Identify what you will do and who you will contact if there is suspicious activity or a threat at your operation. Hold any product you suspect to be contaminated. Contact your regulatory authority immediately. Maintain an emergency contact list.

Food Defense Training can be done here <http://www.fda.gov/food/fooddefense/>

Responding to a Foodborne-Illness Outbreak

Gather information

- Ask the person making the complaint for general contact information and to identify the food that was eaten. Also ask for a description of symptoms and when the person first got sick.

Notify authorities

- Contact the local regulatory authority if you suspect an outbreak.

Segregate product

- Set the suspected product aside if any remains. Include a label with Do Not Use and Do Not Discard on it

Document information

- Log information about the suspected product. This might include a product description, production date, and lot number. The sell-by date and pack size should also be recorded.

Identify staff

- Maintain a list of food handlers scheduled at the time of the suspected contamination. These staff members may be subject to an interview and sampling by investigators. They should also be interviewed immediately by management about their health status.

Cooperate with authorities

- Cooperate with regulatory authorities in the investigation. Provide appropriate documentation. You may be asked to provide temperature logs, HACCP documents, staff files, etc.

Review procedures

- Review and correct procedures that aren't working

Food allergen:

- A protein in a food or ingredient some people are sensitive to
- These proteins occur naturally
- When an enough of an allergen is eaten, an allergic reaction can occur

Common food allergens:

- Milk-
- Eggs
- Fish
- Peanuts
- Soy (Tofu)
- Wheat
- Shellfish, including lobster, shrimp, and crab
- Tree nuts, such as almonds, walnuts, and pecans

Symptoms of an allergic reaction include:

- Nausea
- Wheezing or shortness of breath
- Hives or itchy rashes
- Swelling of the body, including the face, eyes, hands, or feet
- Vomiting and/or diarrhea
- Abdominal pain

Allergic reactions:

- Symptoms can become serious quickly
- A severe reaction, called anaphylaxis, can lead to death

To protect guests with food allergies:

- Be able to fully describe menu items
- If you are unsure if an item is allergen free, urge the guest to order something else
- Ensure that cookware and utensils used to prepare the guests' food are allergen free

The Safe Foodhandler

How Foodhandlers Contaminate Food

- Scratching the scalp
- Running fingers through hair
- Wiping or touching the nose
- Wearing a dirty uniform
- Touching a pimple or open sore
- Coughing or sneezing into the hand
- Rubbing an ear
- Spitting in the establishment

Good personal hygiene includes:

- Maintaining personal cleanliness
- Following hygienic hand practices
- Avoiding unsanitary habits and actions
- Wearing proper work attire
- Maintaining good health – Reporting illnesses

Proper Hand-washing Procedure (Should take at least 20 seconds)

- 1) Wet hands with running water as hot as you can comfortably stand (at least 100°F/38°C)
- 2) Apply soap
- 3) Vigorously scrub hands and arms for 10-15 seconds Clean under fingernails and between fingers and up exposed portions of arms every time
- 4) Rinse thoroughly under warm running water
- 5) Dry hands and arms with a single-use paper towel or warm-air hand dryer. Use a paper towel to turn off the faucet and open the restroom door.

Hand Antiseptics

- Gels or liquids used to reduce the number of bacterial pathogens, but do not kill viruses
- Use ingredients that comply with CFR and FDA standards
- Should be used after hand-washing (if used in the establishment)
- Must never be used in place of hand-washing (Do not remove dirt and oils from hands)

Bare-Hand Contact with Ready-to-Eat Food

Some jurisdictions allow it but require written policies and procedures on:

- Employee health
- Hand-washing
- Other hygienic practices

Hand Maintenance

- Keep fingernails short and clean
- Do not wear false nails or nail polish
- Bandage cuts and cover bandages

When to Change Gloves

- As soon as they become soiled or torn
- Before beginning a different task
- At least every four hours during continual use and more often when necessary
- After handling raw meat and before handling cooked or ready-to-eat food

Proper Work Attire

Foodhandlers should:

- Wear a clean hat or other hair restraint
- Wear clean clothing daily
- Remove aprons when leaving food-preparation areas
- Remove jewelry from hands and arms
- Wear some appropriate, clean, and closed-toe shoes

Handling Employee Illnesses

- *Sore throat with fever* - Restrict the employee from working with or around food – OR – Exclude the employee from the establishment if you primarily serve a high-risk population
- *Vomiting, Diarrhea* - Exclude the employee from the establishment. Do not allow employees with vomiting or diarrhea to return to work unless they:
 - Have been symptom-free for 24 hours
 - Have a written release from a medical practitioner.
- *Jaundice* - Exclude the employee from the establishment for no less than 7 days. Do not allow employees with jaundice to return to work unless they have been released by a medical practitioner and approval has been received from the local regulatory authority.

- *The food handler has been diagnosed with a foodborne illness caused by: Salmonella Typhi; Nontyphoidal Salmonella; Shigella spp.; Shiga toxin-producing E. coli; Hepatitis A virus; Norovirus (The Big 6) – Exclude the employee from the establishment and notify the local regulatory agency. Work with the employee's medical practitioner and/or the local regulatory agency to determine when he or she can safely return to work.*

The Flow of Food

To keep food safe:

- Prevent cross-contamination
- Prevent time-temperature abuse

Preventing Cross-Contamination

Create physical barriers between food products:

- Assign specific equipment to each type of food
- Clean and sanitize work surfaces, equipment, and utensils after each task
- Prepare raw meat, fish, and poultry and ready-to-eat food at different
- Times (when using the same prep table)
- Purchase ingredients that require minimal preparation

Preventing Time-Temperature Abuse

This includes:

- Minimizing the time food spends in the temperature danger zone
- Determining the best way to monitor time and temperature
- Making thermometers available
- Regularly recording temperatures and the times they are taken

Temperature-Measuring Devices

The 3 major temperature-measuring devices are:

Bimetallic Stemmed Thermometer – Good for large or thick food

- 2 metals (copper/invar) inside stem that react differently to heat and expand or contract move pointer in indicator head
- Adjustment nut under display head to use to calibrate thermometer
- Dimple approximately 2/3 the way down stem to indicate start of sensing area (sensing area between dimple and end of stem)

Thermocouples and thermistors

- Immersion probe – for checking liquids
- Surface probe – checking flat surfaces
- Penetration probe – internal temperatures of thin food
- Air probe – checking air temperatures

Infrared (Laser) thermometers

- Used for measuring surface temperatures only (light does not penetrate below surface)
- Hold as close to surface you are measuring as possible
- Do not allow any obstacles to be between surface you are measuring and the Infrared Thermometer

Other lesser-known temperature-measuring devices are:

Time-temperature indicator (TTI)

- Monitors both time and temperature.
- The supplier attaches these tags to packaging.
- A color change appears in the window if the food has been time-temperature abused during shipment or storage.
- This color change is not reversible, so you know if the food has been abused.

Temperature-recording devices inside delivery trucks

- Some suppliers place temperature-recording devices inside their delivery trucks.
- These devices constantly check and record temperatures.
- You can check the device during receiving to make sure food was at safe temperatures while it was being shipped.

A maximum registering thermometer or maximum registering tape is one type.

- This thermometer indicates the highest temperature reached during use
- Used where temperature readings cannot be continuously observed.
- It works well for cold food buffets where you don't care what the temperature only that the foods have not exceeded 70°F
- Also for checking final rinse temperatures {180°F (82°C)} of dishwashing machines.

Calibrating Thermometers (Ice Point method)

- 1) Fill a large container with crushed ice and water
- 2) Stir the ice slurry until temperature between water and crushed ice has reached equilibrium
- 3) Submerge the thermometer stem or probe in the water for thirty seconds
- 4) Hold the calibration nut and rotate the thermometer head until it reads 32°F (0°C)

Purchasing and Receiving

Suppliers

Choose suppliers who get product from approved sources

Approved sources:

- Have been inspected
- Are in compliance with applicable local, state and federal law

Receiving Criteria for Meat

Look for a bright red color, firm flesh, good smell and a circular stamp on the box (USDA inspection) at or below 41°F (5°C)

Receiving Criteria for Poultry

Look for good smell, at or below 41°F (5°C). Avoid darkened wing tips and soft and sticky flesh.

Receiving Criteria for Fish

Delivered and Stored in crushed ice, Needs to have Bright gills that are moist and red with scales firmly attached. Eyes clear and bulging, Flesh firm and elastic. No worms and diseases or tumors. At or below 41F (5°C)

Receiving Criteria for Shellfish

Shellfish must be alive when delivered. No strong odor. They must be kept in original container. Received at or below 45°F (7°C)

Receiving Criteria for Shell Eggs

At or below an air temperature of 45°F (7°C), Damaged and dirty eggs should be rejected

Receiving Criteria for Milk

At or below 45°F (7°C), Pasteurized and Grade A. Check Expiration Dates. Check for any signs of contamination.

Receiving Criteria for Fresh Produce

Check for contamination. All produce must be washed in potable water before serving.

Receiving Criteria for Frozen Processed Food

Check for time and temperature abuse. Should be frozen solid with no signs of thawing and refreezing, like fluids in containers or ice crystals in packaging. Store in freezer until ready for use.

Receiving Criteria for Canned Food

BOTULISM CAN OCCUR IN CANNED OR VACUUM PACKED FOODS, AND IT IS EXTREMELY DANGEROUS. Check for swollen cans, leakage, broken seals, dents along seams, and rust or missing labels. Reject cans if these conditions are detected.

Receiving Criteria for Dry Food

Check they are in good condition. Look for holes or tears.

General Storage

Label Food

Time Temperature Control for Safety (TCS), ready-to-eat food prepared on-site must contain a label that includes:

- The name of the food (*A common name that describes the food correctly.*)
- The date by which it should be sold, consumed or discarded

Rotate products to ensure the oldest inventory is used first. One way to rotate products is to follow FIFO:

- Identify the use-by or expiration date of products
- Shelve products with the earliest dates in front of those with later dates
- Use products stored in front first
- Discard any foods with expired use-by or expiration dates

Discard food that has passed the manufacturer's expiration date. TCS, ready-to-eat food that was prepared in-house:

- Can be stored for 7 days at 41°F (5°C) or lower
- Must have a date label if to be stored longer than 24 hours.
- Must be thrown out after 7 days

Store food in designated storage areas.

Do not store food:

- In Restrooms
- In janitor closets
- In storage rooms
- Under stairways or pipes
- In locker rooms
- In furnace, mechanical or A/C rooms
- In electrical or phone rooms
- Near chemicals or cleaning supplies

Refrigerated Storage

- Used to hold TCS food at an internal temperature of 41°F (5°C) or lower
- Slows the growth of microorganisms

Monitor food temperature regularly

- Randomly sample the internal temperature of stored food with a calibrated thermometer

Never place hot food in refrigerators

- This can warm the interior and put other food into the temperature danger zone

Store raw meat, poultry, and fish:

- Separately from cooked and ready-to-eat food
- OR
- Below cooked and ready-to-eat food

Frozen Storage Guidelines

When storing food in freezers:

- Keep freezers at a temperature that will keep products frozen solid
- Check freezer temperatures regularly
- Place deliveries in freezers as soon as they have been inspected
- Clearly label frozen food that was prepared on site

Dry Storage Guidelines

Keep storerooms:

- Cool (**50°F to 70°F** [10°C to 21°C])
- Dry (50% to 60% humidity)
- Well ventilated
- Clean

When storing food in dry storage keep it:

- Away from walls
- Out of direct sunlight
- At least 6" (15 cm) off the floor

Storing Meat

When storing fresh meat:

- Store it at an internal temperature of 41°F (5°C) or lower
- Wrap it in airtight, moisture-proof material
- OR
- Place it in a clean, sanitized container able to be sealed

Storing Poultry

When storing fresh poultry:

- Store it at an internal temperature of 41°F (5°C) or lower
- Store ice-packed product, as is, in self-draining containers
 - Change the ice often
 - Clean and sanitize the container regularly

Storing Fish

When storing fresh fish:

- Store it at an internal temperature of 41°F (5°C) or lower
- Store ice-packed product, as is, in self-draining containers
- Keep fillets and steaks in original packaging
- Store frozen fish in moisture-proof wrapping

Storing Eggs and Egg Products

Shell Eggs:

- Store at an air temperature of 41°F (5°C) or lower
- Keep eggs in refrigerated storage until used
- Use eggs within 4-5 weeks of packing date

Liquid Eggs:

- Store according to manufacturer's recommendations
- Keep in refrigerated storage until used

Dried Eggs:

- Store product in a dry, cool storeroom

Storing Shellfish

When storing shellfish:

- Store alive at an air temperature of 41°F (5°C) or lower
- Store in original containers
- Keep shellstock tags on file for 90 days from the sale or serving of the last shell fish in the container
- Obtain a variance if storing Molluscan shellfish in a display tank prior to service

Storing Dairy

When storing dairy:

- Store fresh at 41°F (5°C) or lower
- Follow FIFO
- Discard product that has passed use-by or expiration dates

Storing Produce

When storing fresh produce:

- Storage temperatures will vary by product
- Product packed on ice can be stored that way
- Do not wash product prior to storage
- When soaking or storing product in standing water or an ice water slurry:
 - Do not mix different items
 - Do not mix multiple batches of the same item

Food Preparation

The Four Acceptable Methods for Thawing Food

- In a refrigerator, at 41°F (5°C) or lower
- Submerged under running potable water, at a temperature of 70°F (21°C) or lower
- In a microwave oven, if the food will be cooked immediately after thawing
- As part of the cooking process

When preparing salads containing TCS ingredients:

- Make sure leftover ingredients (i.e., pasta, chicken, potatoes) have been handled safely by ensuring they were:
 - Cooked, held, and cooled properly
 - Stored for less than 7 days
- Prepare product in small batches
- Refrigerate ingredients until the point they are needed
- Chill all ingredients and utensils prior to using them

When preparing eggs and egg mixtures:

- Handle pooled eggs (if allowed) with care:
 - Cook promptly after mixing or store at 41°F (5°C) or lower
 - Clean and sanitize containers between batches
- Use pasteurized shell eggs or egg products when preparing dishes requiring little or no cooking (i.e., hollandaise sauce)
- Promptly clean and sanitize equipment and utensils used to prepare eggs

When preparing eggs for high risk populations:

- Pasteurized eggs or egg products must be used when dishes will be served raw or undercooked
- Unpasteurized shell eggs may be used if the dish will be cooked all the way through (i.e., omelets, cakes)
- If shell eggs will be pooled for a recipe they must be pasteurized

When preparing produce:

- Prevent contact with surfaces exposed to raw meat or poultry
- Prepare produce away from raw meat, poultry, eggs, and cooked and ready-to-eat food
- Clean and sanitize the workspace and all utensils used during preparation
- Wash it thoroughly under running water before cutting, cooking, or combining with other ingredients
- Use water slightly warmer than the temperature of the produce
- Pull leafy greens apart and rinse thoroughly
- Clean and sanitize surfaces used to prepare produce
- When soaking or storing produce in standing water or an ice water slurry do not mix:
 - Different items
 - Multiple batches of the same item
- Refrigerate and hold cut melons at 41°F (5°C) or lower
- Do not add sulfites
- Do not serve raw seed sprouts to high risk populations

Cooking

Food	Minimum Internal Cooking Temperature	Length of Time at this Temperature
Poultry: (including whole or ground chicken, turkey, and duck)	165°F (74°C)	15 seconds
Ground Meat (including beef, pork, other meat)	155°F (68°C)	15 seconds
Injected Meat	155°F (68°C)	15 seconds
Mechanically Tenderized Meat	155°F (68°C)	15 seconds
Ground, chopped, minced fish	155°F (68°C)	15 seconds
Eggs that will be hot-held	155°F (68°C)	15 seconds
Pork, Beef, Veal, Lamb	Steaks/Chops: 145°F (63°C)	15 seconds
Pork, Beef, Veal, Lamb	Roasts: 145°F (63°C)	4 minutes
Fish and Shellfish	145°F (63°C)	15 seconds
Eggs for immediate service	145°F (63°C)	15 seconds
Commercially processed, ready-to-eat food that will be hot-held for service (breaded cheese sticks, deep fried vegetables, etc.)	135°F (57°C)	15 seconds

Stuffing made with TCS foods (Stuffed meat, fish, poultry, and pasta)

- Minimum Internal Cooking Temperature: 165°F (74°C) for 15 seconds
- When including previously cooked, TCS ingredients in the dish: Cook dish to a minimum internal temperature of: 165°F (74°C) for 15 seconds
- When including raw TCS ingredients in the dish: Cook them to their required minimum internal temperature

TCS food cooked in a microwave: (eggs, poultry, fish, and meat)

- Minimum Internal Cooking Temperature: 165°F (74°C)

When cooking food in a microwave:

- Cover it to prevent the surface from drying out
- Rotate or stir it halfway through the cooking process to distribute the heat more evenly
- Let it stand for at least 2 minutes after cooking to let the product temperature equalize
- Check the temperature in several places to ensure that it is cooked through

Cooling

Cool TCS food from:

- 135°F and above to 70°F (57°C to 21°C) within 2 hours (Can never exceed 2 hours)

And then from

- 70°F to 41°F (21°C to 5°C) or lower in the next 4 hours (Total cannot exceed 6 hours)

Since cooling time occurs in phases if the first phase cooling is less than 2 hours, the difference between that time and 2 hours can be shifted to the second phase. For example if the TCS food is cooled from 135°F and above to 70°F (57°C to 21°C) in 1-1/2 hours the second phase can be extended to 4-1/2 hours, as long as total time does not exceed 6 hours

Before cooling food, start by **reducing its size:**

- Cut larger items into smaller pieces
- Divide large containers of food into smaller containers or shallow pans

Safe methods for cooling food:

- Place it in an ice-water bath
 - Place containers into a sink or large pot filled with ice water
 - Stir the food frequently
- Stir it with an ice paddle

Note: Food cools faster when placed in an ice-water bath and stirred with an ice paddle (Combining steps 1 and 2 above)

- Place it in a blast chiller (Blast chillers blast cold air across food at high speeds to remove heat) They are useful for cooling large items
- Place it in a tumble chiller (Tumble chillers tumble bags of hot food in cold water). They are useful for cooling thick food

Reheating

Food reheated for immediate service:

- Can be served at any temperature if it was properly cooked and cooled

TCS food reheated for hot holding:

- Must be reheated to an internal temperature of **165°F (74°C) for 15 seconds** within 2 hours

Discard it if it has not reached this temperature within 2 hours

Service

When holding **hot TCS** food:

- Check internal temperatures using a thermometer
- Check temperatures at least every four hours
- Discard food not at **135°(57°C) or higher**
- As an alternative, check the temperature every 2 hours to leave time for corrective action
- Discard it after a predetermined amount of time
- Protect it from contaminants with covers/sneeze guards
- Prepare it in small batches so it will be used faster
- Hold it at an internal temperature of **135°F (57°C) or higher**
- Only use equipment that can keep it at the proper temperature
- Never use the hot-holding equipment to reheat it, unless it was designed for that purpose
- Stir it at regular intervals to distribute heat evenly

When holding **cold TCS** food:

- Hold it at an internal temperature of **41°F (5°C) or lower**
- Only use equipment that can keep it at the proper temperature
- Do not store it directly on ice
 - Whole fruit and vegetables and raw, cut vegetables are the only exceptions
 - Place all other food in pans or on plates first

Cold food can be held without temperature control for up to 6 hours if:

- It was held at 41°F (5°C) or lower prior to removing it from refrigeration.
- It does not exceed 70°F (21°C) during the six hours.
- It contains a label specifying:
 - The time it was removed from refrigeration
 - The time it must be thrown out
- It is sold, served, or discarded within six hours

Hot food can be held without temperature control for up to 4 hours if:

- It was held at 135°F (57°C) or higher prior to removing it from temperature control
- It contains a label specifying when the item must be thrown out
- It is sold, served, or discarded within four hours

To prevent contamination when serving food:

- Use clean and sanitized utensils for serving
- Use separate utensils for each type of food
- Clean and sanitize utensils after each task
- Use serving utensils with long handles to keep hands away from food
- Practice good personal hygiene
- Store serving utensils properly
 - Store them in the food, with the handle extended above the rim of the container
 - Store them on a clean, sanitized food-contact surface
- Minimize bare-hand contact with cooked or ready-to-eat food
 - Handle food with tongs, deli sheets, or gloves
 - Bare hand contact is allowed in some jurisdictions (check requirements **California repelled the glove law in June 2014**)

Never re-serve:

- Menu items returned by one customer to another
- Plate garnishes
- Uncovered condiments
- Uneaten bread or rolls (or re-use the towel or cloth in the basket rolls were served in for another customer without cleaning)

In general only unopened, prepackaged food can be re-served:

- Condiment packets
- Sealed containers of syrup, honey or jelly, etc.
- Wrapped crackers or breadsticks in good condition

To keep food safe on buffets and food bars:

- Install sneeze guards or food shields
 - Must be located 14" (36cm) above the food counter
 - Must extend 7" (18cm) beyond the food
- Identify all food items
 - Label all containers
 - Place salad dressing names on ladle handles

Food Safety Management Systems

A Food Safety Management System is:

- A group of programs, procedures, and measures for preventing foodborne illness
- Designed to actively control risks and hazards throughout the flow of food

Two systematic and proactive approaches

- Active managerial control
- Hazard Analysis Critical Control Point (HACCP)

These must be in place for a food safety management system to be effective

- Personal hygiene program
- Supplier selection and specification programs
- Sanitation and pest control programs
- Facility design and equipment maintenance programs
- Food safety training programs

Active Managerial Control

Focuses on controlling the CDC's 5 most common risk factors responsible for foodborne illness:

- Purchasing food from unsafe sources
- Failing to cook food adequately
- Holding food at improper temperatures
- Using contaminated equipment
- Practicing poor personal hygiene

Steps for using active managerial control:

- 1) Consider the five risk factors as they apply throughout the flow of food and identify any issues that could impact food safety.
- 2) Develop policies and procedures that address the issues that were identified
 - Consider input from staff
 - Provide training on these policies and procedures if necessary

- 3) Regularly monitor the policies and procedures that have been developed
 - This step can help determine if the policies and procedures are being followed
 - If not, it may be necessary to revise them, create new ones, or retrain employees
- 4) Verify that the policies and procedures you have established are actually controlling the risk factors
 - Use feedback from internal and external sources to adjust the policies and procedures for continuous improvement
 - Internal sources: records, temperature logs, and self-inspections
 - External sources: health inspection reports, customer comments, and quality assurance audits

HACCP: Philosophy

If significant biological, chemical, or physical hazards are identified at specific points within a product's flow through the operation, they can be:

- Prevented
- Eliminated
- Reduced to safe levels

To be effective, a HACCP system must be based on a written plan:

- It must be specific to each facility's menu, customers, equipment, processes, and operations
- A plan that works for one establishment may not work for another

HACCP: The 7 HACCP Principles

The Seven HACCP Principles

- 1) Conduct a hazard analysis
- 2) Determine critical control points (CCP's)
- 3) Establish critical limits
- 4) Establish monitoring procedures
- 5) Identify corrective actions
- 6) Verify that the system works
- 7) Establish procedures for record keeping and documentation

A HACCP Plan is required if an establishment:

- Smokes or cures food as a method of food preservation
- Uses food additives as a method of food preservation
- Packages food using a reduced-oxygen packaging (ROP) method
- Offers live, Molluscan shellfish from a display tank
- Custom-processes animals for personal use
- Packages unpasteurized juice for sale to the consumer without a warning label
- Packages pasteurized juice for later sale
- Sprouts beans or seeds

Building a Successful Crisis-Management Program

Must contain a written plan that focuses on: preparation, response & recovery. For each of these parts, the plan must identify the resources needed and the procedures to be followed.

Sanitary Facilities and Equipment

Coving:

A curved, sealed edge placed between the floor and wall

- It eliminates sharp corners or gaps that would be impossible to clean
- It must adhere tightly to the wall to:
 - Eliminate hiding places for pests
 - Prevent moisture from deteriorating the wall

Hand-washing stations:

Must be conveniently located and are required in:

- Restrooms
- Food-preparation areas
- Service areas
- Dishwashing areas

Hand-washing stations must be equipped with:

- Hot and cold running water (100°F/38°C minimum for washing hands.)
- Liquid or powdered soap (Bar soap may become a health hazard.)
- A means to dry hands (Single use paper towels would be a good choice.)
- A waste container
- Signage indicating employees must wash hands before returning to food prep or work areas

Purchase equipment with food-contact surfaces that are:

- Safe and durable
- Corrosion resistant
- Nonabsorbent
- Sufficient in weight and thickness to withstand repeated cleaning
- Smooth and easy to clean
- Resistant to pitting, chipping, scratching, and decomposition
 - Example: Cutting Boards
 - Hard Plastics, Acrylics and Hard Woods make good cutting boards because they are resistant to damage
 - Soft Woods like Pine make poor cutting boards because they are easily penetrated by knives and sharp utensils creating groves that could harbor bacteria

Look for the following marks when purchasing equipment:

- NSF International mark: Equipment has been evaluated, tested, and certified as meeting international commercial food equipment standards
- Underwriters Laboratory (UL) marks: Equipment is in compliance with NSF standards or UL's own environmental and public health (EPH) standards

Stationary equipment should be:

- Mounted on legs at least 6 inches (15 centimeters) off the floor OR Sealed to a masonry base (where no dirt, food or pests could enter)

Stationary tabletop equipment should be:

- Mounted on legs with a minimum **4-inch** (10 centimeter) clearance between the equipment base and tabletop OR the equipment should be tiltable OR sealed to the countertop with a food-grade sealant where no dirt, food or pests could enter

Safe water (potable water) is supplied via water mains or portable water delivery vehicles or systems that are regularly tested and inspected.

Water Supply: Interruption

If the water supply is interrupted:

- Use bottled water
- Use boiled water for hand-washing and essential cleaning
- Boil water (if allowed)
- Consider using single-use items to minimize dishwashing
- Purchase ice

Plumbing: Cross-Connections and Backflow

Cross Connection

- Physical link through which contaminants from drain's, sewers, and other wastewater sources can enter the potable water supply



Backflow

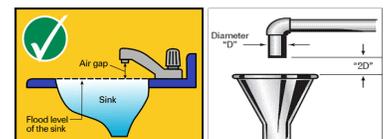
- Reverse flow of contaminants through a cross-connection into the potable water supply

Back siphonage

- High water usage in another area creates a vacuum that siphons dirty water into the clean water system when a cross-connection exists

Backflow Prevention Methods

- Vacuum Breaker
- Air Gap (The only 100% sure way to prevent backflow)



Sewage:

A backup of raw sewage is cause for:

- Immediate closure
- Correction of the problem
- Thorough cleaning

Lighting:

To prevent lighting from contaminating food, use:

- Shatter-resistant light bulbs
- Protective covers made of metal mesh or plastic
- Shields for heat lamps

Good lighting provides a safer environment for employees handling food. Lighting is measured in foot-candles or lux. There are minimum requirements for lighting intensity in various areas of operation.

- 10 foot candles (109 lux) – Walk in coolers, dry storage areas (wherever you need light but do not want to generate heat) and dining rooms (minimum light for cleaning)
- 50 foot candles (540 lux) – Prep Areas (As bright a possible without concern for heat generated)
- 20 foot candles (215 lux) – Hand-washing, buffet or salad bars, restrooms, reach in coolers

Garbage:

- Should be removed from food-preparation areas as quickly as possible to prevent pests and contamination
- Should not be carried above or across food-preparation areas.

Cleaning and Sanitizing

Cleaning

- Process of removing food and other types of soil from a surface

Rinsing

- Process of removing soapy water, food, dirt and oils from a surface with clean water

Sanitizing

- Process of reducing the number of pathogens on a clean surface to safe levels
- Surfaces must first be cleaned and rinsed before being sanitized

Food-contact surfaces must be washed, rinsed, and sanitized:

- After each use
- Anytime you begin working with another type of food
- After a task has been interrupted and the items may have been contaminated
- At 4-hour intervals if the items are in constant use

Cleaning agents must be:

- Safe for employee use
- Stable and noncorrosive
- When using them:
 - Follow manufacturer's instructions carefully
 - Never combine cleaners or attempt to make up cleaning agents
 - Do not substitute one type of detergent for another unless the intended use is stated clearly on the label

Sanitizing

Heat

- The water in the third compartment of a three compartment sink must be at least 171F°(77°C)
- Immerse the item for 30 seconds
- Effective hot water sanitization occurs when the surface temperatures of utensils meet or exceed the required 160°F (71°C).

OR

Chemicals

- Chlorine
- Iodine
- Quats

Food-contact surfaces can be sanitized by:

- Immersing them in a specific concentration of sanitizing solution for a specific amount of time

OR

- Rinsing, swabbing or spraying them with a specific concentration of sanitizing solution

Factors affecting sanitizer effectiveness

Concentration

- Concentration must be checked frequently with a test kit (A different type of test kit is required for each type of sanitizer)
 - Low Concentrations: May fail to sanitize objects
 - High Concentrations: May be unsafe, leave an odor or bad taste, corrode metals
- Change the solution when it is dirty or when the concentration has dropped below the required level

Temperature

- Follow the manufacturer's recommendations for the proper temperature (Temperature can affect the effectiveness of a chemical sanitizer)

Contact Time

- The sanitizer must make contact with the object for a specific amount of time
- Minimum times differ for each sanitizer

Other factors

2 other things that can affect the effectiveness of sanitizers are:

- Hard water
- PH level

High-Temperature Machines

- Temperature of the final sanitizing rinse must be at least 180°F (82°C)
- For stationary rack, single-temperature machines temperature of the final sanitizing rinse must be at least 165°F (74°C)
- Effective hot water sanitization occurs when the surface temperatures of utensils meet or exceed the required 160°F (71°C).

Chemical-Sanitizing Machines

Follow temperature guidelines provided by the manufacturer but always less than 165°F (74°C) which is the lowest temperature at which heat is used to sanitize

Steps for cleaning and sanitizing dishes and utensils by hand in a three compartment sink

- Rinse, scrape or soak items to remove large particles, globules and foreign objects
- Wash in soapy warm water 110°F (43°C) or higher
- Rinse
- Sanitize
- Air Dry

Storing Utensils, Tableware, and Equipment

When storing clean and sanitized tableware and equipment:

- Store it at **least 6"** (15cm) off the floor
- Clean and sanitize drawers and shelves before items are stored
- Clean and sanitize trays and carts used to carry them
- Store glasses and cups upside down
- Store flatware and utensils with handles up
- Cover equipment food-contact surfaces until ready for use

Storing Cleaning Tools and Supplies

Cleaning tools and chemicals should be placed in a storage area away from food and food-preparation areas. The storage area should provide:

- A utility sink for filling buckets and washing cleaning tools
- A floor drain for dumping dirty water
- Hooks for hanging mops, brooms, and brushes to allow them to air-dry

Never dump buckets or pails of dirty water into toilets or urinals. If the bucket or pail comes into contact with the contaminated surface of a toilet or urinal the pathogens from those surfaces may contaminate the bucket, which may then contaminate the hands, which may contaminate other cleaning tools and surfaces.

Never clean mops, buckets or other cleaning tools in sinks used for food prep, dish washing or hand washing

Master Cleaning Schedule

Evaluate your cleaning needs by walking through your facility and looking at how the cleaning is being done. Then develop a master cleaning schedule that contains the following information:

- What should be cleaned
- Who should clean it
- When it should be cleaned
- How it should be cleaned

Once the master cleaning program has been introduced to your employees it will need to be monitored by:

- Supervising daily cleaning routines
- Check all cleaning tasks against the master cleaning schedule
- Change the master schedule as needed for any changes in menu procedures, or equipment.
- Ask staff during meetings for input on the program

When cleaning the premises:

- Clean nonfood-contact surfaces regularly
 - Includes floors, ceilings, walls, equipment exteriors, etc.
 - Prevents dust, dirt, food residue and other debris from building up

Cleaning up after people who get sick:

- Diarrhea and vomit in the operation must be cleaned up the correct way
 - It can carry **Norovirus**, which is highly contagious
- Correct cleanup can prevent food from becoming contaminated and keep others from getting sick

Consider the following when developing a plan for cleaning up vomit and diarrhea:

- How you will contain liquid and airborne substances, and remove them from the operation
- How you will clean, sanitize, and disinfect surfaces
- When to throw out food that may have been contaminated
- What equipment is needed to clean up these substances, and how it will be cleaned and disinfected after use
- When a food handler must wear personal protective equipment

Develop a plan for cleaning up vomit and diarrhea:

- How staff will be notified of the correct procedures for containing, cleaning, and disinfecting these substances
- How to segregate contaminated areas from other areas
- When staff must be restricted from working with or around food, or excluded from working in the operation
- How sick customers will be quickly removed from the operation
- How the cleaning plan will be implemented

Using Hazardous Materials

Chemicals

- Only purchase those approved for use in a restaurant or foodservice establishment
- Store them in their original container away from food and food-preparation areas
- When transferring them to a new container label it with:
 - A common name for the chemical:
 - Cleaner
 - Sanitizer
 - De-Greaser
 - Heavy Duty De-Greaser
 - De-Limer (Delimer)
- OSHA requires that each operation keep SDS (formerly MSDS) for each chemical

Integrated Pest Management

An Integrated Pest Management (IPM) program:

- Uses prevention measures to keep pests from entering the establishment
- Uses control measures to eliminate any pests that get into the establishment
- Will be successful if you work closely with a licensed pest control operator (PCO)

The Three Rules of Integrated Pest Management

- Deny pests access to the establishment
- Deny pests food, water, and shelter in the establishment
- Work with a licensed Pest Control Operator (PCO) to eliminate pests that do enter

To keep pests from entering with deliveries:

- Use reputable suppliers
- Check deliveries before they enter the establishment and refuse shipments if you find pests or signs of infestation (egg cases, body parts, feces, tracks, gnawing on packaging, etc.)

To keep pests from entering through openings in the building:

- Screen windows and vents
- Install self-closing devices, door sweeps, and air curtains on doors
- Keep exterior openings closed tightly
- Fill holes around pipes (not just duct tape, but construction worthy materials, like plaster or concrete)
- Cover drains with grates
- Seal cracks in floors, walls, and around equipment

To deny pests food and shelter:

- Dispose of garbage quickly
- Clean up spills around containers immediately
- Keep containers clean and tightly covered
- Store recyclables properly
 - Keep recyclables in pest-proof containers
 - Keep containers as far away from the building as regulations allow
- Store food and supplies quickly and properly
 - Keep them away from walls and at least 6" (15 cm) off the floor
 - Rotate products so pests cannot settle and breed
- Clean the establishment thoroughly
- Clean up food and beverage spills immediately
- Clean break rooms after use
- Keep cleaning tools and supplies clean and dry

If pesticides will be stored on the premises:

- Keep them in their original containers
- Lock them in cabinets away from areas where food is prepared and stored
- Store aerosol or pressurized spray cans in a cool place
- Dispose of them as per local regulations
- Keep corresponding SDS (formerly MSDS) on the premises

Food Safety Regulation and Standards

An inspector may close an establishment when there is:

- A significant lack of refrigeration
- A backup of sewage into the establishment
- An emergency, such as a fire or flood
- A significant pest infestation
- A long interruption of electrical or water service
- Clear evidence of a foodborne illness outbreak related to the establishment

Well-managed establishments:

- Perform continuous self-inspections
- Consider regular inspections only a supplement to self-inspections

The benefits of self-inspections:

- Safer food
- Improved food quality
- Higher inspection scores
- A cleaner environment for customers